Abstracts for the 8th World Congress on Aging and Physical Activity

A Celebration of Diversity and Inclusion in Active Ageing

Welcomes and Committees ................................................................. S1

Monday 13th August 2012
Plenary Keynotes ................................................................................ S5

Tuesday 14th August 2012. Day Theme: Well-Being, Quality of Life, and Cognitive Function
Plenary Keynotes ................................................................................ S7
Symposia ............................................................................................. S8
Oral Presentations ............................................................................... S28
Practical Workshops .......................................................................... S45
Meet-the-Expert Sessions ................................................................. S50
Posters ............................................................................................... S52

Wednesday 15th August 2012. Day Theme: Falls and Fractures/Balance and Bone Health
Plenary Keynotes ................................................................................ S102
Symposia ............................................................................................ S103

(continued)
Thursday 16th August 2012. Day Theme: Neurological and Musculoskeletal Conditions

Plenary Keynotes ................................................................. S202
Symposia ............................................................................. S203
Oral Presentations ............................................................. S216
Practical Workshops .......................................................... S257
Meet-the-Expert Sessions .................................................. S261
Posters ................................................................................ S262

Friday 17th August 2012. Day Theme: Cardiovascular and Respiratory Conditions

Plenary Keynotes ................................................................. S292
Symposia ............................................................................. S293
Oral Presentations ............................................................. S307
Meet-the-Expert Sessions .................................................. S322
Practical Workshops .......................................................... S323
Posters ................................................................................ S327

Author Index ...................................................................... S354
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Welcomes

On behalf of the Local Organising Committee and the many researchers and practitioners involved in the field of active ageing from across the UK, we wish to extend a warm welcome to all delegates at the 8th World Congress on Active Ageing in Glasgow. This event will not only highlight the latest in research and best practice across the age span but also provide a spotlight on the needs of an often excluded but growing population worldwide, the oldest old.

Choosing from over 570 submitted abstracts from 45 countries worldwide and using a mixture of both 1-day and cross-Congress themes, we hope the event will have something for everyone. Our programme includes 10 keynote presentations, 63 symposia with 275 oral presentations, 35 practical workshops, 11 meet-the-expert sessions, and 247 posters.

This professional programme will be complemented by the Senior Pass, designed to ensure that older people from Scotland have the opportunity to attend the Congress and are included in the programme. We hope to promote interaction and learning between the older people, their carers, and the many scientists, researchers, policy makers, and practitioners involved in active ageing. They, and you, will have the chance to sample a variety of different “taster” activity sessions; have a Functional Fitness Test and a discussion about exercise opportunities that meet individual interests and needs; try a selection of hearing, vision, and IQ tests; and attend meet-the-expert round-table discussions. We also have a full activity programme for delegates, including early morning Tai Chi, guided walking tours, cycling, and gym opportunities.

The content of the submissions was unsurpassed. Throughout the Congress and this Special Collection of Abstracts from the Congress you will notice the interchangeable spelling of ageing and aging. We have deliberately left the spelling as the authors wrote it—may we enjoy many other trading and exchanging of words at the Congress.

For those of you who cannot attend, we hope this supplement to JAPA will give you a flavour of the event, though there will be many other meet-the-expert sessions and practical sessions still to be organised at the time of this printing. For those of you attending, we hope that you leave with new learning and insight, renewed motivation and energy, and new friends and many happy memories.

Dawn Skelton
Chair 2012 Scientific Committee
& Co-Chair Local Organising Committee, Glasgow 2012
Glasgow Caledonian University

Bob Laventure
Co-Chair Local Organising Committee, Glasgow 2012
British Heart Foundation National Centre for Physical Activity and Health
Loughborough University
The Glasgow World Congress on Active Ageing marks the eighth time that scholars from all corners of the globe have come together to exchange ideas, share research findings, and explore new programs and practices in the area of healthy ageing. On behalf of the worldwide network of scholars and practitioners working in the area of active ageing, we would like to extend our congratulations and best wishes to the organizers of the 2012 World Congress.

A primary goal of the past and present congresses is to share and promote research, clinical practice, and public policy initiatives in the area of ageing and physical activity. The academic community organizes a World Congress approximately every 4 years. Previous congresses have been held in West Point, NY, USA (1984); Budapest, Hungary (1988); Jyväskylä, Finland (1992); Heidelberg, Germany (1996); Orlando, FL, USA (1999); London, Ontario, Canada (2004); and Tsukuba, Japan (2008).

As representatives of the organizing committees of the previous three World Congresses on Active Ageing, we wish to thank the Glasgow 2012 organizing committee for their hard work in preparing for this prestigious event. We are confident that the theme selected for the conference, “A celebration of diversity and inclusion in active ageing,” will make a substantive contribution to our understanding of the importance of active and healthy ageing for quality of life of older persons all over the world.

The 8th World Congress on Active Ageing in Glasgow, Scotland, is an opportunity for the world community to share the latest research findings in the area of ageing and physical activity. It introduces cutting-edge methods on developing, implementing, and evaluating active ageing programs for older adults. We encourage all researchers, practitioners, older adults, and the general public who are interested in promoting active and healthy lifestyles for older adults to attend the meeting.

We look forward to seeing you all again this August 2012 in Glasgow.

Kiyoji Tanaka, Chair 2008 Congress, Tsukuba, Iberaki, Japan
Gareth Jones, Chair 2004 Congress, London, Ontario, Canada
Wojtek Chodzko-Zajko, Chair 1999 Congress, Orlando, Florida, USA

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A huge thank you to the Scientific Programme Committee, the Knowledge Transfer Committee, the Local Organising Committee, Congrex UK Ltd, and Dr. Senay Aydin for their help, enthusiasm, and expertise.

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Monday 13th August 2012

Plenary Keynotes

PUBLIC HEALTH GUIDELINES FOR PHYSICAL ACTIVITY IN OLDER PEOPLE
Buchner, David
Department of Kinesiology & Community Health, University of Illinois at Urbana Champaign, United States.

Since the 7th World Congress on Aging and Physical Activity in 2008, new or updated physical activity (PA) guidelines have been issued by the World Health Organization, USA, UK, and Canada. Each of these guidelines provide recommendations specific for older adults, on the types and amounts of activity that reduce risk of chronic disease and provide health benefits. They demonstrate there is strong scientific evidence for the health benefits of physical activity in older people. The objectives of this presentation are: (1) To provide a brief history of PA guidelines; (2) to provide examples of health benefits of PA of particular importance to older people; (3) to discuss key PA guidelines for older adults and how they differ from previous guidelines; and (4) to comment on gaps in knowledge and future directions for PA guidelines. Key points of the presentation include the following. It is of great public health importance for low active adults to achieve medium levels of activity, and to avoid inactivity. While there are major health benefits of aerobic activity, muscle-strengthening activity and balance training have important health benefits in older adults; these benefits include opposing sarcopenia and reducing risk of fall injuries. The guidelines affirm, as evidence-based, the longstanding advice that risk of activity-related injuries is reduced by increasing physical activity gradually over time. They also affirm that walking has major health benefits and relatively low risk of injury for older adults.

LONGEVITY, PHYSICAL ACTIVITY AND EXERCISE
Kirkwood, Tom
Institute for Ageing and Health, Newcastle University, UK.

Life expectancy in developed nations is increasing by 5 hours a day, and in many developing countries even faster as they catch up, presenting globally a profound challenge for the organization of society. Whereas the increase was originally driven by success in reducing deaths in the early and middle years of life, recent decades have seen the emergence of an entirely new phenomenon – the declining death rates of people who are old already. Evidence from many lines of research confirms that ageing is more malleable than was previously thought, since it arises not from a strict genetic programme but from the gradual accumulation of damage in cells and tissues of the body, which can be modulated in turn by many factors including nutrition, lifestyle and environment. Exercise is emerging as one of the
most potent factors influencing health in old age. In some ways this is paradoxical, because
eexercise stresses the body, potentially causing more rather than less damage. However the
potency of exercise as a beneficial factor arises from the multiple ways in which it stimulates
the cellular maintenance systems to function at a higher level. Exercise works, but there is
much yet to learn about its full potential.
PHYSICAL ACTIVITY, WELLBEING, AND QUALITY OF LIFE THROUGH THE LIFESPAN

Spirduso, Waneen

Department of Kinesiology and Health Education, University of Texas, Austin, United States.

From birth to death physical activity (PA) pervades every aspect of our lives, from influencing the way we think, learn, love, express ourselves, choose our mates and friends, interact with our children, carry out our jobs, and recover from life-changing accidents and disease, to the way we accept the challenges of aging and ultimately, death. In early life PA comes easily, changes result in increased abilities, and enhanced well-being. Adult age-related physical changes require adaptation, both physically and mentally. Historically the focus and hypotheses of researchers that PA increases life span and decreases the effects of diseases that impair function and locomotion have been confirmed. For most individuals, however, quantity without quality of life would be tortuous. Within the last decade investigators have confirmed that PA can lead to increases in self-esteem, self-efficacy, and quality of life in general. Whether PA enriches our lives and feelings of well-being about our family, friends, work, play, and spiritual status, or whether a poverty of PA becomes a constraint that adds additional challenges to advanced aging is partially under our control. Frequent PA is beneficial for everyone at every age, the healthy, those with disabilities and disease, and even the frail elderly. No excuses! Opportunities to participate in PA are abundant if people just look for them.

PHYSICAL ACTIVITY IN THE PREVENTION OF DEMENTIA

Etnier, Jennifer

Department of Kinesiology, University of North Carolina at Greensboro, United States.

Alzheimer’s disease (AD) is the most common form of dementia and its prevalence is increasing worldwide. Although researchers are working to identify treatments for AD, current treatments do not offer a cure. Thus, researchers are also focused on preventive strategies that may reduce the risk of or delay the onset of AD. Physical activity (PA) is one behavior that may hold promise in this regard. Evidence from prospective studies with cognitively
normal adults shows that PA is predictive of less cognitive decline over time and that PA decreases the relative risk of dementia. Meta-analytic reviews of this literature indicate that as compared to the least active group, participants who are the most physically active have 28-45% less risk of AD (Hammer & Chida, 2009; Daviglus et al., 2011). Evidence from randomized controlled trials (RCTs) also indicates that older sedentary adults who begin a PA program show greater improvements in cognitive performance than are observed in a control group (Colcombe & Kramer, 2003). Recent research has focused on understanding moderators and mechanisms of the relationship between PA and cognitive performance. One moderator that is of interest is a person’s genetic risk for AD as determined by apolipoprotein E (APOE). APOE is a strong susceptibility gene for AD, and cerebral structure and function differ as a function of APOE genotype in non-demented adults (Kok et al., 2009; Morris et al., 2010; Reiman et al., 1996, 2003). Cross-sectional (Deeny et al., 2008; Etnier et al., 2007; Obisesan et al., 2011; Smith et al., 2010) and prospective studies (Niti et al., 2008; Podewils et al., 2005; Rovio et al., 2005; Schuit et al., 2001) report on the moderating effect of APOE on the relationship between PA and cognition; however the results of these studies are inconsistent and future research is necessary to clarify this relationship. With regards to mechanisms, one promising line of research supports the potential of neurobiological mechanisms. Animal studies indicate that PA influences the availability of growth factors (e.g., brain derived neurotrophic factor) that affect brain structure and function (Cotman et al., 2007; Voss et al., 2011). Future experimental research with humans is needed to enhance our understanding of moderators and mechanisms of the relationship between PA and cognition.

Symposia

THE WATERMEMORIES SWIM CLUB FOR PEOPLE WITH DEMENTIA

Neville, Christine1, Henwood, Tim2; Clifton, Karen1; Beattie, Elizabeth1

1University of Queensland, Australia; 2UQ/Blue Care Research Practice Development Centre, Australia.

Alzheimer’s Disease International reports that 36 million people worldwide have dementia and that this number could more than double by 2030. In addition to symptoms related to persistent memory loss, individuals become physically compromised, a precursor to reduced functional performance and quality of life. Recent research has shown that among community-dwelling adults with Alzheimer’s disease regular and purposeful exercise can improve function and behaviour. However, little work is available among those residing in residential aged care facilities (RACFs). Anecdotal reports suggest swimming may be a positive stimulus for those with dementia, evidenced by improved mood, increased verbal response and general happiness and awareness. However, while there is positive evidence for those with Parkinson’s disease, no structured investigations of aquatic exercise exists among those with dementia. The Watermemories Swimming Club is an innovative concept that aims to evaluate the impact of an evidenced-based aquatic exercise program on functional, physical, psychosocial, and behavioural wellbeing in older adults with dementia. RACF residents participated in the program twice weekly over a 12-week period. Measures of functional capacity, balance, muscle strength, anthropometry, quality of life, sleep, pain, falls, behavioural and psychological symptoms have been collected. This symposium will describe and discuss all aspects of the swimming club including conception, design, deliv-
Psychosocial and behavioural considerations

Neville, Christine

*University of Queensland, Australia*

**Background:** People with dementia who live in a residential aged care facility (RACF) often have multiple unmet needs such as inadequate daytime activities, social isolation, anxiety, depression, and psychological distress. Predictors of higher unmet needs include behavioural and psychological symptoms (BPSD), low community involvement and limited social networks. The Watermemories Swimming Club was designed to increase physical activity in persons with dementia, improve health as well as enhance social, BPSD and affective outcomes. This pilot study evaluated the impact of a dementia-specific, aquatic exercise program on several psychosocial and behavioural outcomes. **Methods:** People with dementia living in two RACFs were invited to a 45-min dementia-specific, evidence-based aquatic exercise session, two times a week over a 12-week period. Data was collected at four time points: pre-intervention (T1), six weeks into the intervention (T2), nine weeks into the intervention (T3), and post-intervention (T4). Measures included The Generalized Anxiety Inventory, Cornell Scale for Depression in Dementia, Psychological Well-Being in Cognitively Impaired Persons and the Revised Memory and Behavior Problems Checklist. **Results:** Eleven people (median age = 88.4, IQR = 12.3; 1 male) completed the program. The Friedman Test indicated there was a statistically significant increase across the first three time points for psychological well-being ($\chi^2 = 8.66, p < .05$). Preliminary investigations also identified a significant decrease in the number of BPSD identified ($\chi^2 = 16.91, p = .001$) and the degree to which these behaviors distressed RACF staff ($\chi^2 = 16.86, p = .001$). **Conclusion:** The pilot study indicated that an evidence-based aquatic exercise program can produce positive psychosocial and behavioural outcomes for people with dementia. Further, long-term research is required to fully investigate the impact of the Watermemories Swimming Club on depression and anxiety.

The Watermemories Swimming Club for people with dementia: Exercise and functional capacity considerations

Henwood, Tim

*UQ/Blue Care Research Practice Development Centre, Australia*

**Background:** Regular exercise offers significant benefits for those with cognitive disease (Vreugdenhil et al., 2011). While positive anecdotal reports from pool-based activity do exist for those with dementia (McKenzie, 2011), no research is available among those residing in residential aged care facilities (RACFs). The aim of this project was to evaluate the impact of a structured aquatic exercise program on functional and physical wellbeing in older adults with an advanced diagnosis of dementia residing in a RACF. **Methods:** Twenty-three participants (83.7 ± 8.9 years, 2 men) were recruited from two RACFs. Participants undertook two 45-min dementia-specific, evidence-based aquatic exercise sessions per week over 12 weeks. Classes were delivered by a qualified swimming instructor and RACF staff and
volunteers supplied supervision and motivation within the pool. The program was informed by past aquatic exercise evidence for the elderly, and adapted to the cognitive capacity of people with dementia. Functional performance (Seniors Physical Performance Battery and the BOOMER), grip strength, and bioelectric impedance analysis (BIA) data were collected at baseline and post-intervention. All measures underwent a test-retest reliability assessment.

**Results:** Preliminary analyses of baseline data indicate excellent reliability for BIA and grip strength measures (Interclass Correlations Coefficients (ICC) > .925), while some balance measures were less than optimal. At baseline, participants had walking speeds of 0.5 ± 0.2 m/s, timed up-and-go measures of 114.0 ± 30.9 s, BMIs of 27.6 ± 5.7 kg/m², and 56.7 ± 37.9% body fat. Positive anecdotal data have emerged, and quantitative post-intervention outcomes are presently being analysed. **Conclusion:** Participants in the present study had low functioning capacity and high body fat, which is typical of very old adults residing in RACFs. Variables that required little or no balance had excellent reliability in this population.

**The Watermemories Swimming Club for people with dementia: Knowledge translation considerations**

Clifton, Karen

*School of Nursing and Midwifery, The University of Queensland, Australia.*

**Background:** The purpose of this project was to try something different – rekindle positive memories of swimming in people with dementia who enjoyed swimming throughout their lives, and get them involved in active swimming again. Dementia often conjures up bleak pictures of agitation and disengagement with pleasures of daily living. However, there is nothing about dementia that should stop this wonderfully healthy and enjoyable activity. This project evaluated a primarily pleasure-based swimming club for people with dementia. **Methods:** People with dementia residing in two residential aged care facilities (RACFs) were enrolled in a dementia-specific, evidence-based aquatic exercise program. Residents attended two classes a week over 12 weeks. As a pilot study, a large component of the analysis focused on process data and the pragmatics of running such an innovative program. Focus groups and interviews were conducted with RACF staff, some residents, and the swimming instructor, into feasibility and best-practice issues related to implementing and sustaining such a program. Barriers and facilitators were noted and recommendations are currently being developed into a readily accessible website, manual and accompanying DVD that demonstrates the exercise program. **Results:** Preliminary analysis indicates several key issues to address when developing such a swimming club: choice of pool (temperature, depth, access, occupancy); swimming equipment (costumes, floatation devices, continence devices); RACF resources (volunteer availability, resident preparation); family education (concerns for resident safety and enjoyment); instructor/volunteer training; program presentation and adaption for participants with dementia; frequency of classes. **Conclusion:** This pilot project has identified key barriers and facilitators in implementing and maintaining a swimming club for people with dementia. This knowledge will be disseminated via an informative website, manual and training DVD.

**GERI OLYMPICS: A 25 YEAR HISTORY—FROM CHARLESTON TO PRAGUE**

Muilenburg, Ted; Woodrum, Bill; Beane, Todd

*West Virginia State University, United States*
For 25 years the Geri Olympics Programs have been planned to promote wellness, active living, and quality of life for nursing home residents through competitive sports, team work, and intergenerational programming. The competitive events help improve the quality of life reducing the negative side effects of a sedentary life and focusing on several non medical issues as well. Relevant and related research will be presented, as will actual events and the guidelines for completing each event. Geri Olympics has been recognized at various levels of government as a program that advocates for improved quality of life within a segment of the population that is often over looked. The history of Geri Olympics will be presented as well as goals and planning objectives for residents. Experiences with planning, management, marketing and networking will be presented. Geri Olympics is a unique model that brings University students, faculty, and community volunteers as well as professionals together in planning an event for a nearly forgotten segment of the population. The research related to successful aging includes volumes of information which references the benefits of social engagement, need for exercise, being involved in meaningful events and groups, and having a sense of independence or control of one’s schedule. All of these are benefits of Geri Olympics Programs through both outreach efforts in rural hospitals with more frail patients, or with nursing home residents who attend and compete in adapted sports. This symposium will cover: 1. History of Geri Olympics; 2. Goals and Objectives of Geri Olympics; 3. The evolution of the events and the actual events; 4. Related Research to Geri Olympics, aging and senior issues; 5. Advocacy and building bridges to the communities; 6. Planning concerns and guidelines; 7. Volunteers recruitment, selection and training. **Keywords:** Geri Olympic; Active Ageing; Events; Volunteers

**ISSUES IN ACTIVE AGEING RESEARCH: AN ARGUMENT FOR CONSENSUS ON OUTCOME MEASURES**

Sipe, Cody¹; Howe, Tracey²; Skelton, Dawn²

¹Harding University, United States; ²Glasgow Caledonian University, UK

The absence of a core standardized set of functional outcome measures makes it difficult for researchers to choose which measures to use. Measures may be single task, dual task, combinations of functional activities or composite measures. Often authors disagree on whether measures should be considered primary or secondary functional outcome measures. This makes it difficult to compare results between studies and compounds the problems of pooling data for systematic reviews. These issues have been highlighted in recent meta-analyses in which authors have selected measures for pooling based on their individual judgment of the relative importance of the outcomes. The enormity of the inconsistency of outcome measures as well as the extreme variability of exercise interventions (type, duration, intensity, supervision) complicates the interpretation of results across studies. Developing a consensus set of core outcome measures of functional ability would enhance the interpretation of data and enable pooling of data. The recently established COMET (Core Outcome Measures in Trials) Initiative aims to require consensus, guidelines, and adherence to achieve consistency. A core outcome set represents the minimum that should be measured and reported in all trials in which physical function of older adults is an outcome. This does not restrict outcome measurements in a trial but rather creates an expectation that the core outcomes will be collected and reported. This will make it easier for the results of trials to be compared, contrasted, and combined. The results of a scoping study of Cochrane reviews to determine the types and frequency of functional outcome measures reported in the literature, which will be presented at the symposium for feedback, is expected to initiate a formal consensus process.
Towards a consensus definition of healthy ageing: A systematic literature review

Barron, Evelyn; Lara, Jose; White, Martin; Mathers, John
Newcastle University, UK.

Physical activity interventions are being used to facilitate healthy ageing. The absence of a consensus definition of healthy ageing and measurement tools based on that definition is an impediment to the testing of physical activity and other lifestyle based interventions. Depp & Jeste (2009) reviewed definitions of healthy ageing and found significant overlap between definitions but also differences in the domains of healthy ageing covered by each definition. Although Depp & Jeste(2009) provided a good summary of the definitions of healthy ageing, there were limitations in their methodology notably the restriction of literature searches to PubMed and Google Scholar. Our review will build on the work by Depp & Jeste and will expand it by including further relevant search terms and by searching a broader range of online databases. The following search terms will be run in Medline, Embase, Scopus, PubMed and Google Scholar: Search strategy: ‘Successful ageing’ or ‘successful aging’, ‘health* ageing’ or ‘health* aging’, ‘productive ageing’ or ‘productive aging’, ‘optim* ageing’ or ‘optim* aging’, ‘ageing well’ or ‘aging well’, ‘positive ageing’ or ‘positive aging’, ‘unimpaired ageing’ or ‘unimpaired aging’ and ‘dynamic ageing’ or ‘dynamic aging’. Selection criteria include published in English, published in peer reviewed journals, studies reporting quantitative data from adults over 55, studies that operationalize the definition of healthy ageing as a dependent variable, and cross sectional or longitudinal studies. The full protocol will be registered with PROSPERO. A summary of the domains of healthy ageing covered by each definition will be presented, e.g. physical activity, social interactions etc. As part of the work of the LiveWell Programme, this definition will contribute to the development of a panel of measures aimed to capture the Healthy Ageing Phenotype for use as outcome measures with physical activity and other lifestyle based interventions. Keywords: Definition; Healthy Ageing; Physical Activity; Wellbeing; Quality of Life.

WHAT FACTORS CONTRIBUTE TO SUCCESSFUL COGNITIVE AGEING?

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There are more older people in society today, and people are living longer. A prominent concern amongst older people is what factors contribute to our retaining our cognitive functions. Therefore, the determinants of successful cognitive ageing are being sought as a research priority. It is particularly important to understand what contributes to successful ageing before people decline into dementia or mild cognitive impairment, because it is most likely that interventions at the early stages will be most effective, and that this is where prevention may take place. Searching for the determinants of cognitive ageing should take as wide a series of perspectives as possible. These should include genetic, medical, health, psychological, social, lifestyle, and other factors. This symposium will describe the efforts to do this in the context of the Lothian Birth Cohorts of 1921 and 1936. There will be presentations on a number of different possible contributors to successful cognitive ageing including genetic and medical causes, activity and lifestyle causes and contributions from brain health and integrity. Practical implications will be emphasised.
Studying lifetime cognitive ageing in the Lothian Birth Cohorts of 1921 and 1936

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The Lothian Birth Cohort of 1921 comprises 550 individuals who took part in the Scottish Mental Survey of 1932. The Lothian Birth Cohort of 1936 comprises 1,091 individuals who took part in the Scottish Mental Survey of 1947. The LBC1921 were first recruited at age 79, and have been followed up regularly to age 90. The LBC1936 were recruited at age 70 and have been followed up until age 76. These individuals, remarkably, also had cognitive ability tested in the Scottish Mental Surveys of 1932 and 1947, respectively. The assessments in childhood and old age will be described. In old age, the participants undertake a wide range of cognitive, health/medical, lifestyle, social, and other assessments. They have also given blood for DNA extraction and detailed genetic testing. The LBC1936 have also undergone a detailed structural brain scan. This means that a very wide range of potentially causal factors can be examined for the clues to successful ageing of cognitive capabilities. This presentation will introduce the cohorts and some of the genetic and environmental findings to date. This includes candidate gene studies. For example, possession of the e4 allele of the APOE gene is associated with poorer cognitive ageing from childhood to old age, and within old age itself. Also, genome-wide genetic testing in the Lothian Birth Cohorts has revealed how the environment and genes contribute to how much cognitive ability changes from childhood to old age. This presentation provides an introduction for the talks that follow, on health behaviours, activity, and brain structure.

Health behaviours and cognitive function in old age

Corley, Janie 1, Gow, Alan J 1,2, Starr, John M 2,3, Deary, Ian J 1,2

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Certain lifestyle factors have been identified as potentially important predictors of cognitive ageing. Evidence suggests that cognitive performance in old age can be maintained by health-promoting behaviours such as a healthy diet, moderate alcohol consumption, and smoking avoidance. Determining the extent to which such health behaviours are associated with cognitive outcomes in later life is vital, as these behaviours are modifiable. To date, we have investigated the contribution of caffeine and alcohol intake, smoking behaviour, and Body Mass Index (BMI), to individual differences in non-pathological cognitive ageing in the Lothian Birth Cohort 1936 Study (n = 1091). We undertook a general linear model approach for each set of analyses, which allowed us to control for potentially confounding variables, including, age, sex, childhood cognitive ability (IQ) and adult socioeconomic status (SES). People with a higher caffeine and alcohol consumption and BMI had significantly better cognitive abilities at age 70. However, these relationships were found to be confounded by childhood IQ and SES. Continuing to smoke into old age showed detrimental effects on
general cognitive ability and processing speed tasks after controlling for covariates. Results from each of the analyses will be presented. Based on this evidence, we suggest that many of the previously reported associations between health behaviours (e.g. moderate caffeine and alcohol consumption) and cognitive abilities in old-age are artifacts of confounding by a higher premorbid intellect and SES and the possible influence on these factors on the adoption of health behaviours in adulthood. In conclusion, the effects of lifestyle on cognition in old age are difficult to disentangle from the effects of cognition on lifestyle and from other confounding variables; the relationship is bidirectional. However, the results from the LBC1936 suggest that smoking in old age is a risk factor for cognitive ageing.

**Activity and cognitive ageing: A healthy mind in a healthy body?**

*Gow, Alan J 1,2, Corley, Janie 2, Aribisala, Benjamin S 3, Bastin, Mark E 1,3,4,5, Starr, John M 1,6, Wardlaw, Joanna M 1,3,4, Deary, Ian J 1,2*

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A number of lifestyle factors that have been proposed as protective against age-related cognitive decline have been assessed in the LBC1936. These have included participation in social and intellectual activities, level of physical activity, and social networks and support, for example. Recent analyses will be presented in which the associations between activity and cognitive ability were examined at age 70. While participation in socio-intellectual activities (reading, visiting museums, attending social groups, etc.) was associated with higher cognitive ability in old age, these associations were attenuated when childhood cognitive ability was considered (Gow et al., 2012). That is, the associations reported resulted from those of initially higher ability being more likely to have taken up these pursuits across the lifespan, rather than their having a beneficial effect. Physical activity, however, remained associated with cognitive ability, after controlling for childhood ability; participants who reported being more physically active performed better on tests of general cognitive ability and processing speed. These findings have been followed-up by investigating whether activity participation is associated with aspects of brain structure, assessed by a number of brain imaging parameters. Increased physical activity was associated with fewer white matter lesions (age-related damage to the white matter connections), less brain atrophy and higher white matter integrity 3 years later (Gow et al., under review). More recently, the effect of physical fitness (measured by lung function, grip strength, walk speed) on brain atrophy have been examined in detail. These new analyses look at both fitness level at ages 70 and 73, and fitness change across time as predictors of atrophy.

**Brain structure and cognitive ageing: Imaging the Lothian Birth Cohort 1936**

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The Disconnected Mind (http://www.disconnectedmind.ed.ac.uk) seeks to understand how alterations to the structure of white matter, the brain’s wiring, produce age-related decline in cognitive function using the Lothian Birth Cohort 1936 (LBC1936). This unique group of 1091 participants were born in 1936 and underwent cognitive testing in 1947 at age 11. Currently in their 70s, the subjects have undertaken repeat cognitive testing and have just completed the first of two waves of brain Magnetic Resonance Imaging (MRI). The examination includes structural MRI to describe general brain appearance, a detailed volume scan to measure brain size, and sequences to map white matter connections and characterize age-related damage. These latter sequences include diffusion tensor MRI, which measures the random motion of water molecules in vivo and can be used to quantify white matter tract integrity and map its three dimensional structure in a technique termed tractography, and magnetization transfer MRI (MT-MRI) which provides a quantitative measure of the integrity of myelin, effectively the white matter’s insulation. This examination represents one of the most advanced imaging protocols ever undertaken to investigate brain structure in normal ageing. Now that the first wave of imaging is complete, and the second has commenced, analysis is ongoing to use this wealth of brain MRI data to investigate relationships between brain structure and life-long changes in cognitive ability. For example, we have found links between brain volume, white matter lesion load and iron deposits with cognition, and how white matter tract integrity affects general intelligence and neuroticism. In this talk I will provide an overview of the brain MRI of the LBC1936, describe some of our recent important findings, and discuss how our methods are being used to provide further insights into links between white matter and cognitive ageing.

COMPARING STRENGTH AND POWER TRAINING IN OLDER PERSONS

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Demographic shift towards an older population in industrialized countries pose challenges for the individual, public health system, researchers and politicians. Of high priorities is the maintenance independent status among older adults, with aspects of functional, cognitive, and psychological wellbeing. Decline and/or limitation in physical function and capacity in activities of daily living are precursors for institutionalization, mortality, and co-morbidities. Muscle strength and muscle power contributes to physical function, and both are characterized during normal ageing by a progressive decline. Muscle strength is directly related to the force capacity of the muscle. In contrast, muscle power is defined as the work per unit of time and is the product of force (strength) and movement velocity (speed). Research shows that up to 40% of muscle strength and 75% of muscle power can be lost across the life span. While multifactorial, the loss of muscle strength is due primarily to the atrophy of muscle mass and muscle fibres, and the loss of muscle power is related to the loss of type II fast-twitch muscles fibres. Recent research has demonstrated different effects on physical function by planned and structured muscle strength and muscle power intervention in older persons1-6. The symposium will focus on the different effects of muscle strength and muscle power exercise (Jonathan Bean), as well as the impact of training duration, follow-up
Comparing the effects of strength training and power training among older adults with mobility problems

Bean, Jonathan F.

Harvard University, United States

Exercise has many health benefits for older adults improving disease status and physical functioning. Mobility is one aspect of physical functioning that has been a primary focus of exercise research. This is for two main reasons. Firstly, mobility problems are very prevalent affecting more than 25% of individuals 75 years and older and secondly, because mobility is a risk factor for other adverse outcomes such as disability, institutionalization and mortality. Currently, the treatment that is recognized to be most efficacious in improving mobility is exercise. Early observational studies exploring mobility pointed to strength impairments as the attribute most worthy of targeting with exercise. Subsequent studies suggested that muscle power impairments may have a greater influence on mobility. A premise of much of the clinical literature and studies to date is that one mode of exercise has been advocated to treat all patients with mobility problems. This presentation will review the results of recent studies among older adults with mobility problems comparing the effectiveness of modes of strength training versus modes of power training. Additionally the relevance of limb speed, the factor that distinguishes limb strength from limb power, will be highlighted. References: Guralnik JM, Ferrucci L, Pieper CF, et al. Lower Extremity Function and Subsequent Disability: Consistency Across Studies, Predictive Models, and Value of Gait Speed Alone Compared with the Short Physical Performance Battery. J Gerontol Med Sci. 2000;55A(4):M221-M231.; Bean JF, Vora A, Frontera WR. Benefits of exercise for community-dwelling older adults. Arch Phys Med Rehabil. Jul 2004;85(7 Suppl 3):S31-42; quiz S43-34; Bean JF, Kiely DK, LaRose S, Goldstein R, Frontera WR, Leveille SG. Are changes in leg power responsible for clinically meaningful improvements in mobility in older adults? J Am Geriatr Soc. Dec 2010;58(12):2363-2368; Pahor M, Blair SN, Espeland M, et al. Effects of a physical activity intervention on measures of physical performance: Results of the lifestyle interventions and independence for Elders Pilot (LIFE-P) study. J Gerontol A Biol Sci Med Sci. Nov 2006;61(11):1157-1165; Bean JF, Kiely DK, LaRose S, O’Neill E, Goldstein R, Frontera WR. Increased velocity exercise specific to task training.

**High-velocity versus conventional resistance training for older adults: Effect and considerations of training, detraining and retraining**

Henwood, Tim.

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Associated to a loss in muscle mass and atrophy of muscle fibres, the loss in muscle strength is said to be a predictable and preventable feature of normal ageing. While the loss in muscle strength is debilitating, evidence suggest that the associated loss in muscle power has greater impact on functional performance and falls risk for the older adult. Nevertheless, for all older adults the decline in muscle mass and performance (strength or function), termed sarcopenia, is associated with substantial negative health consequence. However, research show irrefutably that exercise, most specifically resistance training, is an effective countermeasure to the loss in muscle mass and performance, with addition benefits found for bone mineral density, body composition, cognitive wellbeing and chronic disease. However, among older populations resistance training participation numbers are low, and, for those training, consideration is needed given the older adults susceptibility to extended training interruptions. This presentation will confer the benefits of resistance training for older adults by drawing from a number of research studies, with specific consideration given to the outcomes of a 60-week high-intensity resistance training intervention (training-24 weeks (n = 53), detraining-24 weeks and retraining-12 weeks (n = 27) among healthy community-dwelling adults aged 65 - 84 years that compared conventional moderate-velocity constant-resistance muscle strength training (3 sets (75%1RM), 8 repetitions) to high-velocity varied-resistance muscle power training (1 set (45, 60, 75%1RM), 8 repetitions). The benefits of training and consequences of detraining to muscle performance (strength, power, movement velocity and function) and anthropometry (bone mineral density, muscle and fat mass) will be discussed. In addition, the barriers and motivators to resistance training will be introduced and the impact of training on maintained independence, quality of life, falls and morbidity considered. Results indicate that both muscle strength and muscle power training have significant benefits for the old and very old adult, that high-intensity training has a residual impact on muscle function, and that the decreases in muscle strength associated with detraining can be regained through short-term retraining. These results have important implications for the exercise prescription for older adults.

**Physical exercise to obtain stronger muscles and better immunity at higher age**

Bautmans, Ivan.

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There is growing evidence for the involvement of inflammatory processes in the development and progression of several age-related conditions, among which sarcopenia (age-related loss of muscle mass) and frailty (one of the major geriatric syndromes) (Bautmans et al., 2009). In fact, ageing, even in healthy persons, is commonly accompanied by slightly elevated concentrations of circulating pro-inflammatory mediators (such as Interleukin[IL]-6 and Tumor Necrosis Factor-Á), a phenomenon corresponding to a chronic low-grade inflammatory profile (CLIP) (Beyer et al., 2012). Older persons presenting more pronounced CLIP show indeed lower muscle mass and muscle strength; and are more likely to become frail. Elderly people possess an important residual, but latent, physical potential, which can be
mobilized by training, even at very high ages (>90 years). Physical exercise has also strong regulating and favourable effects on CLIP. Besides providing anabolic stimuli, it is well known that intensive physical training provokes an inflammatory reaction, accompanied by the liberation of pro-inflammatory cytokines (especially IL-6) and complex changes in the cellular components of the immune system. In this context, IL-6 is thought to be mainly released from the contracting muscles and would act as a “myokine,” exerting a different function from that seen during e.g. acute infections. The acute phase response to exercise is positively related to the intensity of the muscle work delivered. Recently, it has been shown that older persons, similar to young adults, are able to respond to physical stress by a significant exercise-induced increase of circulating IL-6 (Bautmans et al., 2005). In fact, the exposure to (repetitive) mild stress has been shown to improve survival and longevity both at the cellular and organism level. In this context, an improved wound healing by physical training, has recently been described in old mice and in older humans; the underlying mechanisms, possible immune-related, have not been elucidated yet. Exercise can probably lower infection-induced cytokine release by peripheral mononuclear blood cells. Physical exercise would thus reduce sarcopenia as well as CLIP and the acute inflammatory response upon infection in the aged; thus enlarging considerably the scope of geriatric rehabilitation professionals in designing health-enhancing physical exercise programs. To date, however, optimal dosage of exercise to obtain most beneficial effects remains elusive, and more research is warranted to unravel the exact dose-response relationship. References: Bautmans, I., Njemini, R., Vasseur, S., Chabert, H., Moens, L., Demanet, C., Mets, T., 2005. Biochemical changes in response to intensive resistance exercise training in the elderly. Gerontology 51, 253-65; Bautmans, I., Van Puyvelde, K., Mets, T., 2009. Sarcopenia and functional decline: pathophysiology, prevention, and therapy. Acta Clin Belg 64, 303-16; Beyer, I., Mets, T., Bautmans, I., 2012. Chronic low-grade inflammation and age-related sarcopenia. Curr Opin Clin Nutr Metab Care 15, 12-22.

The influence of physical therapy on power and strength

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Physical activity as well as adequate nutrition is basis for maintaining muscle strength and power in old age. Both are the basis for executive function and safe performance of the activities of daily living. Therefore physical exercise is an important component of geriatric prevention and rehabilitation. There is recommended a combination of resistance training and endurance training. There are no detailed recommendations for intensity and impact yet. Training cessation and/or immobilisation is one of the main reasons for progression of sarcopenia and functional decline. Loss of muscle power has a higher impact on muscle function than loss of muscle strength in old age. Therefore physical therapy including exercise and training becomes more important during hospital stay. If there is no active muscle activity possible, electric stimulation can be used to continue training, e.g. at intensive care wards. If patients are able to follow the physical activity, electric stimulation may support the training effect and the activity in the motor neuron. The quality and power of muscle fibres as well as the muscle mass will be the result. Even if there is no neurological dysfunction exercise itself can fail to regain muscle force or to keep muscle fibres and mass. Electric stimulation of the muscle may be supportive. Although there is an increasing numbers of data available, there are long term studies missing. The combination of resistance and power training, and for frail people electric stimulation, will improve quality of muscle and physical function. References: Henwood TR, Taaffe DR. Detraining and retraining in older adults

RAISING THE STANDARDS FOR TRAINING FITNESS LEADERS TO WORK WITH OLDER PEOPLE

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The “International Curricular Standards for Physical Activity Instructors of Older Adults,” adopted by the World Health Organization in 2005, represents a significant international effort to identify the foundational knowledge that fitness professionals need to work competently with older clients. Yet these guidelines have not been fully utilized by the fitness industry. In the United States personal training is still completely unregulated. Trainers are not required to have a specific degree, attain licensure, or even hold a certification. A handful of certifying bodies have attained third-party accreditation for their certifications yet educational standards vary widely. In Canada exercise leadership for older adults is still largely unregulated. However, steps to accredit Kinesiology professionals and exercise physiologists have been taken. The Canadian Society for Exercise Physiology and the Canadian Centre for Activity and Aging are leaders in education. The Active Aging Specialist™ Instructor certification from Canadian Fitness Education Services will raise leadership standards and allow all levels of fitness leaders to advance their skills and abilities. In Europe and the UK standards for exercise leaders are more highly developed. The European Register of Exercise Professionals [regulated by the European Health and Fitness Association (EHFA)] uses an accepted official European Qualification Framework (EQF) for determining the minimum standards of exercise professionals. There are numerous approved educational providers but wide variations still exist and better consistency is needed. In an effort to create globally accepted standards the EHFA has hosted 2 International Fitness Standards meetings with organizations and leaders from around the world. Concern for older adults should be a priority issue in this discussion.

BUILDING A NATIONAL STRATEGY TO PROMOTE PHYSICAL ACTIVITY: THE ACSM SYMPOSIUM

Buchner, David¹; Rogers, Michael²; Chodzko-Zajko, Wojtek¹; Morgan, Amy³

¹University of Illinois at Urbana Champaign, United States; ²Wichita State University, United States; ³Bowling Green State University, United States.

Levels of physical activity are low in U.S. adults, and promotion of physical activity remains a public health priority. In the U.S., the American College of Sports Medicine (ACSM) has been involved in several important initiatives to promote physical activity in older adults.
This session will discuss four of these initiatives. 1) The U.S. National Physical Activity Plan (David Buchner, MD MPH FACSM, University of Illinois). The National Physical Activity Plan is the first comprehensive plan for increasing physical activity in all U.S. populations groups. Launched in 2010, the plan identifies high priority strategies for increasing levels of physical activity. This presentation will describe the development and implementation of the plan. 2) The ACSM Strategic Health Initiative on Aging (Michael Rogers, PhD FACSM, Wichita State University). To enhance its activities related to physical activity and exercise in older adults, ACSM established the Strategic Health Initiative on Aging. This presentation will describe the activities and accomplishments of the initiative. These include scientific statements on the benefits of physical activity in older adults, as well as practitioner tools for assessing older adult’s ability to participate in exercise programs. 3) Exercise is Medicine (Wojtek Chodzko-Zajko, PhD FACSM, University of Illinois). In 2007, the “Exercise is Medicine” campaign was launched as a joint initiative of ACSM and the American Medical Association. It involves promoting physical activity for both its preventive and therapeutic effects, and seeks to increase the role of the US health care system in promoting physical activity. This presentation will describe the objectives, activities, and achievements of the initiative. 4) ACSM Strategy for Practitioner Education (Amy Morgan, PhD FACSM, Bowling Green State University). ACSM plays a major role in the continuing education of practitioners regarding the role of physical activity in prevention and treatment of diseases. This presentation will discuss issues in helping practitioners stay current on issues in physical activity in older adults, as well as provide an overview of a recent resource from ACSM: The ACSM Guide to Exercise for Older Adults.

The U.S. National Physical Activity Plan

Buchner, David M

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This presentation will describe the development and implementation of the U.S. National Physical Activity Plan (http://www.physicalactivityplan.org/). Launched, in 2012, the National Physical Activity Plan identifies high priority policies, programs, and initiatives for increasing physical activity in all population groups, including older adults. The recommendations are organized into eight societal sectors: public health; health care; education; transportation, land use and community design; parks, recreation, fitness, and sports; business and industry; volunteer and non-profit organizations; and mass media. For each strategy to increase levels of physical activity, the Plan identifies specific tactics for implementation. Numerous organizational partners, including ACSM, are involved in implementing the plan. The National Coalition for Promoting Physical Activity in the United States is playing a leading role in coordinating and implementing the Plan. For each sector of the plan, the coalition identified partners that would advance the strategies of that sector. Most strategies involve creating policies, environments, and systems that support regular physical activity. A funded evaluation of the implementation and of the impact of the Plan is ongoing. The presentation will also discuss the relative merits of an age-specific plan as compared to an inclusive national plan for all age groups.

The ACSM Strategic Health Initiative on Aging

Rogers, Michael E.

Wichita State University, United States.
To enhance its activities related to physical activity and exercise in older adults, the American College of Sports Medicine (ACSM) established the Strategic Health Initiative on Aging (SHI-A). This presentation will describe the major activities and accomplishments of the initiative. SHI-A is led by ACSM members with expertise in physical activity and aging. SHI-A provides leadership in professional education, programming, partnership engagement, and identifying research-related opportunities for ACSM. For example, the committee is actively engaged in building synergies with Exercise is Medicine. SHI-A led the revision of ACSM’s Position Stand on Exercise and Physical Activity for Older Adults. It is responsible for writing the ACSM Best Practices Statement on Physical Activity Programs and Behaviour Counselling in Older Adult Populations. SHI-A has also supported the development of a new screening tool for older adults called EASY (Exercise And Screening for You) as well as the Active Aging Toolkit. The initiative has directed active aging training modules at regional ACSM meetings. SHI-A was a key partner in the development and implementation of The National Blueprint: Increasing Physical Activity Among Adults Age 50 and Over, and the ACSM/AHA Physical Activity Guidelines for the Older Adult. The initiative collaborated with the U.S. National Institute on Aging Exercise Workbook, the 2008 Guidelines for Physical Activity for Americans, the Active Aging Community Center, and the U.S. National Physical Activity Plan. Participants in SHI-A have also developed ACSM Policy Roundtables, participate in subsequent policy workgroups, and encourage ACSM members to submit sessions to the Health and Fitness Summit and propose symposia for Annual Meeting that focus on aging and activity.

Exercise is medicine
Chodzko-Zajko, Wojtek.
University of Illinois at Urbana Champaign, United States.

This presentation will describe the objectives and achievements of the “Exercise is Medicine” campaign that is a joint initiative of the American College of Sports Medicine and the American Medical Association. On November 5, 2007 Exercise is Medicine was launched with the goal of encouraging primary care physicians and other health care providers to include exercise when designing treatment plans for patients. Exercise is Medicine strives to make physical activity a “vital sign” that is routinely assessed at every patient interaction with a health care provider. This presentation will provide an overview of the structure and major initiatives of Exercise is Medicine. Exercise is Medicine is a multi-organizational initiative coordinated by the American College of Sports Medicine whose guiding principles are as follows: (1) Exercise and physical activity are important to health and the prevention and treatment of many chronic diseases, (2) More should be done to address physical activity and exercise in health care settings, and (3) Multi-organizational efforts to bring a greater focus on physical activity and exercise in health care settings are to be encouraged. Exercise is Medicine calls on each person and all partners dedicated to the idea that exercise truly is medicine to continue to build, support and advocate for physical activity as essential for global health and wellbeing by committing to action. Policy makers are called to change policy to support physical activity as a vital sign for health. Health care providers and fitness professionals are called to integrate exercise into every patient and client interaction. Communities, workplaces, and schools are called to promote physical activity as an essential part of health and wellbeing. More information about Exercise is Medicine is available online at www.exerciseismedicine.org.
ACSM strategy for practitioner education

Morgan, Amy L.

Bowling Green State University, United States.

This presentation will provide an overview of the role of ACSM in providing resources for education of practitioners on the topic of physical activity in older adults. As the% of the world’s population over age 65 continues to increase, practitioners in areas related to exercise science need competency in promoting physical activity in older adults. Practitioners need to stay current with knowledge regarding the impact of physical activity on the treatment and prevention of diseases associated with advancing age. Practitioners need an understanding of the breadth of health benefits of physical activity in older adults, such as physiologic effects on bone health, mental health benefits on cognition, and social benefits related to regular participation in physical activity. A new resource from the American College of Sports Medicine, ACSM Guide to Exercise for Older Adults, is designed to meet these needs. The book, for ‘entry level professionals’, is intended to be a manual to help health and fitness professionals guide older clients in their selection of appropriate exercises and physical activities. Basic topics related to physical activity and healthy aging are discussed in an applied context. This presentation will comment on some of the challenges in providing continuing education of practitioners as well as provide an overview of this new resource from ACSM.

PICKING UP OLDER MEN: REFLECTIONS FROM THE FIELD

Jones, Roger.

AgeUK, UK.

Background: Fit as a Fiddle (FaaF) is a new programme designed to help older people to live more healthy, active and fulfilling lives. The research is based upon the specific strand aimed at engaging with older men the reasons for targeting this group are the health inequalities between men and women. Key Statistics for Older Men: 1) The average UK male life expectancy at birth is currently 77.7 years. This varies for occupation and part of the country. For women average UK life expectancy is 81.9 years. 2) Diagnoses of both prostate and testicular cancer are up since the early 1990s. 3) Men are now more likely than women to be mentally ill. 4) Men are increasingly unlikely to consult a doctor. 5) Compared to the wider population, Indian, Bangladeshi, Black Caribbean and Irish men are at greater risk of heart disease and stroke. This is probably due to a combination of things. 6) Men in the north of the UK are generally less healthy than men in the south. Men from Manchester and Blackpool have the shortest life expectancy. The purpose of this research is to outline the most effective way to engage or ‘pick up’, motivate and retain older men.

Methods: The 1st author has managed the FaaF project working directly with organisations across a range of contexts (i.e., rural, urban, gay, sport based) amongst others for approximately 5 years. The 1st author will allude to his experiences and reflections as an applied practitioner and manager in this field, outlining critical operational necessities for effective work with older men.

Results: The results allude to the impact the project has had using National partners and trained peer mentors in engaging men in activities and groups which attract them retain them and also have lifestyle changing impacts.

Conclusion: The conclusion will include results from the National evaluation by Ecorys and Keele University and the case studies collated during the programme.

Keywords: Older Men; Life Expectancy; Rural; Urban; Programmes; Community.
PHYSICAL ACTIVITY, FITNESS, AND FATNESS: INTERACTIVE IMPLICATIONS FOR PHYSICAL FUNCTION AND QUALITY OF LIFE IN OLDER ADULTS

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Aging and concurrent declines in physical activity are associated with increased risks for obesity and physical disability. In the United States, individuals aged 60 and over are more likely to be obese than younger adults with ~42% of older women being obese. Management of obesity in older adults is challenging as weight loss also causes bone and muscle mass loss, thereby increasing risks for osteoporosis and sarcopenia. Beyond physical health, obesity can also compromise psycho-social health status reducing vigor and quality of life. Physical activity is an established key to weight management, enhances physical function, and positively impacts psycho-social health in older adults. However, the interactive effects of physical activity, body composition (fat and muscle mass), fitness (musculoskeletal and neuromotor), and physical and psycho-social function are not clearly delineated. Moreover, health status may alter the relations among the aforementioned variables in that physical function may be most impacted by musculoskeletal and neuromotor fitness in frail individuals whereas adiposity may be the primary predictor in higher functioning older adults. The objective of this symposium is to highlight the contemporary literature regarding: a) weight management guidelines for older adults, b) the interactions among physical activity, fitness (muscle strength, endurance and power; neuromotor control), body composition (fat and skeletal muscle mass), and physical function within the context of health status; c) the negative implications of obesity on psycho-social health and the utility of physical activity to enhance quality of life even in the presence of excess adiposity; and, d) statistical considerations when conducting research in this area to isolate the physical activity, fitness and body composition effects on physical function. Our symposium, similar to the disease of obesity, is multi-faceted and will use an integrated and interdisciplinary approach.

Physical function: Is it physical activity, fitness, fatness, or an interaction thereof?

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Physical function typically declines with age and is associated with decreased physical activity, increased sedentary time, poorer fitness and health, reduced quality of life, and falling. Overweight and obesity can contribute to physical function limitations and disability through imposed physical limitations on mobility as well as through mechanisms such as sarcopenia and co-morbid chronic diseases such as restrictive lung disease, type 2 diabetes mellitus, coronary heart disease, osteoarthritis, kidney disease and others. On the other hand, chronic diseases and conditions can contribute to overweight and obesity, reduced physical activity and fitness, and physical function limitations. Thus, physical function limitations can both be cause and effect of physical inactivity, overweight/obesity and chronic diseases and conditions. This presentation will discuss the inter-relationships between physical activity, physical function and physical fitness and health, with a particular focus on the management of body fatness and weight in older persons. Recent research about the role of physical activity and exercise in affecting the various components of physical fitness and physical function will be discussed.
Obesity and psychological well being: Physical activity, obesity and quality of life
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Health-related quality of life (HRQOL) is a multidimensional concept that includes domains related to physical, mental, emotional, and social functioning. Obesity impairs HRQOL in older adults and higher degrees of obesity are associated with greater impairment. Obesity associated decrements in HRQOL are most pronounced on the physical domains of functioning since obesity exacerbates the age-related decline in physical function. Conversely, participation in regular physical activity is associated with better HRQOL especially in the physical domains. Recent studies have begun to jointly examine the interaction of age, obesity, and physical activity on HRQOL in older adults and suggest that physical activity can ameliorate the negative impacts of obesity on HRQOL. This presentation will examine the independent and interactive effects of obesity and physical activity on HRQOL. Results from the SENIOR Project and other major studies will be highlighted.

Statistics and research design: Teasing out the effects of physical activity, fitness, and adiposity
Rowe, David A.
University of Strathclyde, UK.

Physical (in) activity (and more recently sedentarism), fitness and body composition have all been implicated as determinants of public health. Public health outcomes in older adults include cardiometabolic health, orthopaedic health, cancer prevention, psychosocial well-being, ability to conduct the activities of daily living, and ultimately, prevention of premature mortality. The unique and interactive effects of these factors on health are not well understood, despite extensive research (the empirical debate of “fit vs. fat” effects on mortality, for example has continued for over a decade). In this presentation, a variety of research examples will be used to illustrate ways in which researchers have designed studies and analysed data in order to tease out the relative importance of physical activity, fitness, and body composition to health. Commonly used methods such as linear regression, logistic regression, analysis of covariance, canonical correlation, and structural equation modelling will be introduced and explained. Limitations of these methods will be identified and take-home messages will be presented to guide researchers towards stronger designs and analysis methods in the areas of physical activity, fitness, body composition, functional ability, and quality of life.

CHALLENGES AND OPPORTUNITIES FOR INCREASING DAILY ACTIVITY IN OLDER AGE
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Older adults are the least active segment of the population in western societies. This symposium will present recent research on the challenges and opportunities for effective promotion of active ageing. This will include: 1) Qualitative data from urban and rural living older people which identifies unique challenges accruing from the interplay of personal, interpersonal, and environmental barriers to active living. 2) Accelerometry data from observational cohort studies on older people showing that although levels of physical inactivity and obesity are
high in older adult populations, daily trips out of the house, for any reason, are associated with more activity in all groups of older people. This raises the possibility that social and/or environmental interventions that encourage older people to get out and about in their communities may be an acceptable and effective alternative to medical or structured exercise interventions. 3) Longitudinal data from a nationally representative sample of older adults in England, showing that volunteering is associated with lower all-cause mortality - partially mediated by increased physical activity – and may therefore provide an attractive opportunity for the promotion of active ageing. 4) Findings from a recent MRC-funded scoping project to identify a range of activity promotion strategies that could be used in community programmes using literature reviews, secondary data analysis and stakeholder focus groups. Finally, video recordings of older adults performing singing-and-movement activities will highlight the potential for providing meaningful and enjoyable activities through local initiatives. An audience-and-panel discussion will focus on implications for the development of attractive and feasible activity opportunities for older people. **Keywords:** Activity; Promotion; Urban; Rural; Longitudinal Data; Accelerometry; Qualitative.

**EXERCISE FOR IMPROVING PERFORMANCE IN ALL FUNCTIONING LEVELS: FROM MASTERS ATHLETES TO GERIATRIC CARE RESIDENTS. EGREPA SPECIAL SYMPOSIA**

Brach, Michael¹; Netz, Yael²; Hinrichs, Timo³; Suominen, Harri⁴

¹University of Muenster, Germany; ²Wingate Institute, Israel; ³Ruhr-University Bochum, Germany; ⁴University of Jyväskylä, Finland.

**Background:** Generally, physical exercise is known to be effective in maintaining and improving fitness and health over the life course. Target groups above 60 years of age show broad differences in goals, abilities, and life styles. Therefore, special issues in research arise. These refer to effects of exercise, but also to implementation of exercise programmes. In this symposium, we will exemplarily discuss exercise interventions aiming at athletic performance, at health prevention and at regaining mobility. Beneath physical effects, cognitive effects of physical activity and exercise in different subgroups of older adults and in different settings will be considered. **Acknowledgement:** This symposium is organized by EGREPA, the European Group For Research Into Elderly And Physical Activity. EGREPA is a European partner of ICAPA, the International Coalition Of Aging And Physical Activity. With this arrangement, EGREPA would like to contribute to the success of the ICAPA World Congress On Active Aging.

**Improving athletic performance in older adults**

Suominen, Harri.

*University of Jyväskylä, Finland.*

Preserving adequate physical performance is an essential requirement for health and functioning among the ageing population. The greater the reserve capacity in physiological components such as muscle strength, speed, and endurance, the greater is the potential for elderly people to prolong an active and independent life. Master athletes with outstanding physical capacity and optimized living habits provide us with a human model of successful ageing, where age-related physiological changes are less influenced by factors such as sedentary lifestyle and associated chronic diseases. Although elite athletes continue to represent a small proportion of their age cohort, they offer a barometer of what is possible
in physical health and ageing. The plasticity of performance is preserved in later life thus making it possible to modify the age-associated decline in the different aspects of fitness and functioning. Our recent study in master sprinters showed that participating in a periodized strength training programme, in which heavy-resistance exercises were combined with explosive type of weight training and plyometric exercises, induced further improvement in maximal, explosive and sport-specific force production, hypertrophy of type II muscles fibres, as well as improvement in cortical bone thickness and mass distribution of the tibia shaft. Although health complications may occur during sports and the occurrence of severe injuries may end the athletic career, there seems to be no such health-related reasons as to why those who have good training background and feel healthy should not participate in master athletics. Modified power types of exercises could also be recommended as part of overall physical training for less active persons. If, before the onset of mobility impairment, older adults could switch their physical activity toward the type of training practiced by master athletes, they would have considerable potential to improving their musculoskeletal function and, thereby, reducing the risk of mobility impairments, falls and fractures with ageing.

Exercise programmes for community-dwelling seniors with impairments: Making use of the primary care setting

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Community-dwelling older adults who are chronically ill or mobility-restricted are at high risk for physical deconditioning and consequently, for losing their independence. Even in this target group, exercise programmes can be applied safely and effectively to improve physical functioning. Present guidelines recommend multidimensional exercise (including training of endurance, strength, balance, and flexibility) integrating preventive and therapeutic aspects. Concerning the optimal setting of an exercise programme for the target group, there are some issues to be considered: group exercise fosters social contacts, whereas home-based exercise does not require special facilities, costly devices or transport. Under a public health perspective, the access to home-based exercise therefore seems to be easier. In general, mobility-restricted elderly are difficult to reach for exercise interventions as many of them rarely leave their homes. Additionally, their own perception of limited health is a major barrier to exercise. One of the few persons who have regular access to the target group is the general practitioner (GP). GPs often have established long-lasting and trustful relationships with their older patients. They know their medical history and are able to judge their ability to perform certain exercises. However, there are various reasons why GPs do not counsel patients on physical activity (e.g., time constraints, lack of formal training in physical activity counselling, lack of educational resources). In summary, the GP’s practice seems to offer the ideal venue for recruiting and supporting patients to perform an exercise programme, but demands on GPs should be minimised, e.g., by including additional personnel into the counselling process (e.g., trained nurses, health educators or exercise therapists). These health care team members should be trained to apply strategies fostering behavioural change and to adapt exercise programmes to individual needs and constraints.

Offering strength training to elderly with dementia and their family member carers: A block randomized “placebo” controlled trial

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**Background:** After a new exercise programme had proved feasible in residential care settings, we offered it to patients with dementia together with their family member carers, who as a general rule belong to the elderly target group themselves. The present two arms 3 phase multicentre block randomised “placebo” controlled trial aims at feasibility on multiple levels and at effects. **Methods:** Local service providers and dementia service centres were approached for hosting exercise groups. Instructors with professional background either in work with the elderly or in sports were trained. Intervention groups performed the exercise programme for a 12 week learning and a 12 week training phase. Control groups performed a 12 week placebo programme (general social and cognitive activation) and afterwards the interventional design. The exercise programme includes ten resistance exercises, covering muscle groups necessary for everyday movements, carried out in a slow, controlled manner with one or two series, ten repetitions per set, intensity about 80% of the 1 repetition maximum (duration 2x60min/week) over at least 24 weeks in a joint group for both the patient and family carer. Outcome measurements were: Burden Scale for Family Caregivers (BSFC), Functional independence measure plus functional assessment measure (UK FIM+FAM), Mini Mental State Examination (MMSE), Barthel Index & Instrumental Activities of Daily Living (IADL), Timed “up and go”, Hand grip force, Chair stand test, Shoulder flexibility, Hand-eye coordination test, Daily movement (questionnaire and accelerometer). **Results:** Regarding feasibility and response, in total 39 agencies welfare, community, churches and sport clubs took part; implementing 43 groups with 320 participants were reached. Most of the participating pairs and instructors reported positive experiences and continued after the end of the study. 16 groups received credit as low threshold choice for informal dementia care, which ensures sustainable financing. Regarding effects, the changes were small, as expected. It was not possible to receive any significant difference between control and experimental group. **Discussion:** In this field study, results from the literature could not be confirmed using standardized tests. This does not accord individual reports. Aspects of test suitability and the “placebo” programme are discussed. This study was funded by the Ministry of Work, Health and Social Affairs of the state North-Rhine Westphalia (Germany), 24.17.01-62-V42A-3372.

**Aerobic fitness and multidomain cognitive function in advanced age**

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**Background and Aim:** The relationship between physical fitness and cognitive function is well-evidenced; however, studies generally assess this relationship by measuring only one or two specific cognitive tasks, and the age of participants in these studies does not extend beyond a mean age of 70 years. In addition, cognitive decline and cardiac failure frequently coexist in the elderly. Cerebral hypoperfusion and cardioembolism have been advocated as pathophysiological links. This presentation will describe the relationship between physical fitness and multidomain cognitive function in two populations – subjects older than those previously reported and cardiac patients. **Methods:** Study I included 38 individuals, aged 65.3 to 85.3 years living in a retirement center, and study II – 50 individuals, coronary heart disease patients, aged 60.5 to 94.3 years, who participated in a cardiac rehabilitation program for at least one year. Participants performed a graded, progressive, maximal exercise test and based on a median score of peak VO2 (Study I) or on official age and gender norms of peak VO2 (Study II), participants were divided into low-fitness and high-fitness groups. Cognitive function was assessed by means of a computerized neuropsychological battery. **Results:** In study I, the high-fitness group achieved significantly better scores on attention...
(U = 102, p = 0.04), and on the global cognitive score (U = 97, p = 0.04), and a significant correlation was demonstrated between peak VO₂ and attention, executive function, and global cognitive score (r's = .37, .39, .38 respectively). Better scores on attention (t = 2.45 p = 0.02) and on the global score (t = 2.14, p = 0.04) were also observed in the high-fitness group than in the low-fitness group among the cardiac patients in the second study. In that study the differences on executive function scores were marginally significant (t = 1.84, p = 0.07) in favor of the high-fitness group. In both studies, the trend for superior cognitive scores in the high-fitness group compared to the low-fitness groups was unequivocal in all sub-tests, both in terms of accuracy and reaction time. Conclusion: Maintenance of higher levels of cardiovascular fitness may help protect against cognitive deterioration, mainly in attention and in global cognitive functioning, at an advanced age and also specifically in cardiac patients. An adequately powered randomized controlled trial should be performed to further evaluate this hypothesis.

Oral Presentations

MEASUREMENT AND EFFECT OF ACTIVE LIFESTYLES

Physical Activity variation in the elderly: Influence of time of year and weather

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Background: Sedentary behaviour is related to several chronic diseases and is among the top three modifiable risk factors for premature mortality, cardiovascular disease and several other chronic diseases. Despite these risks, results from studies show that a high percentage of people are inactive, and that the weather variables may be a barrier to participation in physical activity (PA), especially in the elderly. Purpose: This study aims to describe daily life PA, throughout the year, using accelerometers, in a sample of elderly individuals. We also aim to examine changes in PA and in accomplishments of PA recommendations, as well as to explore the effects of weather on PA. Methods: Participants, 202 men and women (mean age 73.63 ± 9.48 years, BMI 26.77 ± 0.08 kg/m²), wore an accelerometer (ActiGraph GT1M, ActiGraph, Pensacola, Fla.) and were monitored for 4- to 7 days. Periods of data collection were defined as T1 (September to December), T2 (January to April), and T3 (May to July). Time spent in different intensities of PA, average daily steps, and weather variables were measured on the monitoring days and analysed to explore the influence of weather on PA and on compliance with the PA recommendations. Results: January to April was marked by the period of the year when PA significantly decreases. Women revealed to be more influenced by precipitation, and men by temperature. None of the compliers to the 10,000 steps per day recommendation was influenced by any weather variables. Conclusions: Our results show that the time of year when evaluations takes place has influence on data of PA, and confirm that, however weakly, environmental factors may influence elderly individual’s will to engage in PA. Therefore, these data could be taken into consideration when defining more adequate interventions and health promotion efforts designed to increase PA in these age groups. Keywords: Physical Activity; Environmental Factors; Chronic Diseases; Accelerometers.
Patterns of physical activity in older adults during the baseline phase of the I’DGO TOO street intervention study

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Physical activity levels and self-report activity diary data recorded during the baseline phase of an environment intervention study (I’DGO TOO) were examined for patterns in activity over time and across activity type. The study involved adults aged 64-95 years living at 9 locations across the UK (8 in England, 1 in Scotland). Physical activity was monitored using Actigraph GT1M accelerometers (n = 50; 28 female, 22 male), and information on activity type was recorded by participants using activity diaries (n = 57). Monitoring periods varied from 1 to 7 days, with activity levels recorded for a total of 311 days. Daily total activity was calculated for each participant, and the average number of min active for each hour of day was calculated for 4 categories of activity intensity (counts per min): (i) sedentary (0-99); (ii) light (100-1040); (iii) moderate (1041-1941); and (iv) vigorous (1040-6999). Daily total activity ranged from 196 to 10366 counts, with a mean of 3384 counts, and standard deviation of 2078 counts. The average number of min active per hour ranged from none during sleeping hours (0100-0600h) to a maximum of 19 min/hr between 1200-1300h. Most activity was in the light category with a maximum of 15 min/hr activity between 1200-1300h. The peak in moderate activity was 2 min/hour, occurring between 1000-1300h. Walking was the type of activity with the highest recorded frequency, followed by going to the shops and sitting outdoors. In each case the activity occurred most frequently in the morning, and least frequently in the evening. Further analysis of the data is underway, including activity bout length and examining the data for variations by activity type, age, gender, and socioeconomic variables. This study provides useful information on levels and patterns of physical activity in older adults living in urban areas in the UK. Keywords: Physical Activity; Urban; Intervention; Walking; Accelerometers.

Measuring physical activity in residential care/assisted living residents with the FITBIT motion tracker®

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Few studies have examined physical activity (PA) participation and functional abilities for elders in residential care/assisted living (RC/AL). Moreover, slow gait patterns, common in RC/AL residents, compromise accurate measurement of walking behavior. We tested the Fitbit Motion Tracker® to measure steps/day in this population. Elders enrolled in an ongoing longitudinal study (n = 82), Physical Activity and Disability in Residential Care/Assisted Living Residents, completed the Short Physical Performance Battery (SPPB) and grip strength testing, and wore the Fitbit for three days at baseline data collection. Data from subjects with at least two days of Fitbit wear c 8 hours/day (n = 68) were used to estimate the association between PA level and physical function. The total sample was 82% female with a mean age of 84.4 (SD = 8.7) years and body mass index (BMI) of 27.3 (SD = 5.6). Mean gait speed for subjects able to complete the 4-meter (m) walk (n = 66) was .56 m/sec. In subjects with at least two days of Fitbit wear, mean SPPB score was 6.3 (SD = 2.6) and steps/day were 1412 (SD = 1320; range 23–7613). Steps/day were correlated with handgrip strength (r = .27, p < .05), total SPPB scores (r = .52, p < .001) and all SPPB components.
Neither age nor BMI was significantly correlated with SPPB score or steps/day. Men had stronger handgrip (M = 25.1, SD = 9.7) than women (M = 17.3, SD = 3.5) [t(10.5) = 2.79, \( p = .018 \)]. We found no other gender differences. Significant associations in the expected direction were found between Fitbit-recorded steps/day and tests of physical function. The range of 20-7600 steps/day reflects the variability in walking behaviour of physically limited RC/AL residents. The Fitbit detects steps in slower walkers; however RC/AL residents often forgot to wear the device as required. The problem of missing data could be remedied by RC/AL staff overseeing the Fitbit wear schedule. **Keywords**: Physical Activity; Residential Care; Walking; Steps; Fitbit Motion Tracker®.

**Healthy lifestyle programme on elderly people health in Arak, Iran**

**Hekmatpou, Davood; Shamsi, Mohsen; Zamani, Majid**

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**Background**: Increasing life expectancy and decreasing fertility rates, increasing numbers of older people across the world, therefore the aging population as an important public health challenges in the current century, that will be doubly consider in vulnerable group. This study aimed to determine the impact of healthy lifestyle program on health elderly in Arak.

**Methods**: This is a quasi-experimental study that carried out on 60 elderly in Arak. Samples participated in classes were in nutrition, exercise, sleep hygiene and life skills and personal hygiene for a month and includes four training sessions and followed for three months then information collected includes standard quality of life questionnaire (SF-36) and standard tools to measure daily activities (Katz) in the elderly has been in before and three months after the intervention has been completed and analyzed. **Results**: The average age of elder is 67.61 ± 5.02 years. The distribution of gender the majority were is men (60%). In terms of quality of life indicators in the before educational intervention (13.3%) in poor (30%), medium (41.7%) and good (15%) were also high. After intervention the majority of samples in the well (38.3%) and higher were (45%). The significant difference in the before and after the educational intervention there was a \( p < 0/001 \). Moreover the activities of daily living in elderly Katz before and after training, there was a significant difference \( p < 0/001 \).

**Conclusion**: Comparison of quality of life and activities of daily living in older adults before and after the intervention showed continuing education is fruitful various classes and training necessary for this groups that seem neglected to be essential. Results of this study to develop appropriate educational strategies on healthy lifestyle in support of the elderly. **Keywords**: Life Expectancy; Quality of Life; Daily Activities; Intervention, Training.

**The effect of regular walks on cognition and health aspects in older people with dementia**

**Volkers, Karin M; Scherder, Erik JA.**

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Physical activity has proven to be beneficial to reduce the risk of dementia, and to improve physical function, rest-activity rhythm, and mood in cognitive healthy older people. However, what physical activity can do in people who already have a dementia is less known. The aim of the present study is to investigate the effect of regular walks on cognition, rest-activity rhythm, mood, and physical function in older people with dementia. Ambulatory older people with a dementia are random allocated to the experimental or control condition. Participants of the experimental condition walk 30 min a day, 5 days a week, as part of daily
nursing care; in other words, this program is a continuous program. All dependent variables are assessed at baseline, after 6 weeks intervention and subsequently every 3 months. Neuropsychological tests measure cognition, ActiGraphy assess rest-activity circadian rhythm, questionnaires assess mood and physical tests measure physical functioning, i.e. condition, strength, (functional) mobility and balance. The first results of this study will be presented. **Keywords**: Walking; Cognition; Mood; Physical Function; Dementia, ActiGraphy.

**Indicators of psychological well-being and their association with objectively measured physical activity in older adults**

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Maintaining physical activity (PA) into older age is beneficial, especially for mental health. However, objective measurement is still rare in research. **Methods**: Older adults (n = 240, mean age 78.1yrs) were recruited for Project OPAL through 12 Bristol-based GP practices. Researchers conducted two home visits to collect psychological well-being indicators: the Satisfaction with Life Scale, SF12 (Short-Form general health) and Ageing Well Profile. The latter assesses developmental, physical, mental, and social dimensions of subjective well-being. Physical function and key socio-demographic and health-related data were also recorded. Seven-day accelerometry measured steps per day, min of moderate-to-vigorous PA (MVPA) and sedentary time. Additionally, a log recorded daily trips from home (purpose, destination, and mode of transport). Correlation and regression analyses were used to summarise associations between PA and well-being. **Results**: No significant relationships emerged between time spent sedentary and psychological well-being. Significant univariate relationships (all p < .05) were observed between: steps per day and the SF12 (r = .44) and life satisfaction (r = .15), MVPA and the SF12 (r = .47), and trips out and the SF12 (r = .30) and life satisfaction (r = .15). Consistent logical and significant associations were seen between subjective well-being dimensions and steps per day, MVPA, and trip frequency (r range .14-.46). These relationships were largely unaffected when adjusted for age, gender, and educational attainment. However, they were substantially reduced when physical function was added. PA and function explained 28% of the variance in SF12 scores, and 18% of subjective wellbeing. Older adults who are active and make frequent trips from home are more likely to experience higher levels of well-being. However, this relationship is influenced by level of physical function. Amount of sedentary time appears to be unrelated to psychological well-being. **Keywords**: Mental Health; Wellbeing; Physical Activity; Sedentary Time; Accelerometers.

**The adverse health outcomes and predictors in community-dwelling older adults of different frailty levels**

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**Background and Purpose**: Frailty syndrome with declined physiologic reserve capacities will make older adults (OAs) highly vulnerable to adverse health outcomes (AHOs), such as hospitalization and mortality. Finding predictors may help to prevent or defer those AHOs. The purposes of the study (1) To examine and compare the occurrence of the AHOs in different levels of frailty for 2 years periods; (2)To determine and compare the independent
factors associated with AHOs 2-year later in different levels of frailty. **Method:** A convenient sample of 350 OAs, aged 65 years and older, living in the community participated in this study. The baseline evaluation included demographic and health status, functional tests, mental and depressive status, and 5 phenotypes of frailty. The subjects will be followed with annual examinations and finally, medical records check for AHOs. Cox proportional hazard model and logistic regression were applied in the analyses. **Results:** Of the 350 enrolled, 104 of whom were “non-frail,” 192 were “pre-frail,” and 53 were “frail.” At baseline, the three groups were significantly different in age, height, weight, comorbidity, GDS, MMSE, and all functional tests. After adjustment, the frail OAs had significantly higher hazard ratios in emergency visit, higher GDS scores, and worse 6 min. walk test 2-year later compared with the other groups. Different factors may predict different AHOs in the 3 levels frailty OAs respectively. **Conclusion:** Frail OAs had higher rates of AHOs. No regular exercise, higher GDS score, worse Timed up and Go test and 30 sec sit-to-stand test at baseline predict many AHOs. **Keywords:** Demographics; Health Status; Frailty Syndrome; Exercise.

**PHYSICAL ACTIVITY SURVEYS**

**Invited lecture: Interactions between individual, social, behavioural and environmental influences on physical activity**

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**Background:** Progress with effective physical activity promotion has suffered from a focus on individual-level characteristics and behaviours. However the physical activity behaviours of older people are likely to vary according to a wide range of factors. **Objective:** To assess physical activity levels objectively using accelerometers in community dwelling over 65s and to examine associations with health, social, environmental, and psychological factors. **Participants:** A cross sectional survey was undertaken in primary care with random sampling of over 65s in four strata: young-old (65-80 years); old-old (over 80 years), more affluent; less affluent. Main outcome measures: Accelerometry counts of activity per day. Associations between activity and psychological factors (attitudes and beliefs), the physical environment, health, wellbeing and demographic variables were examined with multiple regression analysis and multilevel modelling. **Results:** 547 older people (mean (SD) age 79(8) years, 54% female) were analysed representing 94% of those surveyed. Accelerometry counts were highest in the affluent younger group, followed by the deprived younger group, with lowest levels in the deprived over 80s group. Multiple regression analysis showed that lower age, higher perceived behavioural control, and the physical function subscale of SF-36, and having someone nearby to turn to were all independently associated with higher physical activity levels (R² = 0.32). In addition, hours of sunshine were independently significantly associated with greater physical activity in a multilevel model. **Conclusions:** Other than age and hours of sunlight, the variables identified are modifiable, and provide a strong basis for the future development of novel multidimensional interventions aimed at increasing activity participation in later life. **Keywords:** Physical Activity Levels; Accelerometry; Wellbeing; Demographics; Survey.

**Impact of body composition and physical activity in older men and women**

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Aging is associated with increases in body fat, decreases in muscle mass and physical activity (PA) which can lead to declines in lower extremity physical function (LEPF). The aim was to determine the relations among PA, adiposity (%Fat), central adiposity (%C-Fat), leg lean mass (LM) and LEPF. Adults (n = 325,140 male; 71.7±7.1 yr) were assessed for body composition by DXA, LEPF via 6 min walk (WLK), Timed Up Go (UPGO) and 30s chair rise (CHR) and PA by questionnaire. Males had lower %Fat (32.1±7.6 v 37.2±9.2), lower %C-Fat (32.0±8.2 v 39.1±13.4), greater LM (19.4±2.2 kg v 13.4±1.9 kg) and more PA compared to females (all p < .01). Males had 16% greater WLK, 13% faster UPGO and 16% more CHR relative to females (all p < .001). Correlation coefficients, controlled for sex, assessed relationships between body composition and LEPF. LEPF was correlated with %Fat (CHR r = -.18; UPGO r = .20; WLK r = -.22), %C-Fat (CHR r = -.22; UPGO r = .17; WLK r = -.26) and LM (CHR r = -.10; UPGO r = -.12; WLK r = -.20) (all p < .01). PA was correlated with LEPF (CHR r = .13; UPGO r = -.20; WLK r = .25; all p < .05) but not with adiposity or LM (both p > .05). Stepwise linear regression determined LM, %C-Fat and PA independently contributed 17.3%, 6.4%, 3.8% to variance in WLK (all p < .001). %C-Fat, sex and PA accounted for 8.4%, 3.0%, 1.6% of the variance in CHR, while PA, %Fat and LM contributed 7.1%, 5.2%, 1.8% to UPGO (all p < .05). To explore interactions between body composition and PA for LEPF, tertiles were created for LM, %Fat and PA. 2-way ANOVAs were used to explore additive effects on LEPF. In the absence of interactions (all p > .05), a main effect for PA existed for LEPF measures (all p < .05), a main effect of %Fat existed for WLK (p = .02) and UPGO (p = .06); whereas, no main effects existed for LM (all p > .05). Results indicate that although LM, adiposity and PA influence LEPF performance, the strong consistent relation between PA and LEPF of varying demands highlights the importance of PA to prevent disability. Keywords: Physical Activity; Adiposity; Gender; Disability Prevention.

Mental wellbeing and its associations with physical activity, health and aspects of deprived neighbourhoods in Glasgow, UK

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Links between levels of physical activity (PA), area deprivation, health, and subjective wellbeing are well established, but have seldom been examined simultaneously in populations of older people. A range of these aspects are examined in a population of 1631 residents, aged 55 years or more, across 30 deprived neighbourhoods in Glasgow, UK, who were interviewed in 2008 as part of the GoWell Community Health and Wellbeing Survey. Mental wellbeing was measured on the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) and total PA was classified into low, medium, or high categories on the basis of responses from the International Physical Activity Questionnaire (IPAQ). A multivariate, two-level model (with residents nested within neighbourhoods) was developed to examine the relative strengths of the associations of mental wellbeing with respondents’ (a) level of PA habitually undertaken, (b) level of personal and neighbourhood deprivation, (c) physical and mental ill-health (assessed by the SF-12 physical and mental health component scores) and the experience of long-term illness and recent health conditions, and (d) perceptions of the quality of the home and neighbourhood. Better wellbeing was associated with being physically active, being personally less income-deprived, and having more positive perceptions of the home and neighbourhood. However, physical and mental ill-health were strongly associated with lower wellbeing scores, particularly in comparison with younger people living in the same neighbourhoods. There were also otherwise-unexplained large neighbourhood-wide
differences in wellbeing scores. The implications and limitations for developing physical activity-based interventions as part of the policy to raise levels of wellbeing in Scotland for older people in these environments are considered. **Keywords:** Physical Activity; Mental Wellbeing; Interventions.

**Is there a role for physical activity in preventing cognitive decline?**

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**Background/aims:** Exercise plays an important role in maintaining cardiovascular health and optimal cognitive performance. We aimed to examine the association between physical activity and cognitive decline in midlife. **Methods:** Participants were 1414 men and women from British 1946 birth cohort. Physical activity was self-reported at 36 and 43 years, assessing prospectively the participation in sports and recreational activities. Cognitive function (verbal memory and visual search speed) was measured at both 43 and 63 years. Multiple linear regressions were used to examine the associations between physical activity and cognitive performance at baseline and with 20 years cognitive decline, while adjusting for sex, father’s social class, childhood cognition, education, adult social class, and depression. **Results:** The most active levels of physical activity at both 36 and 43 years showed a protection in verbal memory performance at age 43 compared to inactive levels (fully adjusted association). For visual search speed performance at age 43, the most active on that year showed a significant protection after adjusting for all covariates 11.05 (95% -1.09 to 21.00); while the association with most active levels at age 36 was explained by the childhood social class. Interestingly the most active levels of physical activity at age 43 showed a significant negative association with the 20 year decline in verbal memory. **Conclusion:** These results suggest that there are long term benefits of high levels of exercise on brain and cognitive performance in midlife, therefore vigorous levels of activity should be promoted until later in life. **Keywords:** Physical Activity; Cognitive Decline; Cardiovascular Health.

**Ageing successfully in the Basque country: Impact of leisure patterns on subjective wellbeing and health’s perception**

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Strong evidence supports a positive impact of physically active forms of leisure on longevity, autonomy, and cognitive functioning in older people. The issues in current research on this field concern matters of intensity and extensity (“dose”). Nevertheless, policy makers and researchers are increasingly aware that a sense of competence and fulfillment, a satisfactory social life and even moments of savoring and enjoyment are also key elements of a healthy and satisfying later life. A more complex and interdisciplinary approach to leisure is needed to understand its role in the promotion of well-being in older people. This was the overall aim of the research whose results we are presenting. In particular, our study sought to establish whether some kinds of leisure patterns correlate with measures of psychological well-being and self-perceived health. The questionnaire was constructed taking into consideration previously validated instruments both in the fields of Leisure Studies (e.g. the Serious Leisure Inventory and Measure – SLIM) and Psychology (Ryff Scales of Psychological Wellbeing). It was administered to a sample of 800 people between 65 and
COGNITION, BALANCE AND GAIT IN AGEING

Walking to the beat: Does music help or hinder older adults’ gait and cognition?

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Background: Recent research into older adults’ gait and cognition has focused primarily on gait measures for fall-prediction and fall-prevention; few studies have investigated cognitive outcomes. This cross-sectional study explores the impact of regulating gait, so that it becomes more rhythmic, by training participants to walk to a regulated musical beat while counting backwards – a dual task (DT) design. Methods: Forty-five healthy older (average 71.7 years) were randomly assigned to three groups (n = 15). Each participant completed a single walking (ST) task (15m) and a single counting task (counting backwards 7s). Step-time variability, velocity, correct cognitive responses, and responses per step were recorded. The Music Training (MT) Group was trained to walk to a rhythmic beat, adjusted to each individual’s pace. The Music Playing (MP) group heard the music (also adjusted to their pace) but received no explicit training. The No Music (NM) group served as controls and heard no music and received no training. The ST gait and cognitive measures were compared with DT measures before and after intervention training. At baseline all participants completed a battery of cognitive tests to examine relationships between their current cognitive function and their ST and DT performance. Results: There was a group effect of task (ST and DT) and time (pre and post-intervention) but only for the MT group. The gait of the MT group steadied significantly after the musical intervention training. In addition EF at baseline, particularly working memory and attention, was strongly associated with gait variability, correct cognitive responses and rhythmicity. Conclusions: These findings suggest that underlying cognitive function is an indicator of rhythmic gait. We conclude that rhythmicity training, to maximise gait performance, has the potential to positively benefit older adults’ physical and mental well-being. Keywords: Cognition; Music Training; Intervention Training; Dual Task.

Cognition and postural sway in active adults

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Introduction Aging is associated with declines in executive cognitive abilities, motor coordination, and balance though mild cardiovascular exercise may improve these in older adults (Kramer et al., 1999). The purpose of this study was to recruit highly active aging adults and normally active controls in order to compare the age-related declines in cognitive function and postural sway. Methods Fifty-six subjects were tested for cognitive function and postural sway. Subjects were 35 healthy highly active adults (HA; 55.1±10.8 yr; 21 W) and 21 healthy controls (SC; 56.9±4 yr; 12 W). Subjects were matched in age, years of education and stratified by age: group 1 (age n 54 yr) and group 2 (age c 55 yr). Subjects were either highly active (HA; c 180 min/wk of vigorous exercise) or normally active (SC; n 30 min/wk). The following tests were performed: balance, postural sway; cognitive tests assessing information processing speed (Colorado perceptual speed test, CPST, and Symbol
Search) and motor speed (Digit Symbol-Coding); and aerobic fitness (VO₂max). **Results** HA have superior balance performance, shorter sway distance, lower sway velocity, and lower sway frequencies than the SC. Additionally, analyses showed a significant main effect for age group, indicating balance declines with increased age. No group by age-cohort effects existed, indicating that both groups had the same degree of age-related declines in balance. Analyses of the cognitive data revealed little in terms of significant differences. However, analyses showed that younger HA had higher information processing scores on the CPST than SC; a difference not observed in the older groups. **Conclusion** Engaging in a lifetime of high levels of vigorous physical exercise is associated with superior postural balance. A major challenge to independent living and quality of life in the elderly is the prospect of physical injury from loss of balance; habitual activity being protective in this regard. **Keywords:** Cognition; Postural Sway; Exercise; Quality of Life; Physical Injury.

**Effects of physical activity level on behavioural inhibition in aging: Study of performance and N2/P3 complex in a go/no-go task**

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**Introduction:** Physical activity (PA) level and cardiorespiratory fitness (CF) are moderators of age-related cognitive decline, particularly in tasks involving inhibition. A task to tap this function is the Go/NoGo task, which requires a button-press response to Go stimuli, and no response to NoGo stimuli. The ERPs after NoGo stimuli reveal a negativity N2 and a positivity P3 over frontal and frontocentral regions, respectively, which could reflect different subprocesses serving behavioral inhibition. **Aim:** To test if age-related effects on inhibition subprocesses are modulated by PA level. **Methods:** 24 young (Y) and 24 older (O) adults were classified as physically active (A) or sedentary (S), based on measures of past (Historical Leisure Activity Questionnaire) and present (accelerometer - Actigraph GT1M) PA. CF was estimated by VO₂ max (Vameval Test for Y, Rockport Walk test for O). EEG from 64 channels was recorded during a visual Go/NoGo task. Reaction Time (RT) and false alarms rate were behavioral measures. **Results:** Preliminary results reveal a significant Age × PA level interaction (p < .05) on RT, with Y participants being faster than O (415 ms vs. 619 ms), and the OA group being faster (574 ms) than the OS group (664 ms). Grand average waveforms from NoGo condition (at Fz and FCz) suggest (i) greater P3 amplitude in Y than O participants, (ii) greater ERPs amplitudes in A than S participants (N2: -3.2, -.7, -.2.5, -.9 lv; P3: 8.7, 6.1, 6, 3.3 lv; for YA, YS, OA and OS respectively), (iii) shorter ERPs latencies in Y than O participants, and (iv) shorter P3 latency in OA than OS group (N2: 268, 272, 326, 328 ms; P3: 364, 364, 430, 448 ms; for the YA, YS, OA and OS respectively). **Conclusion:** The time for the decision to execute or to inhibit a response is less delayed in the OA than OS, compared with young adults. Future analyses of the different inhibition-related ERP components will shed light on the underlying neural substrates. **Keywords:** Physical Activity; Cardiorespiratory Fitness; Go/NoGo Task; Inhibition.

**Physical exercise, motor performance and cognitive functioning**

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Motor learning is important for lifetime motor development, sports, and physical exercise. Optimal motor skill learning plays a critical role in promoting active ageing, physical and...
mental well-being, and quality of life. In the past, the interdependence of cognitive functioning, motor behaviour, and exercise has been reported in a wide range of studies. Research on the cognitive ageing and motor functioning in late adulthood has proliferated. Researchers have examined motor learning in aging populations and how skill acquisition is related to cognitive functioning, mental and physical well-being. Although research findings suggest aging-related decrease in motor functioning and skill learning, some cognitive and motor abilities remain healthy and intact for active lifestyles. A better understanding of the developmental trajectory of cognitive functioning, the benefits of exercise and motor training, and the relationship of all these variables, yields valuable insights into overall health, fall prevention, physical and mental exercise from youth to old age. Thus, the purpose of this paper is to synthesize a large body of literature about the behavioural and neural characteristics of cognitive aging and how motor training contributes to the brain functions and everyday motor skills of older adults. From a lifespan developmental view, this paper proposes an integrative concept of functional development focusing on the dynamics of cognitive functioning, motor performance, and skill acquisition. In this framework, cognitive representations and motor learning potential are closely related and supported by distributed neural systems. Mostly supported by the high level areas of the brain, cognitive control, motor learning, motor performance, exercise are closely related. A broader, more specific and integrative approach is required for geriatric motor behaviour research. Practical implications and future research directions are discussed. **Keywords:** Physical Exercise; Cognition; Mental Exercise; Motor Development.

**Effects of cardiovascular and coordination training on cognition and brain functioning**

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The importance of physical activity for improvement and preservation of cognitive abilities in old age has repeatedly been examined. It is unclear, however, whether different dimensions of fitness, i.e. physical and motor fitness are differentially associated with cognitive performance and brain activation patterns. Furthermore, studies that investigate effects of different types of interventions and longer-term effects are missing. Besides this, it is well known that genetic predispositions might influence cognitive performance. Thus, we (1) analyzed the relationship between older adults’ motor and physical fitness and their cognitive functioning. (2) We performed a 12-month intervention study to investigate effects of cardiovascular and coordination training (control group: relaxation and stretching) on cognition and brain functioning in older adults. (3) We analyzed the effect of COMT polymorphism on the relationship between fitness and cognition. Results revealed (1) that not only physical fitness, but also motor fitness showed a strong association with cognitive functioning. Functional brain imaging data revealed that physical and motor fitness were differentially related to cognitive processes. (2) 12 months of cardiovascular or coordination training improved executive functioning but with differential effects on speed and accuracy. In parallel, neurophysiological results also revealed different changes in brain activity for both interventions in frontal, parietal, and sensorimotor cortical areas. And (3) regression analyses revealed a positive influence of fitness and of the interaction between fitness and COMT genotype on executive functioning, particularly for val/val carriers. Our data suggest that besides cardiovascular training also other types of physical activity improve cognition of older adults. The mechanisms, however, that underlie the performance changes seem to differ depending on the intervention and might be related to genetic polymorphisms. **Keywords:** Cardiovascular Training; Cognition; Physical Activity; Intervention.
Does acute exercise benefit reaction time performance and cognitive control in adults aged 60–70 years?

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Introduction: The effect of an acute bout of exercise has not been widely investigated in the elderly. Moreover, the sustained improvements in reaction time (RT) observed by Joyce et al. (2009) in young adults warrants investigation in this group. This experiment compared the influence of 30 min of acute moderate (mod) exercise on RT performance and cognitive control in young and old adults using a Simon task (ST).

Methods: Twelve young (23±2 yrs) and 12 old (63±2 yrs) volunteers, performed the ST while cycling (During) at a carefully controlled workload intensity (65% of age-predicted heart-rate max), 5 min (Post1), 35 min (Post2) and 65 min post exercise cessation (Post3). The identical procedure was followed during a control rest session with the exception that during the first time point the volunteer was seated on the cycle ergometer without cycling. Sessions were randomised across volunteers.

Results: Results revealed that the young group had shorter RT compared to old adults (346 ms vs 436 ms) (F (1,22) = 18.23, p < .001). The interaction between condition, time and age was not significant (F(3,66) = 1.22, p = .30). However the interaction between condition and time was significant (F(3,66) = 4.50, p = .019). Post hoc analysis revealed that for the first block of trials RT was faster during exercise than during rest (379 ms vs 394 ms, p = .01). Five min post exercise, volunteers are still as fast as during exercise (p = .27), but 35 min after cessation RT performance is back to normal (p = .005).

Conclusion: Present results confirm the cognitive improvement previously observed during mod exercise on young adults, and suggest that this effect is similar in older adults. Results showed a maintained improvement for up to 30 min post exercise (duration of Post1) and not thereafter. Joyce, J., et al. (2009). The time course effect of moderate intensity exercise on response execution and response inhibition. Brain and Cognition, 71(1), 14-19. Keywords: Reaction Time; Cognition; Cycling; Cognitive Control, Exercise.

Age differences in working memory contributions to motor representation in older adults

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Background. In older adults the body is subject to physical, physiological, and cognitive changes. Representations of the body and its kinematics might therefore be expected to change. It has been posited that by studying motor imagery, it is possible to access the unconscious process of action representation. The purpose of this study was to examine (1) if action representation undergoes different phases, and (2) the influence of mediating factors like working memory performance on motor representations.

Methods. 40 young adults (M = 23.8 years, SD = 2.59), and 88 older adults (M = 73.9 years, SD = 8.41) participated in this experiment. As an index of the action representation system, we measured the imagery ability using the Controllability of Motor Imagery test (CMI) and a mental chronometry test (Timed-Up-and-Go, TUG). As mediating factor visual-spatial working memory was assessed (Corsi-Block-Tapping-Test).

Results. Age was associated with an increase in time of TUG, and with a decrease in time of the imagined TUG. For all participants, but the 80+-group movement execution time of the TUG-test significantly correlated with movement imagery time (r = .666 - .891). We found a high temporal congruence for young adults, but
a decrease in temporal congruence between adulthood and older adults. A similar pattern was found for the recognition (controllability of body schema) and regeneration (ability to transform visual imagery) condition of the CIM-test. The analysis of the meditational effect of working memory on age differences in the motor imagery measures showed that the inclusion of working memory increased the amount of explained variance in the CMI as well as in the TUG. Discussion. Action representation changed as indexed by a progressing decrease in performance from adulthood to the senior years on both tasks. The correlation of the visual-spatial working memory performance with the imagery ability is linked to the deterioration of the prefrontal cortex. Keywords: Working Memory; Motor Control; Visuospatial Working Memory; Prefrontal Cortex.

CO-LIVING AND SHARING SPACE

Co-living innovative social community around the elderly

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Social life is as important for young people as for elderly but older people often encounter physical and physiological barriers to participate in the society and maintain their relationships while ageing. Their physical status or the lack of means to facilitate this task can lead to a feeling of isolation and loneliness. Technology can be of great help for the independence of the elderly in the near future, being supportive and encouraging older people to socially interact and maintain an active life. Co-LIVING (full title: Co-LIVING: Virtual Collaborative Social Living Community for Elderly) is an AAL2 project aiming to enhance and prolong the independence and active living of the elderly stimulating a close interpersonal and meaningful social interaction. This will therefore contribute positively to their wellbeing, reducing the risk of psychosocial deterioration and societal exclusion. Co-LIVING is based on an innovative Social Community network (SoCo-net), integrating different mobile wireless ICT based services addressing the elderly social interaction context categories of Care & Wellness, Guidance, and Mobility Monitoring. The main core of innovation in Co-LIVING emerges not only from the use of new technologies for the creation of those services but from the development of an innovative elderly social practice-oriented community model called SoCo-net and in which those services will be based on. SoCo-net builds around the aged person a Virtual Social Care Team consisting of people of different ages and roles (relatives, friends, neighbours, care professionals, etc.) that can assist, collaborate and actively communicate with the elderly to improve its daily life in an ad-hoc and informal way through the use of supportive mobile wireless technologies. Co-LIVING project encourages and facilitates the social life of the older people, becoming and maintaining them as active members of the society while ageing. Keywords: Social Life; Wellbeing; Independence; Active Living.

Perceptions of older people with dementia, their carers and professionals on exercise and activity when living with dementia: Benefits and barriers

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Research into whether and how exercise and increasing physical activity might benefit people with dementia is slowly growing, exploring diverse outcomes including activity levels, wandering, walking, daily function, cognitive function, depression, well-being, and overall
quality of life. Evidence to date is still limited and predominantly from studies in long-term care. However, 2/3 of people with new-onset dementia live at home and life expectancy after diagnosis averages 4-11 years depending on age. So developing and testing community programmes needs to be a priority. Involvement of family carers is crucial in many aspects of life for people with dementia, but their potential role in targeted specific exercise and activity programmes needs evaluating. The Otago Exercise Programme (OEP) of strength and balance training can reduce falls by over a third but, despite the markedly higher falls risk in dementia, evidence comes from studies that excluded the cognitively impaired. We are developing a study to assess the feasibility and acceptability of introducing OEP to people with mild to moderate dementia and their family carers, alongside providing carers with training to progress exercising and activity at home, and teaching how to get up after a fall. In preparation we are conducting a series of focus groups with people with dementia and their relatives, former carers, exercise instructors and care professionals to explore potential barriers and perceived benefits. This workshop will share participants’ perspectives on physical activity, care context, and individual priorities. Understanding these is key to finding successful approaches, but group discussions raised many questions that we hope to explore further with delegates e.g. Why don’t GPs refer people with dementia to falls prevention? What extra training do exercise instructors feel they need? Who believes getting active can help if someone has dementia? Do carers see any advantages to themselves? Keywords: Dementia; Physical Activity; Otago Exercise Programme; Life Expectancy.

Shared space interventions: Impact on older people’s physical activity and quality of life

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Maintaining independent mobility in later life is an important facet of quality of life. The role of the built environment in facilitating physical activity is well recognised. However, longitudinal studies into the effects of changes to the built environment on levels of activity and quality of life outcomes are lacking, especially for older people. Existing studies into the outcomes of Home Zone type interventions have focussed on measurable such as road casualties or traffic speeds, rather than broader behavioural or quality of life outcomes. This paper presents results from a longitudinal study across seven locations in the UK undertaken as part of the I’DGO TOO (Inclusive Design for Getting Outdoors 2) project (see www.idgo.ac.uk). The interventions studied were ‘Home Zone’ style changes to residential streets, designed to make streets more ‘liveable’ by removing the dominance of vehicular traffic and creating shared space. The interventions are focused in deprived areas, where the changes followed an inclusive, community led approach. Residents aged 60+ living in intervention streets and in nearby control streets were surveyed in 2008 and, following the implementation of interventions, in 2010 and 2011. Data collected related to perceptions of the environment, activities undertaken, quality of life and self-rated health, and frequency of getting outdoors. Results suggest that while there are positive changes in perceptions of the environment, the number of outdoor activities undertaken and time spent outdoors in ‘Home Zone’ streets compared to control streets, positive effects on quality of life and health outcomes are less apparent. One potential reason is that a greater time period post implementation is needed for such outcomes to manifest. Understanding the outcomes of changes to the built environment can play an important part in informing the design of streets that will lead to positive outcomes for older people. Keywords: Independent Mobility; Quality of Life; Self-Rated Health; Physical Activity.
PHYSICAL ACTIVITY, WELLBEING AND QUALITY OF LIFE

Fit as a fiddle: The impact of AgeUK’s wellbeing programme on the health and wellbeing of participant’s—Preliminary findings

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As part of a £165 million Big Lottery Fund grant programme encouraging healthy lifestyles and wellbeing (the Wellbeing programme), Age UK has been awarded £15.1 million to deliver the fit as a fiddle portfolio across the nine English regions from 2007 until 2012. fit as a fiddle champions healthy eating, physical activity, and mental wellbeing for older people and comprises of two national projects and 24 regional projects, delivered by over 200 organisations. This paper presents the preliminary findings from the evaluation of the programme – running until the summer of 2012 – examining the impacts of fit as a fiddle on the health and wellbeing of the older people taking part. It focuses specifically on outcomes around physical activity, healthy eating and mental wellbeing and draws on data from a self-completion survey covering a variety of domains, including sociodemographic details, general health, and wellbeing, limiting long-standing illness, daily activities and participation in the programme. The survey is completed three times by each older person, at the start and end of their involvement with the portfolio and then again, three months later. Data are analyzed for changes between the start and end of involvement and are presented with illustrative case studies. Possible implications for policy and practice are outlined. Keywords: Wellbeing; Socio-demographics; Physical Activity; Health.

The importance of a supportive environment for older people’s outdoor projects in predicting life satisfaction

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A supportive environment can help facilitate participation in outdoor activities, and lead to greater life satisfaction among elderly populations. Using Personal Projects as a framework to understand the activities that are salient to individuals, this paper focuses on the role that a supportive environment can play in the types of outdoor projects undertaken by older people and the subsequent relationship with their life-satisfaction. Personal Projects are the self generated and purpose-oriented activities an individual is doing or planning to do (Little, 1983). The efficacy achieved in the pursuit of these activities has been found to be related to an individual’s well-being. Within this the environment can play a greater or lesser supportive role depending on the nature of the project undertaken. It is therefore possible, by examining projects and their environmental dependency to understand the environmental contribution to well-being. Using data from two phases of the I’DGO TOO (Inclusive Design for Getting Outdoors 2) study this paper reports the relationship between measures of Supportiveness of the Natural Environment (SNE) and Life Satisfaction (CASP-19). Supportiveness of the Natural Environment (SNE) scores are calculated based on a personal project questionnaire designed to capture everyday activities that involve being outdoors, related to any aspect of daily life (e.g. home, leisure and community) and undertaken alone or in the company of others. Participants listed out of home projects and rated these according to importance, supportiveness of the environment, and enjoyability. Projects are categorised into four types: Nature-based, Utilitarian, Recreational and People-related for analysis. Overall the results show that an environment supportive of undertaking outdoor personal projects important to
individuals is associated with greater life satisfaction, particularly for nature-related projects. **Keywords:** Outdoor Activities; Life-Satisfaction; Wellbeing; Quality of Life.

**Exercise and subjective well-being in old adults**

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**Introduction:** The aging process leads to the decline of functional and psychological capacities and consequently of Subjective Well-being. Increasing evidence suggests that physical activity can prevent some psychological aspects in older people. Self-esteem has emerged as a strong indicator of Subjective Well-being and physical self has demonstrated important correlations with self-esteem. Assess of physical self-perceptions in older adults has been little investigated. This study aims to determine the influence of exercise on Subjective Well-being in elderly. **Method:** Participants were physically independent and cognitively healthy elderly. Subjective Well-being, Self-esteem, and Physical Self-perception were evaluated to an exercise and a control group. **Results:** Participants (N = 1475) were mean aged 73.77 years (+ 7,10). After 14 weeks of exercise program, intervention group increased their mean scores for RSES (p < 0.00) and for most PSPP-VCR sub-domains (Function, Physical Health, Physical Strength, Sport Competence). Inversely they had lower mean scores for Body (p < 0.05). **Conclusion:** Physical exercise has positive benefits on self-esteem and physical self-perceptions associated with functional capacity of elderly. Conversely exercise has low influence on their positive feelings about their own image. **References:** Fox, K. (2000). The effects of exercise on self-perceptions and self-esteem. In Physical Activity and Psychological Well-Being (pp. 89-117). London: Routledge. Fox, K. R., Stathi, A., McKenna, J., Davis, M. G. (2007). Physical activity and mental well-being in older people participating in the Better Ageing Project. European Journal of Applied Physiology, 100(5), 591-602. **Keywords:** Wellbeing; Exercise; Cognition; Self-Esteem.

**Actively participating in leisure activity can contribute to better health-related quality of life (HRQOL) of community dwelling elders in Hong Kong**

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*Elderly Health Services, China.*

**Background:** Activity theory stresses the positive linkage on activity and quality of life of individuals. This study aims to examine whether the changes in leisure participation over 2 years are associated with changes in HrQOL of community dwelling elders. **Method:** 350 elderly were randomly selected and interviewed through telephone in Elderly Health Centre in 2006 and 2008. HrQOL was measured using SF12. Leisure participation was assessed by participating in eighteen types of activities which were categorized as recreational (RA), cognitive (CA), social (SA) and productive activity (PA). Frequency of leisure participation was measured on a 5-point scale. Regression analysis was used to examine the association baseline and follow-up scores after adjustment for socio-demographic variables. **Results:** Over the 2 years, increase in SA was significantly associated with higher scores of all domain of SF12 i.e. physical functioning (p < 0.001,95%CI 0.89-3.03), role physical(p < 0.01,95%CI 0.36-2.38), body pain (p < 0.05,95%CI 0.26-2.48), general health (p < 0.01, 95%CI 0.42-2.32),vitality (p < 0.05,95%CI 0.12-1.86) social functioning (p < 0.05,95%CI 0.08-2.02),role emotional (p < 0.005,95%CI 0.54-2.08),and mental health (p < 0.05,95%CI 0.06-1.29). Moreover, CA was positively associated with physical functioning (p < 0.05,
95%CI 0.02-1.20), role physical (p < 0.05, 95%CI 0.06-1.90) and general health (p < 0.05, 95%CI 0.12-1.85) while RA was positively associated with role physical (p < 0.05, 95%CI 0.10-2.58) and mental health (p < 0.05, 95%CI 0.003-1.58). However, participation in PA was not found to have association with any domains. **Conclusion:** Continuing to participate in leisure activity could contribute to better HrQOL. It could promote both the physical and psychosocial benefits for the elders. These benefits not only cultivate the HrQOL at baseline, but also cumulate during the follow-up period. Therefore, leisure activities should be promoted so that more elders could enjoy better quality of life in their old age. **Keywords:** Leisure Activity; Quality of Life; Cognition.

**Physical activity and quality of life in aged women**
Serrano-Sanchez, Jose A1; Lera-Navarro, Angela2; Luzardo-Henriquez, Laura3; Espino-Torón, Luis3
1University of Las Palmas de Gran Canaria ULPGC, Spain; 2University of A Coruña, Spain; 3Cabildo de Gran Canaria, Spain.

The purpose of this study was to examine associations of the amount and type of physical activity (PA) with functional fitness (FF), depression, quality of life (QoL) and morbidity in aged women (^65 years-old). The Senior Fitness Test, walking velocity, and static balance were assessed in 357 non institutionalized women (Gran Canaria’s PA Study, Spain). Participants were interviewed using validated questionnaires to assess organized and unorganized recreational PA, depression (CES-10D), QoL (EQ-5 D-5 L), and morbidity (National Health Questionnaire). Tertiles of PA amount and 3 categories of PA type (sedentary, unorganized, and organized) were used as outcome measures. Differences among PA tertiles and type categories were examined with ANCOVA, with age and BMI as covariates. Significant differences (p < 0.05) between 1st and 3rd PA tertiles were found in all FF dimensions (n = 7) and CESD-10D’s index, EQ-5D’s index, perceived health and most morbidity-related dimensions (n = 7). Size effect differences between 1st-3rd PA tertiles ranged between 10-38% in FF, 9-32% in depression and QoL, and 23-35% in morbidity. When examined differences between 1st-2nd PA tertiles, a reduced number of significant differences (n) and lower size effects (%) were observed in FF (n = 4 dimensions, 4-10%) and morbidity (n = 1, 19%), whilst the associations remained significant in all measures of depression and QoL (5-25%). Between 2st-3th PA tertiles, only 2 dimensions of FF remained significant and none in depression, QoL, and morbidity. Organized vs. unorganized PA type was relevant for better FF, showing no differences for depression, QoL, and morbidity. Most differences associated to organized PA were due to a higher PA level. Results indicate a higher potential from organized compared to unorganized PA for enhancing health, quality of life, and fitness in aged women. **Keywords:** Physical Activity; Quality of Life; Senior Fitness Test; Walking Velocity; Aged Women.

**What does it mean to be getting older for sedentary and active older adults?**
Addamo, Patricia K1; Borkoles, Erika2; Polman, Remco3
1Institute of Sport, Exercise and Active Living (ISEAL), Australia; 2School of Sport & Exercise Science & ISEAL, Australia; 3Victoria University, Australia.

**Background:** Being physically active throughout life has implications on how well we age. How individuals conceptualise the implications of their active or sedentary lifestyles on the
aging process is poorly understood. This work aims to address this issue and provide insights into how to help inactive older adults to be more active and maintain their quality of life. **Aim:** To consider how an active or sedentary lifestyle influences the lived experience and quality of life of getting older. **Methods:** Participants were older adults (age range 60-80 yrs); 10 master athletes and 10 sedentary adults. Semi-structured interviews were conducted in accordance with the tenets of Interpretative Phenomenological Analysis. **Results:** The concept of ageing and feeling old was markedly different between the two groups. Active older adults defined ageing by functional ability and the amount of energy they had for daily living and independence. They took pride in their capable bodies, but recognised the functional limitations of ageing. Getting slower was prominent in their narratives. Sedentary adults defined ageing by ‘brain activity’ and maintenance of mental abilities. For them old age started when illness set in and functional ability restricted their activities of daily living, which seem to occur earlier compared to the active adults. Sedentary adults concentrated on puzzles, studying, reading, and engaging in activities that increase mental power, as if to say, the body has given in, the best next option to focus on maintaining mental abilities to avoid getting old. **Conclusion:** The narratives of active and sedentary individuals from this study provides invaluable understanding of the definition of ageing and how older adults set their challenges in this later phase of life. The study outcomes should inform the development of future interventions in sedentary older adults. **Keywords:** Sedentary; Mental Abilities; Cognition; Daily living; Independence.

**Brain training through physical exercises for older adults**

*Hartmann, Herbert; Regelin, Petra*

*German Gymnastic Federation, Germany.*

Scientific findings give ample evidence, that specific physical exercise can have positive effects on the function and the structure of the brain (1). But not every exercise program has positive effects on the brain; and not all physical exercises have the same effect on the functioning of the brain. In study from the Jacobs University Bremen older adults (65 - 75 years) had been trained in three different exercises programs (2). From this study we can assume: Physical exercises provoke only positive effects on the brain if the exercises are so exertive that they have metabolic effects. Endurance activities and coordination training have positive effects on the brain; but stretching and stress relaxation training have no effects. Coordination training seems to improve the abilities of the visual and steric perception. This kind of training will improve the quality of thinking, and thinking will be more exact. Positive effects on the brain can be assumed as well through muscle training. Taking these findings into consideration the German Gymnastic Federation (DTB) developed in cooperation with the Jacobs University Bremen a training program to be carried out in sport-clubs through specially educated instructors for the target group of aging people. This program includes endurance-, coordination, and dual-tasking training. The presentation will give a short overview on the theoretical background of the effects on the brain through physical exercises at first. Afterwards the practical training program will be outlined. Finally the experiences after one year of implementation will be discussed. **References:** 1. Kramer, A.F./ Erickson 2007. Capitalizing on cortical plasticity: influence of physical activity on cognition and brain function. In: Trends in Cognitive Science 11 (8), 342-348. 2. Voelker-Rehage, C., Godde, B., Staudinger, U.M.,2010 **Keywords:** Brain Training; Physical Exercise; Older Adults; Implementation; Cognition.
Practical Workshops

IMPROVING THE HEALTH AND WELL-BEING OF OLDER PEOPLE THROUGH THE ARTS

Cutler, David1; Beard, Keith2; O’Neill Mark3; White, Kirsty4; McEwan Gulliver, Barbara5

1The Baring Foundation, UK; 2Art in Hospital, UK; 3Glasgow Life, UK; 4Glasgow Arts, UK; 5Gardiner Institute, Western Infirmary, UK.

This presentation will highlight recent practice and evaluation in the arts and older people in the context of health and community care from 3 different UK perspectives. Active Ageing is not just about physical activity but also about improving mental health and well-being for older people through creative activities and engagement. The ageing population is increasing and the quality of life for older people is of increasing social and political concern. The presentation will demonstrate through the case studies that access and participation in arts and culture improves health and well-being and quality of life for older people, promoting the arts as a key dimension of active ageing. The 3 Case Studies are: 1: The Baring Foundation The Baring Foundation has committed itself to a five year programme throughout the UK to promote the importance of participatory arts for older people with an emphasis on vulnerable older people. The Foundation has published three reports, including a review of the research evidence of the impact of participatory arts on the lives of older people. 2: Art in Hospital “It is now recognised that the artist’s role is crucial in the overall care of patients” Research and evaluation has shown that participation in the arts improves quality of life and affects patient outcomes in rehabilitation and assessment, stroke rehabilitation, dementia and long term care for older people 3: Glasgow Life The research on the health benefits of intensive engagement with creative and cultural activities led by artists is well recognised in the literature on cultural impact. Less recognised is an emerging field of epidemiological research on the health impact of ‘general cultural attendance. Keywords: Health; Wellbeing; Active Ageing; Community Care; Creative Activities.

EMPOWERMENT OF AGEING PEOPLE COMBINING PROFESSIONAL CARE, SELF-SUPPORT AND SOLIDARITY BETWEEN GENERATIONS AND CULTURES

Witter, Yvonne1; Kooyman, Michiel2; van der Bent, Edith2; Krull, Imre2

1Aedes, Netherlands; 2ActiZ, Netherlands.

The Netherlands are confronted with an increasing number of older citizens, often suffering chronic diseases. 76% of the people older than 65 years have one or more chronic disease. These figures predict a growing need for care and special housing. But we have to meet these needs with a decreasing number of younger and fewer caregivers. We have to introduce the benefits of healthy ageing, by empowering people to take care of themselves and others. Solidarity between generations and cultures is our goal. Every citizen has to take responsibility. People, who age in a healthy manner and help others, will lead more valuable lives. This effort is one of the cornerstones of ActiZ’ long-term strategy ‘Towards autonomy, solidarity, and healthy living’. The OECD study ‘Help wanted. Providing and Paying for Long Term Care’ 2011. What we aim for is a shake-up of citizens and politicians. A great change is needed in the organisational and financial support of professional care, welfare, and housing of elderly people. Caregivers need to become aware of the fact that their focus needs to be on how to support people in ageing in a healthy manner and taking care of themselves (physically and mentally) also by organising their own network. Cooperation is
the keyword and creates a win-win situation (Tjadens, Colombo: Long term care; valuing care providers, Eurohealth 2011, 17). We want to share our knowledge and field experiences with others. We want to do this by showing a film ‘more than forgetting’ and discussing its topics. The film is about a family originally from Turkey and the other from Surinam. They live in the Netherlands and take care of their parent with dementia. They deal with taboos, feelings of guilt. It shows intergenerational and intercultural aspects and also the relation between informal and professional care. Furthermore, we would like to give a presentation of the results of an international comparative study of informal and formal care. We want to share and discuss the results. Keywords: Dementia; Chronic Disease; Ethnic Minority, Caregiver; Intergenerational and Intercultural Aspects.

TECHNIQUES AND SKILLS FOR EXERCISE DELIVERY TO PEOPLE LIVING WITH DEMENTIA

Hoffmann, Edye.

dementiaCOMPASS, United Kingdom

Confidence in exercise instruction and delivery can impact successful outcomes with people with dementia, their carer, and the exercise instructors themselves. Understanding perceptions and abilities of both the person with dementia and carer can improve an instructor’s delivery leading to retention and sustainability, especially in the community. This workshop will encourage participants to discuss some of the perceptions around exercise and dementia before we consider real-life case studies to highlight effective teaching techniques including advice for communicating with people with dementia, and then we will consider environmental adaptations toward a successful exercise experience. Participants will receive handouts describing teaching techniques and worksheets for evaluating recruitment and marketing. Keywords: Dementia; Exercise; Communication; Environmental Adaptation; Training of Professionals.

SEMINARS FOR WORKFORCE EXPLORING IMPACT OF DEMENTIA ON INDIVIDUAL & FAMILY USING DRAMA & DVD METHODS

Lowrie, Sheena¹; Borrowman, Fiona².

¹NHS Lothian, UK; ²NHS Health Scotland, UK.

Local partnerships were developed between NHS Health Scotland, Alzheimer Scotland, Scottish Dementia Working Group (independent group of people living with dementia), NHS Boards, Local Authorities and local voluntary sector organisations to develop a participative seminar to explore concept of ‘Living well with Dementia’ at a local level and to launch a new DVD resource. Six regional seminars took place during 2011/12, reaching an audience of over 420 people including a specialist seminar for deaf community. Workshop will describe the process of developing the seminars and the use of the innovative drama ‘Seeing Auntie’. It will explore use of drama and DVD to raise awareness with health and social care workforce about the impact of diagnosis and living with dementia on individual and family. The drama also highlights the importance of physical activity for the person with dementia and encourages promotion of physical activity in variety of care settings. During the workshop: 1) Presentation of the drama will take place and participants will have chance to experience this powerful medium and exploration of the subject matter; 2) Presentation on process and evaluation of six seminars in number of settings across Scotland including community and voluntary staff and NHS acute setting; 3) Workshop will conclude with
facilitated discussion on use of this drama production in training and awareness rising on dementia and promotion of physical activity. Evaluation of the seminars has been positive. Comments on seminars include: ‘Greater understanding of advantage of early diagnosis and the need for better awareness of dementia issues’ “Raised my awareness of the needs of people with dementia” Specific comments on drama ‘Seeing Auntie’ are: ‘Seeing Auntie’ was a fantastic way of sharing how dementia affects the whole family” “Thought that the ‘Seeing Auntie’ theatre production was extremely thought provoking and emotional. Brings it to life!” Keywords: Dementia; Alzheimer; Physical Activity; Awareness; DVD.

CHAIR BASED EXERCISE: STILL MEETING NEW PHYSICAL ACTIVITY GUIDELINES
Baker, Cherry
Later Life Training Ltd, UK
Chair-based exercise has been shown to have beneficial effect at maintaining or promoting independence and mobility in older people. However, if possible, seated exercise should be progressed to standing exercise to make it more functional and to improve balance and strength so that the older person can reduce their risk of falls and widen their social reach. In order to ensure that chair-based exercise can still achieve the aim of meeting physical activity guidelines for older people (ie. moderate physical activity, strength and balance work) Later Life Training have ensured that their Chair-based Exercise Leaders course delivers training on exercises that not only meet this evidence base but have been used in published research. The workshop will discuss briefly the evidence base behind the course and then will lead participants through the exercises and the motivational messages that can be given to support adherence.

CHANGING THE WAY WE AGE
Milner, Colin.
ICAA, United States.
Population aging is creating a tidal wave of change within many industries, governments, communities, businesses and families. What impact are these sweeping changes having on the fitness and wellness industry? And, how can you profit from them? By attending this forward-thinking session, you will learn about how the accumulation effect and the latest research in population aging is changing the way we age, driving the global active-aging movement to unprecedented heights. You will also learn what trends are occurring because of these changes, and how they are changing the way we age.

THE RONNIE GARDINER RHYTHM AND MUSIC METHOD: A WAY TO STIMULATE COGNITIVE AND MOTOR FUNCTION IN THE ELDERLY
Pohl, Petra.
Umeå University, Sweden.
Background: The Ronnie Gardiner Rhythm and Music (RGRM) Method has been implemented with health care and rehabilitation since 1993 in Sweden. The method may stimulate neural plasticity through our natural sense of rhythm, and can be used to help people with brain injuries, diseases of the central nervous system, as well as healthy brains in the elderly or children. The RGRM Method uses multisensory input; visual, audio, kinetic, and tactile,
in combination with energy from rhythm, music, and sound/movement codes. The aim is to stimulate cognitive functions like memory, concentration, executive function, endurance, and dual task, as well as motor function like coordination, mobility, balance, and motor skills. It may also improve self-esteem, body image, and social skills. The RGRM Method has successfully been used in groups with stroke, Parkinson’s disease, depression, A.D.H.D., dementia, autism, dyslexia and in school with children and learning. This method is an important additive to health care for everyone who enjoys music. Implementation: To the sound of cheerful music the leader points at specific schedules that contain, for this method, unique notes shaped as hands and feet in the colours red and blue, symbolizing the right and left side of the body. To each and every note the participants perform a certain movement and use a sound enunciation, in order to activate a multitude of brain structures. The method can be varied in endless ways with different music, speed, schedules, movements, and notes. It can be performed either standing up or sitting down and is practiced with the advantage of a group activity as well as individually. Conclusion: Rhythm and music are powerful tools that influence our brain in many positive ways. The Ronnie Gardiner Rhythm and Music Method may enhance cognitive and motor function, as well as well-being and self-esteem, and is found to be fun and challenging. Keywords: Cognition; Motor Function; Self-esteem; Parkinson’s Disease; Rhythm and Music

FITNESS EQUIPMENT DESIGNED FOR OLDER PEOPLE

Laxåback Gerd; Björkgren, Magnus; Lipsonnen, Anssi; Borg, Frank

Health Sciences Unit, Kokkola University Consortium Chydenius, Finland.

Muscular strength and balance are important factors in determining the fall risk. The Welmed approach to fall prevention strives to address these factors in a systematic way, both in assessing the fall risk, and in fall prevention. The Welmed concept has been developed by the Health Science Unit at the Kokkola University Consortium Chydenius (University of Jyväskylä), and its business partners. Within this concept new tools and models are developed in collaboration with technology companies, service providers, and the public sector. Fall prevention has been one of the targets, and it uses the key procedural idea of an initial assessment followed by a structured intervention followed by a re-assessment. This is in accord with the general philosophy of continuous quality improvement (CQI) where both assessment and intervention methods are continuously reviewed in the light previous experience and by using various sets of quality indicators. On the individual level the re-assessment provides data about the need for further treatment, physical activity prescriptions, or for changes in the rehabilitation goals and methods. Quantitative measures of are of essential importance for the assessment to provide concrete goals for the intervention (such as to increase strength by so and so many percentages), and to motivate the participant to exercise and improve his/her results. In this lecture these quantitative methods are illustrated by strength and balance measurements as part of falls prevention programs.

ACTIVE LIVING THROUGH GERI OLYMPICS: FOR RESIDENTS OF NURSING HOMES—25 YEARS

Muilenburg, Ted; Woodrum, Bill; Beane, Todd

West Virginia State University, United States

Geri Olympics Programs have promoted active living, wellness, and quality of life through competitive sports for seniors residing in nursing homes for 25 years. Each year over 150
nursing home resident athletes gather from across our state to compete in various adapted sports. The program involves resident athlete training and practice as well as being a member of a nursing home team in preparation for competitions. Several of the events have been recommended by therapists as a means of improving motor coordination and pulmonary function. Geri Olympics instills a competitive drive in these athletes that gives them a healthy aspect of life for at any age and at any ability. It gives them a way to become involved with the surrounding communities. Geri Olympics also includes an intergenerational component with the inclusion of children in the program as cheerleaders and supporters for the athletes. Geri Olympics promotes overall wellness, but also provides a way of dealing with non-medical issues such as hopelessness, loneliness, and boredom through team practice, preparation, and competition. Many nursing homes involved in Geri Olympics have purchased trophy cabinets to display athletes’ winning trophies and ribbons. Many nursing facilities celebrate their athletes and honour them with a send off committee that cheers as the residents leave for the competition and a welcoming committee that greets them with excitement when they arrive home. Geri Olympics is celebrating its 25 year anniversary this year. From its creation, it has grown to include similar programs in five states and three countries. This presentation is an opportunity to celebrate Geri Olympics Programs and highlight the unique program that is based on best practices of physical activity. Geri Olympics is a program that promotes well-being, quality of life, cognitive functioning, and motivation at any age to participate in active exercise. Participants will learn how to organize a similar program. Keywords: Geri Olympics; Wellbeing; Quality of Life; Nursing Homes; Cognitive Functioning.

DEVELOPING REGIONAL/NATIONAL NORMS FOR THE SENIOR FITNESS TEST: ISSUES, GUIDELINES AND SPECIAL CONSIDERATIONS

Rikli, Roberta; Jones, Jessie

California State University, United States.

Since the development of the Senior Fitness Test (SFT) and its accompanying national normative performance standards for the United States over 10 years ago, there has been considerable interest in how to develop such performance standards in other countries and/or other types of populations. Participants at this workshop will learn (1) unique qualities and uses of the SFT, (2) differences between normative and criterion-referenced standards, (3) procedures for properly administering the SFT, and (4) issues, precautions, and guidelines for developing their own regional/national normative standards in order to assure valid and interpretable outcomes. The SFT was designed to assess the major fitness components associated with independent functioning in older adults across a wide range of ability levels, from the borderline frail to the highly fit. However, the SFT has also been used effectively for younger age groups with various medical conditions. Because of its strong psychometric properties (reliability and validity) and ease of use in both clinical and community settings, the SFT has been widely used throughout the United States and in numerous other countries. Unique features of the SFT are its accompanying normative and criterion standards that can be used in evaluating test results. Normative standards make it possible for people to compare their scores to others their same age and sex. Criterion standards, recently developed for the SFT, indicate for each test item the recommended cut-point score associated with the fitness level needed for performing the kinds of activities required for independent functioning well into later life (aged 90+). These standards provide instructors/practitioners valuable information for evaluating and motivating individuals, for setting goals, and for program planning and outcomes assessment.
Meet-the-Expert Sessions

PLANNING TO LIVE
Barrett, Hazel.
Four Seasons Health Care, United Kingdom

The Dementia Care Team within FSHC have incorporated Person Centred Care Planning into the PEARL Specialised Dementia Care Criteria for the homes embarking on the project and in doing so are challenging staff to write care plans to which allow residents to Live their lives as well as meeting their care needs. Within a workshop, I propose to look at the ways in which we are supporting staff to be more Person Centred when care planning. This includes the assessment process: Gathering information at the pre admission stage, through the first 24hrs following admission and then ongoing assessment. Staff are taught to look at residents views, preferences, likes, dislikes, rituals and routines at all stages of assessment and these can then be incorporated into long term care plans. We also utilise the Pool Activity Level Instrument (Lackie Pool, 2007) in the assessment process, challenging staff to look at life story information and levels of resident’s ability in being active in their own care. The language used in care plans can have a great impact on how staff see the resident, and within FSHC we encourage staff not to use labels or prescriptive phrasing. This includes losing words and phrases such as; aggressive, wandering, settled day etc. We are looking at other formats to allow staff to formulate care plans and one of these is looking at all needs/ interventions as activities and including the following areas in each care plan, therefore planning to LIVE: Led Activities- Individualised Activities- Vocational Activities- Every Day Activities. We actively promote PEARL, Positively Enriching And Enhancing Residents Lives, and strive to support staff in care planning effectively to allow our residents to actively LIVE well with Dementia in our homes. **Keywords:** Dementia; Care Plan; Training of Professionals; Residential Setting.

GROUP CREATIVE ACTIVITIES: POETRY AND IMPROVISED DRAMA FOR THOSE LIVING WITH DEMENTIA
Killick, John.
Consultant, United Kingdom

**Introduction:** People with dementia need stimulation and imaginative activity; without these boredom and depression may cut them off from society. Creating poems in groups is one of the ways to supply what is lacking; collaborating in improvised drama exercises and sketches is another. **Aims and Objectives:** to give participants the experience of both techniques so that they understand both the principles behind them and the steps to be taken to organize them successfully. **Methods:** The group will take part in sample sessions so that they appreciate what is involved, and they will also be provided with written instructions to act as an aide memoire for reproducing the techniques. **Results:** Participants will have the capacity to mount similar initiatives in their work-places and thus enhance a sense of agency in people with dementia coupled with group bonding and relationship-building. **Keywords:** Dementia; Creative Activities; Drama Exercises; Sketches.
MOTIVATE ME: ENCOURAGING UPTAKE AND ADHERENCE TO EXERCISE

Tenn, Trish; Hanna, Simon

Later Life Training Ltd, UK

The Motivate Me (MMe) course, run by Later Life Training Ltd, is designed to provide both theoretical perspectives and practical applications on motivating older people to start and maintain regular physical activity. Motivate Me is an evidence based one day programme that examines in particular the underpinning knowledge of behaviour change. There are a number of models that are used to describe how humans behave and change their behaviour. They help in that they simplify ideas and give us a framework for thinking about ways in which we can operate. In particular, this session will help answer any questions you have about the conversation you want to have with an older person on their barriers, motivators, and beliefs.

NUGGETS OF KNOWLEDGE FROM THOSE WHO REALLY UNDERSTAND: DEVELOPMENT OF “COPING WITH DEMENTIA” AND “LIVING WELL WITH DEMENTIA”—A PARTNERSHIP APPROACH

Walker, Elaine1; Jardine, Kirsty2; Sewell, Martin3; Douglas, Jenny3
1NHS Health Scotland, UK; 2Alzheimer Scotland, UK; 3Scottish Dementia Working Group, UK.

Approximately 84,000 people have dementia in Scotland in 2012. This number is expected to rise to 164,000 by 2036. Key to the support of people with dementia is the availability of high quality information. NICE guidelines recommend that information is tailored to the needs of the individual, culturally appropriate and accessible. Scotland’s National Dementia Strategy (2010) also highlights the importance of information in improving understanding of the benefits of early diagnosis. NHS Health Scotland, in partnership with Alzheimer Scotland and Scottish Dementia Working Group, has produced two DVDs: Coping with dementia and Living well with dementia. They use the voices of people with dementia and carers to: share experience around how to ‘live well’ after diagnosis, providing practical advice on coping with its effects; and suggest where to go for further support. This session will be able to share experiences on involving older people with Dementia in support packages and dissemination. Keywords: Dementia; Alzheimers; Quality of Life; Carers; DVD.

LIFE STORY WORK IN DEMENTIA: A SERVICE USER’S EXPERIENCE—“MY LIFE, LIVING WITH DISABILITY AND ALZHEIMER’S”

Ross, Robert1; Walker, Emma2; Kelly, Andrew2
1Service User, UK; 2NHS Greater Glasgow and Clyde, UK.

Life story work is being increasingly used within dementia services to foster person centred reminiscence and active engagement in the disease process. Despite this, there is a lack of freely available, detailed examples of life story work for staff and patients to draw upon for ideas when developing individually tailored life stories. This poster provides extracts from a Life Story Book that a patient developed alongside his family, friends and professionals involved in his care. In addition it provides a detailed description of how the Life Story Book was developed. It also details the positive impact completing the book has had on the patient and his family in terms of the reminiscence it has encouraged and how it has prompted the
patient to consider the type of meaningful activities he wants to engage in and the services that he expects to access. Finally it includes reflections from the professionals involved about the piece of work and its wider implications for adjusting to ageing and degenerative illness. **Keywords:** Dementia, Ageing, Quality of Life, Life Story.

**SINGING TO FACILITATE SOCIABILITY AND WELL BEING IN PEOPLE WITH DEMENTIA**

Topaz, Rona

*Consultant, United Kingdom.*

Alzheimer Scotland recently introduced a series of classes called “Singing For The Brain” which involves a singing workshop facilitator leading a series of singing workshops for people suffering from dementia and their carer in a range of well known songs. Lyric sheets and backing tracks are used, although some songs are unaccompanied. My proposal as a freelance singing facilitator is to put together a scratch choir to rehearse perhaps two songs to be performed at the conclusion of the event. **Keywords:** Dementia, Alzheimer, Wellbeing, Quality of Life.

### Posters

**ASSOCIATIONS OF LEISURE, DOMESTIC, AND WORK-RELATED ACTIVITIES WITH INSOMNIA AMONG TAIWANESE OLDER ADULTS**

Chen, Li-Jung⁴; Ku, Po-Wen⁵; Sun, Wen-Jung⁶

⁴National Taiwan University of Physical Education and Sport, Taiwan; ⁵National Changhua University of Education, Taiwan; ⁶Taipei City Hospital Zhongxing Branch, Taiwan

**Introduction:** This cross-sectional study was designed to examine the link between leisure, domestic, and work-related activity and insomnia among older adults in Taiwan. **Methods:** A total of 2295 older adults (65+) in Taiwan participated in this study through face-to-face household interviews in 2009. Physical activity was evaluated with the Physical Activity Scale for the Elderly, comprising 12 components pertaining to leisure, domestic and work-related activity over the past seven days. Scores of leisure and domestic activity were categorized into tertiles: low, moderate and high. Work-related activity was grouped into two levels (low and moderate) due to the small number of working participants. The definition of insomnia used criteria of DSM-IV: participants experienced poor sleep quality, moderate degree or above of daytime dysfunction and difficulty falling asleep at least 30 min after going to bed or difficulty maintaining sleep or early morning awakening at least three times a week over the past month. After adjusting for socio-demographic variables, lifestyle behaviours, health status, Mini-Mental Scale Examination and Geriatric Depression Scale, the multivariate logistic regression model for predicting insomnia was undertaken to compute adjusted odds ratios (AOR) for the three types of physical activities. **Results:** The results showed that 15.7% of older adults were at risk of insomnia. Low level and moderate level of leisure activity were predictive of increased risk of insomnia in older people (AOR: 1.52, 95%CI: 1.20-1.92; AOR: 1.70, 95%CI: 1.34-2.17; reference: high). However, a low level of domestic activity was significantly related to decreased risk of insomnia among older adults (AOR: .73, CI95%: .56-.95; reference: high). **Conclusions:** This study demonstrated that insomnia is prevalent among Taiwanese older adults. It indicated that leisure and domestic...
ASSOCIATION OF OBJECTIVELY ASSESSED PHYSICAL ACTIVITY WITH MENTAL WELL-BEING AMONG OLDER ADULTS

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Introduction: This study examined the relations between physical activity assessed by the accelerometer and mental well-being among older adults in Taiwan. Methods: A total of 307 older adults (Male/Female = 103/204; age = 74.56±6.10) were interviewed by face-to-face surveys in 12 community centers for the elderly in Taiwan. Mental well-being, comprising 7 dimensions: physical, psychological, independence, learning & growth, material, environmental, and social well-being, was assessed by the Chinese Aging Well Profile. Subscale mean scores were computed for each dimension, ranging between 0 and 5 and the general well-being was calculated based on the total scores of the 7 subscale means. Participants wore tri-axial accelerometers (ActiGraph GT3X+) for 7 days to determine energy expenditures, which were grouped into 3 levels (LPA: 0-499, MPA: 500-999, HPA: 1000+ kcal/week). After adjusting for gender, age, educational attainment, marital status, religious belief, smoking, drinking, BMI and number of chronic diseases, eight multiple linear regression models for predicting general well-being and 7 dimensions of well-being were performed to estimate standardized regression coefficients (β) for physical activity (α = 0.05). Results: With multivariate adjustment, participants with the highest (HPA: β = 0.32) or the middle levels of physical activity (MPA: β = 0.16) possessed elevated levels of general well-being, as compared with a lowest level of activity. Similarly, physical activity was significantly associated with several dimensions of well-being, such as physical (HPA: β = 0.28, MPA: β = 0.17), psychological (HPA: β = 0.23), independence (HPA: β = 0.39, MPA: β = 0.25), learning & growth (HPA: β = 0.22), and social well-being (HPA: β = 0.15). Conclusions: Physical activity may have benefits for improving mental well-being in older adults. Given that the data is cross-sectional, well-designed prospective cohort studies are warranted in the future. Keywords: Physical Activity; Wellbeing; Mental Health; Taiwan.

PHYSICAL ACTIVITY AND COGNITIVE FUNCTIONING OF OLDER PEOPLE WITH DEMENTIA

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Introduction: Dementia is one of the major health problems among the older people. There is a significant increase in the number of older people diagnosed with dementia worldwide. The situation is reported to affect the healthcare, financial, and policy-making strategies in countries. Physical activity participation is supported to improve the cognitive function among older people with dementia. The purpose of this study is to examine the impact of physical activity on the cognitive functioning among older people with dementia. Method: A systematic review on the literature related to “physical activity” and “cognitive functioning” of older people diagnosed with dementia were conducted. Thematic analysis was adopted for data analysis and results were summarized. Results: Physical activity was recognized to show positive effect on reducing the risk of cognitive deterioration among dementia people. The risk of cognitive impairment was negatively associated with increasing physical activity.

Keywords: Dementia; Cognitive Functioning; Physical Activity; Taiwan.
activity participation. Also, physical activity participation demonstrated improved memory and attention condition. Moreover, older people with intensive regular outdoor physical activity were found to have decreased prevalence of dementia. **Conclusion:** It is concluded that physical activity is a well-documented approach that benefits the cognitive functioning among older people with dementia. Thus, regular physical activity is recommended as a non-pharmacological method to improve the cognitive functioning of the targeted population. **Keywords:** Dementia; Cognitive Function; Physical Activity.

**A PROSPECTIVE ASSESSMENT OF THE INTENSITY OF DAILY PHYSICAL ACTIVITY NECESSARY FOR MAINTAINING EXECUTIVE-COGNITIVE FUNCTION**

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The present study conducted a two-year prospective assessment to define the intensity of daily physical activity that would have a favorable influence on executive cognitive function. 72 people over the age of 60 participated in this study. They wore an electronic accelerometer throughout their waking hours for three months for assessments that took place during the following year. This recorded the number of steps per day and the duration per day as one of ten intensity levels (0.5, 1 to 9). Executive cognitive function was evaluated with a Task-Switch reaction time (RT) test in the baseline and follow-up year. % RT increase (%SwRT) and correct response rates (%CrctRT) in the switch RT trial were considered to study the year related change (or aging decline) of the executive function. Within this study, multiple regression analyses detected the amount of light physical activity (<3METs) as an independent variable which had a positive correlation with the year related difference of %CrctRT. Moreover, the amount of moderate physical activity (>4METs) was detected as the factor which negatively correlated with the year related difference of %SwRT. The present study suggests that moderate physical activity in daily life contributes to the maintenance of executive function, and more specifically neurocognitive processing speed. **Keywords:** Cognitive Function; Physical Activity; Accelerometer.

**CROSS-SECTIONAL RELATIONSHIPS BETWEEN PHYSICAL FITNESS AND PSYCHOLOGICAL HEALTH AND COGNITIVE FUNCTION IN ELDERLY JAPANESE ADULTS**

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Maintenance of cognitive function is of great importance for reducing the risk of dementia in elderly people, and it has been argued that maintenance of physical fitness makes an important contribution to the realization of this goal. The present study examined the cross-sectional relationships between physical fitness and psychological health and cognitive function in elderly people. The participants included 57 male (mean age 72 years) and 64 female (mean age 70 years) Japanese people. Inclusion criteria included: aged >60 years, willingness to participate, and an absence of chronic disease and pain. The participants gave written informed consent for participation in this institutionally approved study, after the protocol, stresses, and possible risks had been fully explained. Physical fitness was determined based on preferred and maximal walking speeds and peak handgrip strength. Psychological health and cognitive function were assessed using the Geriatric Depression Scale (GDS), the Philadelphia Geriatric Center Morale Scale (PGC-MS), the Mini Mental
State Examination (MMSE), the Benton Visual Retention Test (BVRT), and the Task-Switch Reaction Time Test (TSRTT). After controlling for age and sex, preferred walking speed was significantly correlated with GDS, PGC-MS, and TSRTT scores. Likewise, significant correlations were observed between maximal walking speed and GDS, PGC-MS, MMSE, and TSRTT scores. However, there were no significant correlations between peak handgrip strength and any variables of psychological health and cognitive function. The results of this study suggest that psychological health and cognitive function are well maintained in elderly individuals with a higher level of physical fitness, especially walking ability. **Keywords:** Fitness; Psychological Health; Cognitive Function; Elderly; Dementia.

**A FEASIBILITY STUDY TO PLACE A PHYSIOTHERAPIST IN A RETIREMENT VILLAGE TO IMPACT ON HEALTH, WELL-BEING AND ACTIVITY OF OLDER PEOPLE**

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**Aim:** To determine the potential benefits and cost effectiveness of introducing a physiotherapist into a retirement village to proactively manage residents who are independent, as well as those who are receiving care and require therapeutic input. **Background:** It is known that increasing physical activity in older people can impact positively on health and well-being. From July 2011 a clinical specialist physiotherapist for older adults has been assigned one day per week for one year to a 300+ place retirement village in Sheffield. Approximately 200 residents aged from upwards of 55 live there independently. Village facilities include a small gym and a range of scheduled activities such as dancing or exercise classes. It is not known if placing a physiotherapist in the Village could improve well – being, quality of life and reduce demand on health services. **Design:** All residents received notification that they could make an appointment to see the physiotherapist regarding their general health and well-being, staying fit and independent, and getting fitter. A consent form was signed in order to access their medical records. Assessment, advice and intervention was individualised for each resident. This feasibility study will compare outcome measures pre and post physiotherapist interventions. **Outcome measures:** TURN180, EQ-5D-5L, Physical activity min per week, Number of Falls, Number of hospital admissions, Number of ECP call outs, Number of GP visits. **Findings after 6 months:** Assessment of 61 residents revealed: 80% had impairment of balance or had fallen; Only 1 performed moderate physical activity 150 min per week; 2 were inappropriate and 6 were referred on to other services; The majority had not been well informed about their long term conditions. **Plan:** To complete the intervention period and review outcome measures against aims of project. To establish key messages and potential areas of research. **Keywords:** Physiotherapist; Wellbeing; Activity; Physical Activity; Cost; Quality of Life.

**EFFECTS OF PHYSICAL EXERCISE WITH DUAL TASK ON ATTENTIONAL AND CENTRAL PROCESSING SPEED IN PATIENTS WITH ALZHEIMER’S DISEASE**

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Patients with Alzheimer’s disease have deficits in attention, especially divided attention, used to perform the dual task. Exercise has been used as an alternative non-pharmacological treatment to reduce the disease progression. The purpose of this study was to investigate the effects of an intervention program with dual task on attentional in patients with Alzheimer’s disease. The sample included 30 subjects divided in 2 groups, motor intervention group (MIG) and control group (CG). In the MIG, 14 patients (12 women and 2 men aged 78.57 ± 7.13 years) trained for 4 months, 3 times a week. Regarding CG, 16 patients (12 women and 4 men, aged 77.00 ± 6.29 years), kept their routine activities, but did not participate in any physical activity program. To assess attention and central processing speed was used the Symbol Search subtest from the Wechsler Adult Intelligence Scale-III (WAIS-III), before (PRE) and after (POST) training. An U Mann-Whitney and Wilcoxon test were applied (p < 0.05) to statistical analysis. The results are showed in median (minimum-maximum): number of right answers to CG at PRE was 7 (3-11), 6 (3-15) at POST and to MIG at PRE was 7 (2-11) and at POST 10 (6-12). Number of wrong answers to CG at PRE was 1 (0-4), 1 (0-4) at POST and to MIG at PRE was 1 (0-3) and at POST 1 (0-2). To the difference between right and wrong answers to CG at PRE was 6 (2-10), 4 (2-15) at POST and to MIG at PRE was 6 (0-10) and at POST 9 (4-12). The statistical analysis showed a significant difference at POST moment between MIG and CG to the number of right answers (p = 0.004) and in the difference between wrong and right answers (p = 0.004). The Wilcoxon test showed significant difference between PRE and POST to MIG in the number of wrong answers (p = 0.023), and in the difference between wrong and right answers (p = 0.003). We conclude that the dual task physical exercise intervention was effective to improve attention in elderly patients with Alzheimer’s disease. Keywords: Alzheimer’s; Physical Activity; Attention; Central Processing.

MOBILITY AND SAFETY OF ELDERLY DRIVERS AND PEDESTRIANS: A REVIEW OF INTERVENTIONS AND TRAINING PROGRAMMES

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IFSTTAR, France

Safe mobility during ageing is essential to the sustained engagement in social and everyday activities. International accident statistics reveal that elderly drivers and pedestrians are an extremely vulnerable road user group. The aim of the European project SaMERU (Safer Mobility for Elderly Road Users) is to examine all aspects of road safety regarding elderly road users and to produce recommendations for actions that could be taken by local authorities to reduce accident risk. Training older road users is one of the safety measures the project is interested in. Specific interventions and training actions have been proposed and/or tested by researchers, national governments, or local authorities, in order to help older road users to cope with the progressive mismatch between their declining abilities and the large demands of driving and road crossing tasks. Among the most efficient actions for improving driver safety is the combining of repeated practice in real or simulated environments with educational intervention. Exercise alone was shown to enhance several physical abilities, as well as perceptual and cognitive skills relevant for driving. Cognitive training reduces and prevents the declining of cognitive performance by targeting specific skills involved in driving. Most of the data in the literature is related to elderly drivers but studies investing elderly pedestrians are growing. Recently, a training programme combining behavioural and educational interventions showed promising results for improving older people’s safety during road crossing. Moreover, physical exercises revealed a positive effect on older people’s gait and walking speed. In this poster, an overview of interventions and
training programmes improving the mobility and the safety of elderly people on the road will be presented. **Keywords:** Mobility; Safety; Ageing; Exercise.

**QUALITY OF LIFE IN OLDER SCOTTISH ADULTS: THE EFFECTS OF PHYSICAL ACTIVITY**

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Active Communities (AC) is a pilot project designed to increase uptake of physical activity in Scottish populations most at risk of physical inactivity. These populations include older adults. Consultation with various health and social care organisations was undertaken, so that novel physical activity opportunities could be included with existing provision. As part of a multi-faceted evaluation process, the Medical Outcomes Study short-form health survey (SF-12v2) was used to measure the quality of life (QoL) in 68 participants. The SF-12v2 assesses physical functioning, role-physical, role-emotional, mental health, bodily pain, and general health to provide summary scale information on both physical and mental health-related QoL. Both physical component (PCS) and mental component (MCS) scores were produced. QoL is seen as an important component in health promotion activities because it measures self-perceptions giving insight into intervention effectiveness, while reporting on the reciprocal relationship between social and health conditions. It was a possibility that QoL scores would differ between the novel and the pre-existing classes in the initial testing phase because the length of exposure to regular physical activity would vary between the groups. The SF12v2 was imbedded in a survey instrument which was administered to participants across all AC groups. Out of 68 respondents 37 were older adults (aged 55 and over). Of this 37, 15 respondents attended novel classes while the remaining 12 attended existing classes. Findings from paired sample t-tests reported a significant difference between the QoL scores for the MCS scores (p < .005), but no significant difference between the PCS scores (p > .125). These findings suggest that longer term exposure to physical activity opportunities has a positive effect on the QoL and mental health of Older Adults. **Keywords:** Quality of Life; Physical Activity; Mental Health

**THE SUBJECTIVE RESPONSE OF RESIDENTS AND STAFF TO THE INSTALLATION OF HYDRAULIC GYM EQUIPMENT IN A RESIDENTIAL CARE HOME FOR THE ELDERLY**

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A recent local authority initiative aimed at increasing physical activity levels in the elderly has included the installation of hydraulic gym equipment in a number of residential homes. A service evaluation is currently underway in order to assess the impact of this initiative. **Aim:** The aim of this report is to examine the subjective response of staff and residents to the installation of the Technogym Easyline range of equipment into a local authority residential home for the elderly. **Methods:** The Technogym Easyline range is designed for ease of use and employs a hydraulic design which aims to provide individualised and balanced resistance. The residential home in question has installed this equipment, which is currently offered to 23 residents. Classes are held once a week and residents are free to use the equipment ad hoc. Semi-structured interviews were held with a random sample of staff and residents in order to explore the subjective response to this equipment. Open and closed ended questions were used to invite opinion on the suitability of the equipment for
use in the target population and to examine motivations and barriers to use. **Results:** All interviewed residents felt that the equipment was a positive addition to the care home, however just 50% of these had actually used it. Primary benefits cited included “something to do” and “health benefits,” while perceived barriers to use included “it’s not for me” and “it’s too big.” All interviewed staff felt that installation of the equipment would have a positive impact on physical activity levels within the care home residents. **Conclusion:** Although all residents felt that installation of the equipment was a positive addition to the care home, there were a number of barriers cited as to its use. Exploration of these barriers will aid in the development of strategies to combat them, so increasing the accessibility of physical activity interventions to target populations. **Keywords:** Hydraulic Gym; Physical Activity; Residential Home; Elderly.

**WALKING HABITS AND QUALITY OF LIFE IN A POPULATION-BASED SAMPLE OF 75-YEAR-OLDS: MEDIATING ROLE OF OBJECTIVE CAPACITY AND SELF-REPORT HEALTH STATUS**

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**Background:** Physical activity is suggested to be positively associated with various aspects of quality of life (QoL) and has become a key outcome in interventions in older adults. **Purpose:** To examine the relation between walking habits and QoL in 75-year-olds, and the mediating role of objective physical capacity and self-reported physical and mental health status in a hypothetical relation between walking habits and life satisfaction. **Methods:** A cross-sectional representative population-based sample of 75-year-olds from Gothenburg, Sweden, was examined (n = 698, response rate 61%). Walking habits were assessed as weekly frequency and duration. Life satisfaction was assessed with a single item and health status with the Short Form-36. Functional capacity was assessed with maximal and self-selected gait speed, chair-stand, stair-climbing capacity, grip strength, and one leg stance. **Results:** Walking habits were found to be positively associated with life satisfaction and in women also with self-reported physical health status. Self-reported, but not objective, physical health status mediated the relation between walking habits and life satisfaction in women. **Conclusions:** Self-perceived physical-health status seems to have a role as a mediator in the relation between walking habits and life satisfaction in older women. **Keywords:** Walking; Quality of Life; Mediating; Physical Activity; Mental Health

**EFFECT OF FREQUENCY OF KNOWLEDGE OF PERFORMANCE IN ACQUISITION OF THE BASKETBALL FREE THROW IN OLD AGE**

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**Introduction:** Motor learning researchers have been devoted to analyze which factors may affect the acquisition of motor skills, with particular emphasis on feedback and practice. It is known that the Knowledge of Performance (KP) has the function of guiding the learner’s attention to critical aspects of the movement pattern. Considering that attention and memory can become a problem in old age. **Objective:** the objective of this study was to investigate the effect of frequency of KP in elderly individuals during the acquisition of the basketball free throw. **Methods:** Sixty active men and women aged 60-69 years of age, divided into
three experimental groups received 100%, 66%, and 33% KP frequency during three practice sessions with 90 attempts. The task was the basketball free throw. Volunteers were asked to conduct tests of retention and transfer 24 hours after the last practice session. During the acquisition phase, the volunteers received KP on the movement pattern on the previous attempt; this information was obtained from a qualitative hierarchical checklist of the free throw (14 items). Sessions were recorded in order to confirm whether volunteers were able to score throughout sessions. Results: ANOVA indicated that all individuals showed an improved performance in the retention and transfer tests. But the 66% KP group was superior in both qualitative (movement pattern) and quantitative (score) measurements throughout the trials. Conclusion: In conclusion elderly people seem to need an optimal KP frequency supply during the learning process. Keywords: Knowledge of Performance; Memory; Motor Skill; Acquisition.

“BUMS OFF SEATS” WALKING INITIATIVE IN FIFE: ITS SOCIAL RETURN ON INVESTMENT

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‘Bums off Seats’ (BoS) is Fife Council’s award winning walking Initiative which provides short, safe, low level local led walks. The programme attracts a high percentage of older participants. Now ten years old, the programme is led by volunteer walk leaders recruited from the local community. BoS provides training and ongoing support to the volunteer leaders who provide a social opportunity aimed at increasing activity levels and building confidence to maintain an active life. Recently, Fife Council undertook a Social Return on Investing (SROI) analysis with the Dunfermline walking group as part of the ‘Greenspace is good … so prove it!’, a Big Lottery supported project run by Greenspace Scotland. The aim of going through this was to show the worth of this community project to partners and funders. Dunfermline was chosen as this was the first walking area in Fife and the first to be given grant funding from ‘Paths For All’, the national charity which promotes walking in Scotland. The process was a retrospective evaluation of the previous two year period in the Dunfermline BoS health walk and involved a series of questionnaires given to carers, participants, and volunteer leaders. Some participants also took part in more in depth case studies. As a result of attending BoS health walks participants claimed they had established a social network and made new friends. Some participants also reported improvements or slower rate of decline in physical health issues. All experienced an increased sense of well-being and many felt more positive and confident in undertaking self motivated activities. Volunteer walk leaders experienced the same changes but to a greater extent and felt they had acquired many new practical skills. The headline of an SROI is the development of a ratio which relates the inputs to the social and economic value of the project, and in the case of the Dunfermline walks, a social return of £5.22 for each £1 invested in the project was identified. Keywords: Walking; Physical Health; Wellbeing; Activity; Economic.

THE AUTONOMY IN ACTIVITIES OF DAILY LIVING OF THE ELDERLY IN RESIDENTIAL CARE FACILITIES: PHYSICAL, COGNITIVE AND PSYCHOLOGICAL CORRELATES

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**Background:** autonomy in basic activities of daily-living (ADLs) is fundamental not only for autonomous elderly but also for institutionalized elderly. In fact, the maintenance of residual autonomy of institutionalized elderly promotes the well-being (Kasser and Ryan, 1999; Blair, 1999.) However, effective programs of maintenance of autonomy in residential care facilities must intervene on the specific individual characteristics of the elderly linked to their autonomy in ADLs. **Aims:** to identify the physical, cognitive and psychological correlates of autonomy in activities of daily living (ADL) of a group of institutionalized elderly. **Methods:** thirty-two elderly from different residential care facilities participated in the study (65.5% women, mean age 85 years old, S.D. 6). The SF-36 Italian version (Apolone e Moscovi, 1999), the Mini-Mental State Examination (Folstein et al., 1975), the Tinetti Test (Tinetti et al., 1986) and the BADL scale (Katz et al., 1920) were administered to the institutionalized elderly. **Results:** (1) The cognitive functioning and psychological variables related to emotive status were not significantly related to ADLs scores and they were excluded by the model. (2) The model fits the data perfectly ($\chi^2 = 11.848$, $p = .45$, CFI = 1.0, TLI = 1.0, RMSEA = .00 and SRMR = .00) and shows that ADLs scores are positively associated with the balance ability ($\beta = .65$, $p < .05$) and the perception of physical functioning ($\beta = -.30$, $p < .05$) of the elderly. No associations were found between ADLs score and gait ability and general perception of health status. **Conclusion:** the results underlines that the activities of daily living of institutionalized elderly seems to be mainly associated with the physical functioning, both real and perceived. Programs of maintenance of autonomy in residential care facilities must integrate a physical and a psychological intervention on the body functioning. **Keywords:** Autonomy; Cognitive Function; Residential care.

**RELIGIOSITY AND QUALITY OF LIFE IN OLDER ADULTS: AN INTEGRATIVE LITERATURE REVIEW**

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**Introduction:** Religion can become a strategy to bring meaning to an elderly person’s life, significantly enhancing life experience, allowing people to adopt a new attitude, as well as new emotions, learning, maintaining roles in society, and therefore adding all of these to the general quality of life. **Methods:** This integrative literature review is an investigation about the relationship between religiosity and quality of life (QOL) in the elderly. This research took place during the months of May-July 2011 and investigated databases from PubMed, Embase, the Virtual Health Library (Lilacs, Medline, and Scielo), theses and dissertations from the Coordination of Improvement of Higher Education in Brazil (CAPES). **Results:** A total of 94 studies were identified, of which only 15 met our inclusion criteria. The research types were cross-sectional studies (80%), longitudinal studies (6.66%), focal groups (6.66%) and interventional study with no control group (6.66%). In 86.7% of the studies (n = 13), a positive association between religion and QOL was found; that is, the greater the religious involvement, the better the QOL in various spheres of life. Participants in these studies were less likely to complain of physical conditions, depression, and anxiety. Religious beliefs and practices helped them to cope with depression by increasing sociability, comfort, and strength through faith and belief in God. Among the 15 studies, two reported no association. **Conclusion:** Additional studies of religious intervention on QOL in aged people are needed to understand better this relationship and establish the causal direction of these associations. **Keywords:** Quality of Life; Religion; Depression; Elderly.
PHYSICAL ACTIVITY IN THE TRANSITIONAL PHASE OF OLD AGE: A PHENOMENOLOGICAL INVESTIGATION

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By 2050 eight million people in Britain will be in their 60’s and 12 million will be aged 70+. The growing number of older people has led to increased interest in improving health and wellbeing in later years. Physical activity (PA) can reduce the risk of diseases associated with ageing and maintain quality of life in old age. Currently, activity levels amongst older adults are insufficient to produce health benefits and interventions aimed at increasing PA have not significantly increased participation. One explanation is that interventions fail to recognise the complexity of PA behaviour in older adults. Our study adopted a phenomenological, semi-structured interview approach aimed at giving meaning to the lived experiences of six older adult men and women (aged 65 – 85) participating in a twelve week exercise programme. The setting for our study was a community centre in a rural village in West Yorkshire. Experiences and views of activity leaders responsible for delivering older adult group exercise sessions were also explored. Participants described how physical problems prohibited participation in group exercise. Equally important were emotional issues such as frustration, embarrassment, and anxiety concerning exercise competence and social interaction in the group context. Support from activity leaders in terms of understanding and responding to individual, group, and contextual needs was important in exercise take-up and adherence. Further research exploring older adults’ experiences of PA is recommended to ensure instructors are adequately trained to deliver group activities that meet the exercise requirements of adults in the transitional phase of old age. **Keywords:** Physical Activity; Quality of Life; Physical Activity; Wellbeing.

THE ELDERLY HEALTH RELATED QUALITY OF LIFE: A DYNAMIC SYSTEM STUDY

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The quality of life (QOL) is the subjective perception that an individual has of his/her own existence. Health Related Quality of Life (HRQOL) is a multidimensional construct that consists of indicators of general, physical, functional, psychological health and social activity. The ageing process is associated with a decline in HRQOL, a reduction in autonomy and an increase in welfare costs. For these reasons is important evaluate and implement interventions to maintain elderly active and autonomous. This study aims to understand the underlying processes of the various aspects usually included in HRQOL, and investigate how these aspects operate, modify, and interact among themselves. This goal can be reached through the dynamic systems theory. Thus a dynamic system model is a set of interconnected elements that affects each other over the course of time, changing the trajectories of the output. This study, which is currently in progress, will start with the construction of a theoretical model that will describe the target variables, their interconnections, role on the output, variability, and time span. The conceptual model will be translated into a non-linear mathematical model, that will be used to simulate data. These data will be compared to data drawn from the literature, and tested by collecting empirical data. Empirical data will include objective measures (i.e. daily walking distance, environmental sensors analysis of engage-
ment in activities of daily living) and subjective perceptions of QOL in groups of elderly people. This study will provide an innovative point of view on the construct of HRQOL in elderly people, with the scope to make a model that represents theoretically plausible variables and relations, and generates trajectories that fit with empirical data. The expected results could have an important role for understanding the processes of change in HRQOL in elderly people, allowing to elaborate effective interventions to reduce loss of autonomy. **Keywords:** Quality of Life; Cost; Autonomy; Walking

**BUILDING COMMUNITY ENABLEMENT THROUGH COMMUNITY ENGAGEMENT**

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**Objectives:** To engage with communities capturing local and tacit knowledge of older community members to address issues of Mental Health and Wellbeing in Later Life (MHWBLL) raise awareness of the importance of keeping mentally and physically well and promote community cohesion. **Method:** Within Perth & Kinross the Healthy Communities Collaborative established 16 teams comprising older adults and multi-agency professionals working with specific communities addressing health and social issues. Teams chose MHWBLL as the focus of their work. A learning workshop provided knowledge, information, and skills to impact on this topic in their communities, using the Warwick Edinburgh Mental Wellbeing Scale as a baseline to record improvement. **Outcomes/Results:** The MHWBLL report provided a framework of 5 key focus areas; examples of interventions include Physical health- Monthly health promotion messages, encouraging healthy diet, participation in physical activity including indoor Kurling and local exercise groups. Relationships- Providing opportunities to socialise through meetings, kurling and lunch groups with emphasis on reducing isolation. Poverty- Provision of free energy saving light bulbs, signposting to agencies providing fuel efficiency and benefits advice. Participation in meaningful activity- Promoting inclusion, providing opportunities to attend and be involved in organisation of activities in their local communities. Discrimination- raise awareness of issues of discrimination affecting older people providing access to new technology, Wii interactive computer game, Skype and 1:1 mobile phone assistance. **Conclusion:** This explicitly community led approach has reached right into the heart of each unique locality, enabling older people to be more resilient, empowering them to ensure interventions meet the specific needs of themselves and their peers, raising awareness of the importance of keeping physically and mentally well, promoting community enablement. **Keywords:** Mental Health; Physical Health; Wellbeing; Diet

**ACTIVE AGING AND ITS INCIDENCE IN THE LEISURE EXPERIENCE**

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Active aging is understood as “the process of optimizing opportunities for health, participation, and security in order to improve the quality of life as people” (WHO, 2002:79) sees aging as a positive experience a longer life together with continuing opportunities for health, participation, and security. This concept is based both on the recognition of human rights of older people, as in the United Nations principles of participation, health and safety. In the context of active aging, leisure understood from a humanistic perspective as “satisfactory
experience facilitated by a mental state that allows you to enjoy something that others might not” (Cuenca, 1995:55), appears as an element aging key to a positive experience from three points of view leisure as a fundamental human right, as an integral experience as personal experience that results in different ways or “styles” of experiences. It has been written and reflected on the determinants of active aging since in 2002 the WHO identified six determinants to which there are two additional, cross-cutting (gender and culture). However, a company dubbed “leisure” and in a life cycle stage in which leisure and recreation is of particular importance, little has been done on the role of leisure as a determinant of active aging. Its benefits for humans make this phenomenon in a very important element in the set of determinants that promote healthy aging. Leisure is not only a right of older people, but a personal experience. This involves recognizing that the elderly are not a homogeneous group, not all seniors have the same lifestyle, and consequently not the same style of entertainment. 

**Keywords:** Leisure Experience, Lifestyle, Active Aging

**IS DUAL SENSORY LOSS A RISK FACTOR OF COGNITIVE DECLINE?**

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Prevalence of hearing, visual and cognitive impairments increased with age and has a negative impact on quality of life of older people and their active aging. Recent investigations reveal a possible association between these two sensorial deficits and cognition. However, links remain unclear. 15,465 seniors are living in Galicia nursing-homes. Many of them have important difficulties on activities of the daily living due to their sensorial and cognitive state. However, not investigations have been developed in Galicia to measure the interaction between dual sensory loss and cognition. **Purpose:** To establish if dual sensory deprivation (vision and hearing) impacts negatively on cognition of older people. **Method:** We evaluated 582 seniors (aged 60 years and over). We tested presenting visual acuity (visual acuity with habitual correction) for distance and near vision, as well as hearing capacity (Liminal Tonal Audiometry; air conduction) and cognition of participants (Mini-Mental State Examination, Spanish validated version). **Results:** Older adults with dual sensory loss (DSL) show poorer cognition than those with single or no sensory impairment. Correlation is present with regard to dual sensory deprivation and severity of cognitive decline. **Conclusion:** First results show that sensorial deprivation (vision and hearing) impacts negatively on cognition of older people. **Keywords:** Sensory Loss; Quality of Life; Active Aging; Cognition.

**FIFE’S SEATED EXERCISES FOR THE FRAIL OLDER ADULT COURSE: MEETING LOCAL DEMAND FOR VOCATIONAL TRAINING**

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From 1995, a seated exercise course was run jointly between Fife Council Community Services, St Andrews University and NHS Fife. The course was aimed at support staff working with frail older adults in care homes, hospital wards and day centres. This was considered a high quality course, with over 500 attendees over 12 years. But the course only provided a certificate of attendance, and due to professional development needs in the workplace, there was increasing demand for an accredited course to be provided at a foundation level which would enhance vocational skills. To address this, delivery of the course ceased and a new partnership was formed to review and develop the course. This local partnership included
health (NHS Fife), leisure services (Fife Sports and Leisure Trust), a further education college (Adam Smith) and health improvement physical activity specialists (NHS Fife Health Promotion and Fife Council’s Active Fife). Using the original course as a basis, a three day course was developed at a foundation level and accredited through the College at level 5 within the Scottish Credit and Qualifications Framework, providing 4 credit points. The aims of the course are to equip support staff working with frail older adults with the skills necessary to deliver safe and effective chair based exercise sessions. The course is practical based and delivered by a physiotherapists and a cardiac rehab/exercise referral fitness instructor, with some theoretical elements being provided by external professionals. At the end of the three days, participants are assessed using a multiple choice questionnaire, and are required to demonstrate a physical activity session using the core exercises covered on the course. The course had now been successfully piloted and evaluated and is in its third year of running. Consideration is now being given as to how it can be made available to be delivered in partnership with other local further education colleges in Scotland. Keywords: Care Home; Health; Physical Activity; Physiotherapist; Vocational Training.

MOOD STATES AND FUNCTIONAL CAPACITY IN OVERWEIGHT AND OBESE ELDERLY WOMEN

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Purpose: The purpose of this preliminary study was to determine the impact of mood states on functional capacity according to the BMI and depression score in physically active overweight and obese elderly women. Methods: We measured mood states (depression, fatigue, depression plus fatigue score and vigor) and functional capacity (grip strength, flexibility, lower limb muscle strength, up from the chair only once, balance, walking, speed, arm curl and extension in a min, 30-sec chair stand) on 687 physically active overweight [BMI] 27 to 30 kg/m²; N = 463) and obese (BMI > 30 kg/m²; N = 224) women aged 47 to 90 years. Other 176 physically active eutrophic women were considered as control volunteers. Results: Age, body mass and BMI have significant impact on mood states and functional capacity regardless of BMI and depression score. Lower or higher scores of depression, depression plus fatigue score, and mainly fatigue represented important predictors of functional capacity in overweight volunteers, but not for obese volunteers. The correlations ranged from -.19 (fatigue with grip strength for total overweight volunteers) to .46 (depression plus fatigue score with walking time for overweight volunteers with lower depression score). The influence of mood states seemed to be independent of other factors (age, body mass and BMI), except for grip strength (body mass in lower depression score) and speed (BMI in lower depression score. The vigor did not influence any functional capacity variable between overweight and obese volunteers. Conclusion: Our data showed that mood states score were not important predictors of functional capacity in physically active obese women. However, when analyzed only depression plus fatigue score and fatigue have a negative impact on grip strength, flexibility, walking time, speed and balance, suggesting that depression per se was a significant effect on eutrophic women. Keywords: Functional Capacity; Mood State; Overweight; Depression.
AGING IN PLACE THROUGH VOLUNTEER: AN EXAMPLE OF COMMUNITY CARING CONCERN IN TAIWAN

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Aging in place is very important policy that most Aged Societies face the problem of aging population to adopt. Taiwan tries to carry out aging in place policy by implementing the community caring concern centers and hopes to united community volunteers to offer the senior citizens the basic care and prevention. In this case, the senior volunteers are the important human resources of community caring concern centers in Taiwan. Meanwhile, the elder attend the volunteer services in order to allow themselves to integrate themselves into the community. This is the optimal path of aging in place. The purpose of research is to explore the meaning that the senior volunteers attend volunteer service of the community caring concern centres and the experience of aging in place. In-depth interview with on-site observation was conducted during February 2010 to April 2011 in Xigang Town, Tainan. We try to understand how volunteers at community caring concern centres help with the experience of aging in place. The results and discussion: 1. The motivations of senior volunteers attend the volunteer service of the communities include: helping other people, have fun, the social interaction, the sense of value, and help each other and learn the old people lives. 2. The effects of aging people attend the volunteer service for lives include: broaden interpersonal relationship, rise up the sense of happiness, self growth, and have the goal in life. 3. The concepts of the senior volunteers aging in place: live with the family, be familiar with environment, the convenience of life, the medical care and social activities. The senior citizens attend the volunteer service of community caring concern centres to get various positive experience and the values of their old lives. In conclusion, it is the optimal path for the elder to achieve the aging in place through the volunteer service in the local communities. Keywords: Aging in Place; Community Caring; Volunteer Service; Community.

RELATIONSHIP BETWEEN LEVEL OF PHYSICAL ACTIVITY AND LATENCY OF P300 AUDITORY IN PATIENTS WITH ALZHEIMER’S DISEASE

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Introduction: Latency of P300 auditory reflects information about time of processing information that is found impaired in patients with some types of dementia, including Alzheimer’s Disease (AD). Some studies investigated the relationship between processing information (P300) and physical activity in elderly and young healthy and concluded that the majority of active people showed faster processing information than less active ones. However, this investigation was never done in patients with AD. Objective: To analyze possible relationships between level of physical activity and latency of P300 auditory in patients with Alzheimer’s Disease. Methods: This study was performed in 17 AD patients in mild stage of the disease, mean age = 78,1 ± 6,8 years; mean schooling = 5,3 ± 4,5 years and mean 19,0 ± 4,4 points in the Mini-Mental State Examination. It was applied the Modified Baecke Questionnaire for Older Adults to assess the level of physical activity and every patients had the P300 latency evaluated. It was used a descriptive data analysis and the Pearson’s Correlation Test to check possible relationships. Results: The elderly with AD had a mean of 2.6 ± 1.4
points in QBMI, which shows low levels of physical activity in this population. The mean P300 latency was 410.6 ± 50ms. Pearson’s Correlation Test showed no significant correlation between variables (r = -0.2). **Conclusion:** Although this study did not show statistical correlation between physical activity and Latency of P300 auditory in patients with AD, it is early to extrapolate conclusions because of the limited available tools for assessing level of physical activity in elderly with dementia and the small number of patients evaluated to date. **Acknowledgements:** FAPESP, CNPq. **Keywords:** Alzheimer’s; Dementia; Physical Activity; Processing Information; Auditory.

**MOTOR LEARNING TRAINING IS THE EFFECTIVE TOOL AGAINST COGNITIVE DECLINE**

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**Background:** many medical reports confirming that people with mild cognitive decline having difficulties to perform the second concurrent cognitive activity during walking (dual task), which effects their independence. In our work we achieved effective action of cognitive-motor training that helps to increase the dual task capacity is equally effective against cognitive decline in elderly. **Methods:** we established special gymnastics, based on complex motor learning training. We preferred exercises with a cognitive effort in the first phase of motor learning during the initial stages of practice. 62 subjects were recruited (28men and 34women) aged 65-85 years who showed initial problems with concentration and memory and found that in addition to this difficulty in performing the dual task. It was proposed to them to perform an hour of activity twice a week for 4 months. **Results:** all participants showed improvement in all tests. The mean values obtained before and after surgery in the following tests: MMSE: 23.8 - 25.9; TMT-A: 78.9 - 60.8; GDS(30): 11.7 - 9.9; Digit Span Forward: 4.2 - 5.1; Rey Auditory Verbal Learning Test(first attempt ): 3.8 - 5.6; Rey Auditory Verbal Learning Test(15’): 8.1 - 9.9; Token test : 9.1 - 10.5; Tinetti tests: 26.0 - 27.5; Time “Get -Up and Go”10.96-9.56; Dual task 1:19.39-15.63; Dual task2:21.3-18.4. **Conclusion:** the practical method of complex motor learning training developed by us proved to be an important tool that helps increase the walking speed during dual task and improve cognitive function in people with mild cognitive decline. **Keywords:** Cognitive Activity; Walking; Motor Training; Auditory.

**ACTIVATION-TV IS LIVING WITH ELDERLY AND THEIR RELATIVES IN EVERYDAY LIFE**

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**Background:** The City of Vaasa, Polytechnic of Vaasa, and Polytechnic of Novia have started a two years technology project 1.4.2011 where they are developing electronic services by TV and computer to serve seniors who are living at their own homes or at service homes. **Project targets:** 1) to develop a virtual open source code serve system, which can support and activate seniors who are living at home or service homes and their relatives, 2) to develop employees and students knowhow to produce and utilise virtual service systems to everyday life, 3) to produce services with two languages (Finnish, Swedish), which can maintain senior capabil-
ity, social and physical activities, prevent social exclusion, decrease loneliness and feelings of security, and develop technical knowhow among elderly, and 4) to verify development, use and education of new innovations in social and health sector. Implementation: Polytechnics teachers and student as well as employees of Ageing Centre are putting in to practise all programs in Activation-TV. Project is coming up 1.4.11-30.3.2013 and its content areas are following: health, physical exercises, culture and hobbies, as well as advices. Seniors can participate themselves for example in groups where they discuss interesting topics, or watch on video records, or talk with relatives and friends in face-book -application. Pilot groups: The project leader choose five senior from homes (n = 5) and from service homes (n = 5) and three service homes (n = 24) to this project as pilot groups to whom this project offer all technical tools. In poster presentation we will show first tests results of pilot groups’ expectations, technical skills, and social interactions, state of minds, loneliness and insecurity as well as physical movements. These first tests are carrying out in January-Mars 2012. In poster presentation will also be examples of video-programs which students have designed. Keywords: Service Homes; Virtual Service Systems; Physical Exercises.

**FUNCTIONAL FITNESS AND IMMUNE SYSTEM IN OLDER WOMEN**

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**Introduction:** Physical activity (PA) on a regular basis can help to prevent diseases and improve functional fitness (FF) in the elderly. Additionally, PA has been associated with improvements on immunological system function. However the benefits of PA and FF on immunology system remain unclear. **Objective:** To analyze the influence of functional fitness level on the number of leukocytes, lymphocytes and neutrophils in older women. **Methods:** Thirty women aged 60 years and over were assigned in two different groups: 1) High Fitness Group (HFG; 67.07 ± 7.59 years, 67.63 ± 13.69 Kg; 1.59 ± 0.05 m and 429.9 ± 19.2 points in a global FF index); and 2) Regular Fitness Group (RFG; 68.80 ± 7.88 years, 69.33 ± 16.32 Kg; 1.55 ± 0.07 m and 213.2 ± 56.9 points in the above mentioned index). The FF level was assessed by taking into account the scores obtained by performing the American Alliance for Health, Physical Education, Recreation and Dance’s battery of motor tests, that was specifically designed for older people. The blood cells counting were assessed by applying the fasting blood test, which was performed in a specialized laboratory of analysis. **Results:** Significant differences were observed between groups for FF level for both, global and specific items measured by the battery of tests. (p < 0.01). Regarding leukocytes (HFG 5766 ± 1004 vs RFG 5986 ± 1341 mil/mm3), lymphocytes (HFG 1972.8 ± 361 vs RFG 1769.9 ± 587 mil/mm3) and neutrophils (HFG 3313 ± 733.9 vs RFG 3704.8 ± 920.6 mil/mm3), no statistical difference were observed (p > 0.05). **Conclusion:** Functional fitness level alone does not seem to affect the number of leukocytes, lymphocytes and neutrophils in older women. Future studies should also involve participants with lower level of functional fitness and include other lifestyle-related factors, which may also influence the immune system, in addition to a larger sample. **Acknowledgements:** State Funding Agency FAPESP (n. 2011/07374-8). **Keywords:** Functional Fitness; Immune System; Physical Activity; Lifestyle.
ATTITUDES TO AGEING, PERCEIVED CONTROL AND PHYSICAL ACTIVITY TO IMPROVE COGNITIVE FUNCTIONING

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Evidence suggests that physical activity interventions can improve cognitive functioning in older adults and potentially delay the onset of dementia. However, inconsistent findings across studies suggest there may be other factors that influence the relationship between physical activity and cognitive improvements or lack thereof. In non-exercise related observational and intervention studies, attitudes to ageing, self-perceptions of ageing and perceived control have been associated with better cognitive functioning, functional health and longevity. This pilot study investigated whether these psychological variables mediated the effectiveness of an exercise intervention which aimed to improve cognitive functioning. Middle-aged sedentary participants were randomly assigned to either strength training or control (yoga or sedentary) programmes. The strength training programme involved carrying out specific exercises at home using resistance bands three times per week for 12 weeks. Attitudes to ageing were assessed using the Attitudes to Ageing Questionnaire (AAQ) and perceived control using the Adult Dispositional Trait Hope Scale. Cognitive functioning outcome measures included the Hopkins Verbal Learning Test-Revised (HVLT-R) and verbal fluency. Results and conclusions are presented here. Keywords: Perceived Control; Physical Activity; Cognitive Functioning; Dementia.

EXPLORING LIFELONG LEARNERS ACTIVELY MAKING ART

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Because our society’s view of aging have changed as a result of new ideas and investigations confirmed in the medical field, theorists in the social sciences and humanities are exploring a deeper understanding of the link between art making and creativity within the human experience as evidenced in lifelong learning. Results of studies confirm that creating art encourages the growth of new brain cells, stimulates bilateral brain involvement, and offers engagement in new and challenging experiences. With the tidal wave of our Baby-Boomers generation reaching retirement, our culture is focusing on “aging successfully” by maximizing the psychological growth for an individual’s entire life. The purpose of this research is to investigate by qualitative interviews, observation and quantitative survey, an examination of the function of painting and drawing in a studio setting, and examine how different facets of perception, or ways of seeing change as a result of that participation, in addition to exploring the health and well-being effects of engaging lifelong learners in the activity of making art. Results are anticipated to find positively engaged lifelong learners creating art within a studio setting, while having a direct impact on emotional vision by revealing a clear vision of ourselves and others, thereby influencing the health and well-being of actively aging adults and the community as a whole. Keywords: Art; Creativity; Wellbeing; Health.

QUALITY OF LIFE AND NUTRITIONAL STATUS OF ELDERLY IN PROGRAMS FOR SENIORS

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**Objectives:** Evaluate the quality of life of the elderly in programs for seniors from three universities located in the cities of Sao Paulo, Sao Caetano do Sul and Mogi das Cruzes, and analyze the influence of possible intervening factors. **Methods:** It was a field, cross-sectional and quantitative-descriptive study, in which 182 elderly of both genders (≥ 60 years) participated. The nutritional status evaluation was done by means of anthropometry, with the measurement of weight, height and waist circumference (WC). To classify the nutritional status, it was used the body mass index (BMI). To evaluate the subjective perception of quality of life, it was used the World Health Organization Quality of Life Questionnaire (WHOQOL-BREF). To assess the level of physical activity, it was used the International Physical Activity Questionnaire (IPAQ), short version. Multiple linear regression analysis was performed among the dependent and the independent variables. In all analysis, it was adopted a significance level of 5%. **Results:** The mean score of the WHOQOL - BREF ranged from, approximately, 57.0 and 77.0 in the questions and domains assessed. The results of multiple linear regression showed that the absence of diseases positively influenced the quality of life in all domains evaluated. In the environmental domain, higher education degree, old age, absence of diseases and residence in Sao Caetano do Sul positively influenced the quality of life of the elderly, in this order of importance. **Conclusion:** The mean score of the WHOQOL - BREF suggests a perception, about the quality of life, reasonable to good, considering that the closer to 100, the better is the quality of life. The factors associated with better quality of life were: higher education degree, old age, absence of diseases and residence in Sao Caetano do Sul, in this order of importance. **Keywords:** Quality of Life; Nutritional Status; Physical Activity; Elderly.

**IMPACT OF ADVOCACY, INNOVATIVE SERVICE DELIVERY ON ELDERLY RIGHTS, WELFARE AND SUSTAINABLE LIVELIHOODS IN CAMEROON**

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The paper addresses elderly problems on rights, advocacy, Legislation and livelihoods, needing innovative services. It analyzes systems and care for elderly, now eroded due to HIV/Aids effects on young people. Elderly care work indicators; from 2009 through 2010 to 2011, 131 elderly clubs formed, 3,644 families on elder care, 127 volunteers carrying out home-visits, 18 schools helping elderly, 61 elderly committees formed to support work at the grassroots, 34,336 elderly educated on HIV/Aids, 70,149 elderly empowered on their rights, 2,120 elderly issued Identification papers, 1900 elderly registered for elections, elderly rights covered by the media, 85% elderly clubs doing gardening, elderly income increased, elderly trained on agriculture, 632 elderly produced wash powder, elderly health improved project work impact on beneficiaries, 7,627 elderly benefited directly, 70,149 elderly involved in advocacy and 10,514 elderly people benefited indirectly. Work long term benefits: Improved attitudes towards elderly, information flow on elderly rights, elderly continues influence on national policy, government enacting elderly rights’ laws, society supporting elderly, elderly project results replicated, increase in elderly clubs, poverty and hunger reduced among elderly, innovative aspects of project work used elderly-driven, rights-based approaches to improve work on elderly rights, elderly and local volunteers collaborating with stakeholders, elderly managing clubs, Accountability and transparency information made available to stakeholders, elderly part of decision-making and -generational links for children and elderly encouraged. Project work Achievements were recorded in advocacy, legislation, rights, welfare, social inclusions and livelihoods. Conclusion: Project work with the elderly
has innovative ideas, with good scope for replication elsewhere. **Keywords:** Welfare; Elderly Rights; Innovative Service; Advocacy.

**LIFE SATISFACTION AND SELF-REPORTED DISEASES IN MIDDLE-AGED/ OLDER SUBJECTS ENROLLED AT AN OPEN UNIVERSITY OF THE THIRD AGE**

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**Background:** Life satisfaction is the cognitive evaluation of one’s life as a whole. In general, it is strongly affected by poor mental health, mainly depression and anxiety, and chronic illnesses, particularly those that cause disability. This study investigates the relationship between life satisfaction and self-reported diseases in middle-aged/older subjects enrolled at an Open University of the Third Age (UnATI). **Methods:** 299 middle-aged/older subjects (65.2 ±6.1 years old) of both sexes (71.6% women and 28.6% men), enrolled at the UnATI run in the School of Arts, Sciences and Humanities of the University of São Paulo, were invited to answer a series of questionnaires as follows: sociodemographic and health form, Overall Quality of Life Scale, Satisfaction with Life Domains Scale (SLDS), Mini-mental State Examination and Geriatric Depression Scale. After that, participants were divided in three groups according to the number of self-reported diseases: free of diseases (G1), with one or two diseases (G2) and with three or more diseases (G3). The groups were compared using Kruskal Wallis test. In case of significance, Mann-Whitney test was used to determine the inter-groups differences. Spearman’s correlation test was used to assess the association between variables. The level of significance was set at p ≤ 0.05. **Results:** G1 and G2 had higher life satisfaction than G3 (health and physical status). G3 showed more depression symptoms and higher medication consumption than the other groups. Age was positively associated with the number of diseases and life satisfaction. The number of self-reported diseases was inversely correlated with life satisfaction (overall, health and physical status). **Conclusion:** Middle-aged/older subjects with three or more self-reported diseases have lower degree of life satisfaction and more depression symptoms. In addition, the number of self-reported diseases correlates positively with age and negatively with life satisfaction. **Keywords:** Mental Health; Depression; Life Satisfaction; Quality of Life.

**ACTIVE AGING IN MACAU: A CASE STUDY OF A 78 YEAR OLD WOMAN**

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**Background:** Macau is a Special Administrative Region of China and a small city that is well equipped to facilitate active ageing among the elderly people because of its highly developed economies and abundant volunteering civic organizations. Although the Macau population is aging, how the older people live actively has not been studied. **Objective:** This paper explores how elderly people can live actively in Macau. The results of the study will contribute to the development of a model of active aging to enhance health, and identification of factors affecting active participation in social and physical activities among elderly people. **Method:** The data source is a semi-structured interview with a 78 year old woman, who was purposely selected because of her low socioeconomic status yet highly active living, strong and much younger than age physical appearance, and excellent self-rated health. **Findings:** The respondent regularly and frequently participated in different kinds of social activities, including learning, leisure, volunteering and political ones. Consequently, she
acquired meaning of life and some social capital. She also participated in different kinds of physical activities including martial arts and Chinese folk dancing everyday for about an hour a day. To take part in the varieties of social and physical activities, she walked for at least half an hour a day. Although she has two cardiovascular conditions, her self-perceived health was excellent and much improved than a few years ago. Conclusion: The Macau elderly people can live an active life by participating regularly and frequently in varieties of social and physical activities which help to maintain good health. The critical factors are a good social welfare system, availability of different volunteer groups and culturally tuned physical activities. Keywords: Active Aging; Physical Activity; Social Activity; Welfare.

PRACTICES OF ACTIVE AGEING

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This paper explores different ways of practicing active ageing, through examples from ethnographic fieldwork at two activity centres in Denmark. The social aspect of active ageing is usually mentioned in policy programs (e.g. WHO:2002, EU:2011), but in practice physical activity is the main focus. The elderly should lead physically active lives to prevent diseases and increase quality of life. However, during interviews with active elderly, the author often meets ambiguous stances towards active ageing. Many active elderly identify with active ageing, but others perceive active ageing as a pressure they occasionally wish to escape from. Carsten, 70 years old, goes to the local activity centre every morning to do his exercises. His schedule is always full with activities such as ping-pong, cycling or sailing. Carsten is in many ways an ideal active elderly, but feels socially isolated despite his active life. Outside of activity spheres he only talks to his wife and children. Some informants use activities to get social relations. For others the activity centre is not a social arena. These informants often see the activities as a demand and feel an urge to resist active ageing. There seems to be a tension between: 1. Physical activity as increasing quality of life and wellbeing, and 2. Physical activity as a constant and constraining demand that becomes almost impossible to meet, thereby excluding and alienating elderly who either cannot identify with the focus on physical activity or focuses solely on physical activity while being socially isolated. The paper concludes that the social aspect of active ageing is often overseen in practice, and that this risks leading to a decrease in wellbeing for the active elderly. In addition the paper asks whether policies and new health technologies can facilitate the social aspects of active ageing. Furthermore it is explored how the communities at the activity centres can increase social active ageing. Keywords: Active Ageing; Physical Activity; Quality of Life; Wellbeing.

FLOURISHING IN LATER LIFE: LEARNING FROM POSITIVE PSYCHOLOGY

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Over the last ten years the discipline of academic psychology has directed attention toward understanding positive human experiences – how and why people feel good and function well. The importance of ‘positive psychology’ for individuals, families, organisations and the wider community is being recognised by academics, health and social care practitioners, policy makers and politicians. The knowledge we are gaining about subjects like human strengths and virtues, the power of positive emotion, and the experience of flow (also known as optimal human experience) is highly pertinent to the lives of older people, including
those with physical and mental health issues, and individuals living with dementia. This presentation explores some of the implications of what we have already learned for how we can all continue to flourish as we age, and points towards future directions which deserve exploration in this exciting unfolding field. **Keywords:** Psychology; Dementia; Physical Health; Mental Health.

**AGING AND PHYSICAL ACTIVITY EFFECTS ON RESPONSE SLOWING**

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**Introduction:** Behavioral slowing is a significant index of aging. Is the slowing caused by the slow speed in information processing, the central and peripheral neural transmission? Or is it caused by the factor of physical activity? These two doubts need to be questioned. This study was designed to examine age and physical activity (PA) effects on the reaction time (RT) and movement time (MT). Specifically, is there interaction existed between age and physical activity in RT and MT? **Methods:** Participants were 72 older adults volunteers, who were aged 65-74 (young older adults), and 75-84 (older adults). Physical Activity Survey for Elderly (PASE), EMG (BIOPAC System MP150, 1000Hz), and Simple RT (SRT) device were administered to measure MT and RT (Premotor RT and motor RT). A 2 (age) X 3 (high/medium/low PA) two-way ANOVA was used to analyze MT, RT, Premotor RT, and motor RT. **Results:** (1) MT: Significant difference was found for age main effect. (2) SRT: No significant differences in main effects of age and PA were found. (3) Premotor RT: No significant differences in main effects of age and PA were found. (4) Motor RT: Significant difference for PA main effect was found, in that premotor RT of low PA group was significantly longer than that medium and high PA groups. **Conclusion:** Evidence of age and PA effects on nerve conduction velocity suggests process-specific slowing in RT. **Keywords:** Ageing; Physical Activity; Reaction Time; Movement Time.

**DEVELOPMENT OF THAI YOGA–CHI KUNG NEUROMOTOR COMBINATION EXERCISE FOR ACTIVE AGING**

_Buranruk, Orawan_

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The American College of Sports Medicine (ACSM) and Complementary and Alternative Medicines (CAM) recommended some form of neuromotor exercise (sometimes called functional fitness training), to increase (or maintain) balance, agility, and coordination such as Tai chi (tai ji), Chi Kung (qigong), and yoga, along with lesser known disciplines such as Rusridadtone (Thai Yoga). Currently, the related studies in Thai elderly people found that required longer learn training in Tai Chi than Chi Kung as a form of movement meditation domain. Most of them also were greater familiar Thai Yoga than Yoga in form of combination between stillness and movement meditation. Therefore, the purpose of this study was to provide multifaceted physical activities involve varying combinations of neuromotor exercise in form of Thai Yoga–Chi Kung combination. The study included a pre-test questionnaire, training programme, and post-test questionnaire. Analysis of the questionnaires revealed that most participants considered Thai Yoga–Chi Kung combination the beneficial therapeutic effects to be the neuromotor skills training. It provided a structured, goal-oriented process
that challenges the patient to synchronize a range of mind and body exercises to a precise holistic intervention and to decrease long term learning. Thai Yoga-Chi Kung combination therefore was the correct quantity and quality for developing active aging and maintaining fitness in Thai adults. Keywords: Active Aging; Tai Chi; Yoga; Physical Activity; Neuromotor.

OVERCOMING FEAR OF WATER WITH EXCEL 2000

Bevan Jones, Penny

Excel 2000, UK.

Frightened of water as a youngster some older people now want to be “active in the water” with their family, yet, they are too fearful to progress. Excel 2000 has developed a gentle programme of water based activities to address this issue filling this gap in services in an adapted confidence boosting “one to one” programme with the timorous person gaining self assurance. Using a health questionnaire the instructor establishes the physical, mental and neurological condition and targets of the client. Once confidence is assured they walk into the pool together to join the modified aqua class. The instructor introduces the client to a mentor member who overcame their fear and who is now happy and confident with the life enhancing programme. The music plays, activities start using buoyancy aids. I designed and have instructed these sessions for 19 years at my local pool – Splash – part of DC Leisure Company. Excel 2000 also delivers workshops and courses for the training of instructors. An 80 year old lady with COPD went from being terrified of water to walking in water up to her neck, then managed a few strokes without anxiety and is looking forward to swimming with her grand children. A 55 year old man sat fully clothed for months watching the sessions, too fearful to join in. The instructor spent some time gaining his trust. He overcame his fear and went swimming on honeymoon with his bride. A third of my group members were non swimmers when they first attended. The activities in the water have enhanced mobility, been a springboard to more active pursuits and sports for some, a preparation for surgery and recovery after for some, a weekly way of life for others. Social integration has offset loneliness and isolation, new friendships and activities have been welcomed. Excel’s system of “one to one” aquarobics is innovative and really helps by giving people with physical, mental and emotional challenges the chance to overcome their fear of water. Keywords: Training of Instructors; Fear of Water; Excel 2000.

THE CHOSEN BRITISH SENIORS’ ATTITUDES TOWARDS THEIR ACTIVE AGEING

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Introduction: As many authorities state human ageing concerns the moral (John Paul II 1999), as well as demographic (Lehr 2006), economic (Getzen 2000), and those issues, which are connected strictly with seniors’ physical efforts aimed at their health promotion (Chodzko-Zajko and others 2005, Kalache 2004). Method: The group of highly educated British seniors at the age of 50 and more from both the University College Birmingham, the Aston University, the Woodbroke Quaker Study Centre in Birmingham, and the University of the Third Age in Nottingham were included into the research in 2007 and 2009 as the part of the bigger investigative enterprise embracing some other European third age universities’ students. However, the accent in this presentation has been only put on the data, found solely in the British older respondents, such as the attitudes towards health-related movement, based
on the importance of the value of fitness. While examining the seniors the Scheler value scale constructed by Piotr Brzozowski, and the author’s questionnaire of attitudes and behaviour inventory have been used. The statistics for the physical culture values’ measured frequency distribution have also been counted. **Results:** The British seniors appreciate physical fitness and attribute to this value the score of 70 points (from the scale points’ bracket between 0 and 100) most often, while half of them value fitness at minimally 68 points, although the men treat it slightly higher than the women. Both the British women and men present the positive attitudes towards their participation in health-aimed physical activity. Nevertheless, one can notice in the attitudes showed the higher rank of the cognitive and emotional factors in opposite to the behavioral one. **Conclusion:** Those findings above should incline to seek for answering the question about the more effective way of real supporting the silver generation in active relaxation. **Keywords:** Active Ageing; Demographic; Economic; Health; Fitness.

**EFFECT OF FOCUS OF ATTENTION ON MOTOR LEARNING IN OLD AGE**

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**Introduction:** Focus of attention has been presented as a factor which can promote qualitative superior performance and speed up learning while individuals could adopt automatic patterns of control. In the other hand, there are some evidences that, during the learning process, elderly tend to direct attention toward to their body movements in an online movement control mode, which it has been associated with not efficient muscle system activation, and an inhibition of an effective automatic process of control. **Objective:** Thus, the objective of this study was to examine whether the adoption of a focus of attention, internal (IF) and external (EF), could affect the learning process of a motor skill in old age. **Method:** Two groups with 20 individuals between 60 and 75 years old performed darts throwing toward a static target. **Results:** Results showed that although the two groups have improved performance with practice and were able to learn, EF group showed discrete advantage during initials stages of learning. Despite of that, there were also some indicatives that when instructions were repeated during the acquisition, it could have taken EF group off from the automatic control, causing performance decrease. **Conclusion:** Considering that the performance differences found at the beginning of learning did not maintain, particularly, in the retention test, it is not possible to accept the hypothesis that the external focus is favorable in darts throwing learning in old age. **Keywords:** Focus of Attention; Motor Learning; Control.

**USING A LIFESTYLE EXERCISE PROGRAM TO IMPROVE FUNCTIONING IN OLDER PEOPLE RECEIVING A RESTORATIVE CARE SERVICE: A PILOT STUDY**

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**Background:** Silver Chain has delivered the Home Independence Program (HIP) and the Personal Enablement Program (PEP) since 2002 and 2003 respectively. Both are restorative home care services and aim to maximise functioning and reduce the need for ongoing services for older people. These programs have been evaluated extensively and have been shown to be effective overall; however the seven individual components that make up HIP
and PEP have not been evaluated independently. My research is interested specifically in the physical activity component of Silver Chain’s restorative care programs and maximising its effectiveness in improving client functioning. My previous research has shown traditional exercise programs have not been continued long term by this population and clients stated a preference for participating in exercise that is incorporated into their daily routines and tasks. It was therefore determined that a lifestyle exercise program should be trialled as an alternative. The first step being a pilot study. **Aim:** To test the viability of the Lifestyle and Functional Exercise program (LiFE) as the means to incorporate exercise into the daily living activities of older people receiving a restorative home care service from Silver Chain, and to determine whether it is a viable alternative to the current exercise program used.

**Methods:** The LiFE program was trialled by Silver Chain’s Independence Care Managers with eight older people receiving HIP or PEP. Data were collected at baseline and 8-weeks (post intervention) to determine whether the program improved client function and if it was appropriate for older home care clients receiving a restorative care service. **Findings:** Data were collected between February and May 2011 and early analyses show significant improvements in a number of measures. **Conclusion:** The LiFE program is viable for this population and can now be trialled in a randomised controlled trial. **Keywords:** Lifestyle; Restorative Care; Physical Activity; Functional Exercise.

**WHAT MATTERS? EFFECTS OF DIFFERENT PHYSICAL TRAINING PROGRAMS ON COGNITIVE FUNCTION IN ELDERLY MEN**

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There is hopeful evidence that physical activity could be an effective approach to improve the cognitive performance of elderly people (Barnes et al., 2007; Colcombe & Kramer, 2003; Erikson & Kramer, 2009; Etnier et al., 2006). Most of the intervention programs are endurance-based. Only little is known about the benefits of strength training on cognitive functions (Lui-Ambrose & Donaldson, 2009). The objective of the present study is to examine the evidence of three different training programs on cognitive abilities. 35 physically active men (mean age = 72 years) underwent physical (mobility, balance), cognitive (information processing speed, memory, executive function), and fitness tests (maximum strength of the upper and lower limbs, VO₂max). The sample was randomized divided into 3 interventions groups: walking (60-65% HRmax, n = 10), moderate (60-65% 1RM, n = 13) and high intensive strength training (80-85% 1RM, n = 12). The groups do not differ in age, cognitive and physical performance at baseline. The participants in all training groups show improvements in physical function, aerobic fitness and strength after 3 months of the biweekly training program. However, the cognitive performance increases slightly in all groups and group by time analysis reveal only marginal different changes in cognitive performance relative to the intervention program. In general, the results show increased cognitive performance independently from mode and intensity of the training program. Even so, although not significant, these results might support the assumption that endurance and strength training have different benefits and provoke different mechanisms which are responsible for improvements of cognitive functions. Further research with larger sample sizes and longer intervention could verify this supposition. **Keywords:** Physical Training; Cognitive Function; Aerobic Fitness.
3RD-LIFE: VIRTUAL PLATFORM SUPPORTING ACTIVE AGEING AND INCREASING ELDERLY INCLUSION

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The main objective proposed by WHO (2002) during the Second United Nations World Assembly was to promote the healthy aging optimizing opportunities for health, participation and security throughout the life course. According to Cornwell & Waite, (2009) social isolation and infrequent participation in social activities pose health risks and reduce quality of life of elders. Therefore, improving social network and preventing social isolation are important factors where Information and Communication Technology (ICT) play an important role, also for older people Zinnikus, (2009). In an attempt to address the needs, 3rD-LIFE project promote the development of a 3D virtual tool which consist of a social platform, where aging people can increase their social interaction and active ageing. Interviews and focus groups were carried out at INGEMA (Spain) and at CURE (Austria) with 54 participants. The users, showing a normal cognitive aging, had previous technological experience and were asked about: communication habits with friends and family, social relationships, usage of Internet, social network sites and attitude toward technologies. In both countries the participants reported having close relationships with friends and children. In Spain, traditional channels of communicating are still most frequent used, e-mail is used to some extent. In Austria, older people use the Internet in their daily life for financial issues, social networking and gaming. Regarding attitude towards internet the Spanish sample had less positive attitude than the Austrian. The participants perceived cultural, educational or entertainment activities as attractive 3rD-LIFE tools. They expressed the wish to meet new people with similar hobbies in 3rD-LIFE, and have a place for sharing information and some applications like e-learning and serious games. 3rD-LIFE will promote the opportunities for active aging and could increase the quality of life of elderly through its wide range of possibilities. Keywords: Active Ageing, Inclusion; Quality of Life; Social Network; Technology.

CREATING HOME LIKE PLACES IN A PURPOSE-BUILT RETIREMENT VILLAGE IN THE UK

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Providing sustainable environments that are capable of supporting individuals in realizing their potential, and will allow them to participate actively and contribute to their communities throughout their lives, is an urgent policy matter and one that is key to enhancing quality of life as we age. One response to this is the move away from traditional housing for older people, generally provided within a framework that fosters dependency, toward more flexible and inclusive approaches designed to provide choice and promote autonomy. Purpose-built retirement communities are one example of such innovation, and are contributing to the rapid transformation of housing options in later life. Fundamental to these developments are notions of ‘ageing in place’ and ‘homes for life’. In this paper, we ask whether such purpose-built retirement communities can be places that residents would call ‘home’ and, if so, whether they do indeed offer ‘homes for life’. We begin by examining key theories that inform understandings of ‘home’ and the significance of the concept in relation to
well-being. We then turn to findings from the four-year Longitudinal study of Ageing in a Retirement Community (LARC) and explore the vision behind the development of one particular village, the extent to which that vision has translated into an environment allowing residents to successfully engage in the process of ‘home’-making, and the consequences for their ability to age well in place. We conclude with a discussion of the broader implications of the findings for policy and service provision. In particular, we ask how those involved in developing and providing this particular form of accommodation for older people might continue to identify and meet the needs of growing and increasingly diverse populations. We suggest that crucial to this is an understanding of the complexity and importance of ‘home’ as we age. **Keywords:** Quality of Life; Housing; Retirement; Wellbeing.

**WORK ABILITY IN MIDLIFE AND SELF-RATED HEALTH: A 28-YEAR LONGITUDINAL STUDY**

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**Background:** The main objective of this study was to examine longitudinally the associations between the work ability of middle-aged occupationally active employees and their self-rated health (SRH) over the retirement years. **Methods:** The study sample constitutes a follow-up questionnaire of Finnish municipal workers (n = 6257) conducted at the Finnish Institute of Occupational Health from 1981 to 2009. The respondents were born between 1923 and 1937. Over the follow-up, 2220 persons deceased. In 2009, a total of 3092 persons had responded to all five (1981, 1985, 1992, 1997, 2009) cross-sectional questionnaires (the response rate was 75%). The measure of SRH was constructed from the following item: “Compared to your friends of the same age, is your health much better, slightly better, the same, slightly worse, or much worse?” It was further classified as better, the same, and worse. General linear models with repeated measures was used to assess the effects of the four levels of work ability index (excellent, good, moderate, poor) and co-variates (physical functioning, activity, chronic diseases, health behaviours, gender, age, marital status, and socio-economic status) on health. **Results:** The results showed that work ability index was a strong predictor of later-life SRH. If a person had an excellent work ability the odds of reporting good health was 4-fold (among men OR = 4.4, 95% CI 3.4 - 5.8, among women OR = 3.80, 95% CI 3 - 4.8) compared to the odds of a person with poor work ability having good health during the retirement years. Even an increase from poor work ability to moderate doubled the odds of good health. **Conclusions:** The strong connection between work ability and SRH suggests that promotion of work ability during occupationally active years may have positive impacts on health and well-being far beyond retirement transition. **Keywords:** Physical Activity; Wellbeing; Retirement.

**SYSTEMATIC REVIEW OF SUCCESSFUL AGEING DEFINITIONS**

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In the 50 years since the introduction of the term “successful aging (SA)”, a consensual definition has not been reached. Clinical and theoretical researchers have conceptualized and operationalized SA differently, resulting in a myriad of interpretations. A systematic review was undertaken to identify operational definitions of SA. Seventy-two studies, and 82 definitions, were included; 95% of studies include health-related components (i.e. physical
function/disability), 47% include engagement components (i.e. active social/life engagement), 43% include well-being components (e.g. life satisfaction), 25% include personal resources (i.e. attitude), and 5% include extrinsic factors (i.e. environment/finances). Categorical operational definitions identify between < 1% and > 90% of study participants as successfully ageing. The heterogeneity of these results supports the multidimensionality of SA and the difficulty in dichotomizing usual vs. successful aging. Although the majority of operationalizations reveal a biomedical focus, studies are increasingly using psychosocial and lay components to inform operationalizations of SA, indicating a trend towards a more holistic perspective of SA. Prospective models of SA should, therefore, be multidimensional, continuum-based, including objective and subjective items. The adoption of a unifying definition of SA will permit comparison across cultures and contexts; however, the absence of consensus is an inhibitive force in the advancement of the field. Keywords: Successful Aging; Definition; Systematic Review.

EXPLORING THE EXPERIENCES OF OLDER CYCLISTS IN ORDER TO PROMOTE SAFETY

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Cycling is generally recognised as a healthy activity, with health benefits identified at the individual as well as the societal level. For older people, cycling as a form of aerobic exercise has been associated with improved cardio respiratory fitness and cognitive capacity. However, cyclists are vulnerable road users in modern traffic systems, and elderly cyclists are at relatively high risk of casualties per kilometre travelled compared with other age groups. Despite this, relatively little research has focussed specifically on older cyclists or on their experiences. Drawing on data from the Safer Cycling Study [1], a cohort study of over 2000 adult cyclists conducted in New South Wales (Australia), this paper describes and compares the characteristics and behaviour of older cyclists with cyclists in other age groups. The paper explores: cycling frequency; cycling purpose; distance, duration and speed of cycling; infrastructure utilisation; type of bicycle and safety equipment used; crashes and self-reported factors contributing to these crashes; and injury severity. A better understanding of older cyclist behaviour and risk is essential given the demographic ageing of the population, and to inform policy and planning in countries such as Australia, where government is aiming to increase levels of cycling across the community. References: [1]Poulos RG, Hatfield J, Rissel C, Grzebieta R, McIntosh AS. Exposure-based cycling crash, near miss and injury rates: The Safer Cycling Prospective Cohort Study protocol. Injury Prevention 2012;18:e1. doi:10.1136/injuryprev-2011-040160. Keywords: Cycling; Respiratory; Aerobic; Cognition; Demographic Ageing.

DEVELOPMENT AND PSYCHOMETRIC PROPERTIES OF THE GRONINGEN AGEING RESILIENCE INVENTORY

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Introduction: A predominant stressor in older age is frailty. Frailty is a dynamic process of progressive decline in physical, psychological and social functioning in. Adaptive processes, in which people compensate for negative consequences of aging like frailty, seem to be important for successful aging. Resilience is a construct related to the adaptive capacities
of individuals to bounce back or cope successfully despite substantial adversity. There are different scales that measure resilience in different populations, however none of these resilience scales are specifically constructed and validated for (pre)frail older adults. AIMS: The objective of the present study was to develop and validate the Groningen Ageing Resilience Inventory (GARI). Methods: The GARI was developed, and 134 community-dwelling older adults aged >70 years were invited to complete the 17-item self-report questionnaire. A psychometric study was performed to examine the internal structure, the validity (construct and convergent) and reliability (test-retest and homogeneity) of the GARI. The Groningen Frailty Indicator was used to map the sample in the study. Results: Factor analysis using the principal component method generated three coherent factors of resilience in the present sample; ‘adaptive capacity’, ‘connectedness’ and ‘self-confidence’, explaining 43% of the variance. Cronbach’s was 0.77. Convergent validity yielded positive and significant correlations between the GARI, the Dutch General Self-efficacy Scale, and the Sense of Coherence scale. Analysis of test-retest reliability generated ICC values of 0.63-0.72 for the three subscales. Conclusion: The GARI is an applicable inventory for measuring resilience in (pre)frail older adults. It can be used as a screening instrument to get additional information to the standard geriatric assessments, to assess and track changes in resilience during frailty transitions. Keywords: Resilience; Frailty, Groningen Ageing.

BLOOD PRESSURE VARIABILITY IS ASSOCIATED WITH COGNITIVE IMPAIRMENT IN COMMUNITY DWELLING OLDER PERSONS AND IS A PREDICTOR OF COGNITIVE DECLINE

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Background: Elevated ambulatory blood pressure (BP) predicts end-organ cerebrovascular, cardiac, neurodegenerative and renal damage. The relationship between ambulatory BP variability and age related cognitive function is unknown. Objective: To assess the potential association between BP variability and cognitive function in an unselected sample of community-dwelling older persons, and to explore the impact of these parameters upon cognitive decline. Methods: Participants were randomly sampled from a single general practice. Twenty four BP monitoring was carried out at baseline. Cognitive assessments took place at baseline and after 5 years follow-up using the Mini-Mental State Examination (MMSE) and the Cambridge Cognition Examination (CAMCOG). Participants were 65 or older at baseline. Three hundred and one individuals participated in baseline assessment 207 participated in the follow up examination. Results: At baseline increased SBP variability was independently associated with lower CAMCOG total score (P < 0.001), CAMCOG memory sub-score (p = 0.001) and CAMCOG executive sub-score (P < 0.001). Greater daytime diastolic BP variability was independently associated with poorer CAMCOG executive sub-score (P = 0.026). Increased baseline daytime systolic variability was independently associated with poorer scores in all domains of the CAMCOG at 5 years. Increased baseline daytime SBP variability was independently associated with greater decline in MMSE (P = 0.025) and CAMCOG memory scores (P = 0.010). Increased baseline daytime diastolic BP variability was independently associated with greater decline in MMSE and CAMCOG total (P = 0.007 and P = 0.016 respectively). Conclusion: Increased blood pressure variability is associated with impaired cognitive function and cognitive decline in community dwelling older people older persons. Keywords: Blood Pressure; Cognitive Function; Elderly.
CORRELATES OF EXERCISE MAINTENANCE AMONG ORIENTAL OLDER PEOPLE
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Background: Despite well documented health benefits of exercising, only one third of older adults participated in regular exercise globally. Understanding correlates of exercise maintenance among oriental older people may contribute to decision making about tailored physical activity intervention that could enhance maintenance of physical activity among this population. Objective: To investigate correlates of exercise maintenance among oriental older people living in rural area. Methods: A retrospective study design was used to survey a group of older people living in a rural community. Data were collected through face-to-face interviewing with the use of a structured questionnaire. Hypothesis was tested through statistical analysis of logistic regression with the use of SPSS 14.0 software. Results: A total of 108 participants was recruited. There were 76% of participants self-reporting to involve in regular physical activity and 69% of participants meet our requirement of being in a maintenance stage. Three factors were included in a logistic model to explain maintenance of mild physical activity and explained 53% variance of the dependent variable. Exercise self-efficacy was an only predictor of older people’s moderate physical activity and explains a total variance of 24%. Conclusions: Design of physical activity intervention aiming at enhancing maintenance of physical activity among older people needs to take factors of exercise self-efficacy, exercise outcome expectation and number of chronic disease into consideration. Improving exercise self-efficacy may be particularly crucial in increasing maintenance of moderate physical activity in older people. Keywords: Physical Activity; Rural; Exercise; Elderly.

LIVING WITH SUBJECTIVE MEMORY COMPLAINTS: IMPACT ON ACTIVITY AND PARTICIPATION
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Background: Subjective memory complaints (SMC) affecting daily life are reported by older adults in the absence of objective cognitive impairment (Elfgren 2010). SMC may reduce quality of life and increase anxiety (Mol et al 2009) however little is known about the impact of SMC on occupational performance. This study aimed to elicit the lived experience of SMC among community-dwelling older adults. Method: Five community-dwelling older adults (>65 years) attending a community-based rehabilitation unit completed semi-structured interviews which were transcribed and analysed using interpretive phenomenological analysis (Smith et al., 2009). Participants had cognition within normal range (>24 on MMSE) but experienced everyday memory difficulties. Ethical approval and participant consent were obtained. Results: Even with very early memory changes participants experienced disruption to occupational performance with negative psychological implications. Themes emerged describing social withdrawal, disruption to activities of daily living, reduced confidence in conversation and feelings of ‘loss of self’. Humour was used to downplay the impact of SMC for participants and self-stigmatisation resulted in lack of help seeking. Conclusion: This study highlights the impact of SMC on occupational performance and the individual’s sense of self. Recognising and challenging self-stigmatisation to encourage help-seeking is
necessary to facilitate early intervention and support to improve health outcomes for older adults with early memory changes. Occupational therapy can offer a key role in identifying functional distress due to memory complaints and in providing education on compensatory strategies and skills to improve occupational performance and health outcomes for older adults with memory difficulties. **Keywords:** Memory; Quality of Life; Complaint; Cognition.

**REMOTE FEEDBACK IN HOMEBASED PHYSICAL ACTIVITY INTERVENTIONS FOR OLDER ADULTS: A SYSTEMATIC REVIEW**

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Home-based physical activity programs for rehabilitation or stimulating physical activity in older adults often have low adherence and vary in effectiveness. The use of remote contact is a viable option that may enhance outcomes. We evaluated existing literature regarding effectiveness and feasibility of using remote feedback for home-based physical activity interventions in older adults. Relevant studies were searched for in PubMed, PsycInfo, Cochrane and Embase. Studies using a remote feedback strategy in delivering a home-based physical activity program for older adults were included. Controlled trials reporting an aspect of physical capacity or activity were rated on the 10-item PEDro quality scale before selection for the effectiveness evaluation. Quality rating had to be above 3 to be included. Feasibility evaluation was performed on all studies reporting an aspect of adherence. The search strategy yielded 2251 articles. Agreement between raters on items of the PEDro scale was 96%. Effectiveness evaluation included 22 studies; 19 reported on physical capacity and fitness outcomes, 5 on physical activity. Quality of these studies ranged from 4 to 8 with a median of 6. Feasibility evaluation included 28 articles. Due to a limited number of articles, mostly moderate quality, variety in methods and outcomes, and lack of comparisons with versus without remote feedback, definitive conclusions cannot be made. Preliminary results indicate that home-based interventions with frequent remote contact are as effective as supervised exercise strategies for enhancing adherence and physical capacity, and more effective than non-exercise strategies for enhancing physical capacity and activity. Two studies using remote contact during exercising showed positive results on physical capacity measures. Future research should focus on added value of providing remote feedback, determining optimal contact frequency and exploring new technologies such as internet strategies. **Keywords:** Physical Activity; Systematic Review; Intervention; Fitness.

**ACTIVE AGEING THROUGH CREATIVE EXPRESSION AND PERFORMANCE**

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Engaging in creative and imaginative activities is an effective and cost efficient way to achieve and maintain physical, emotional and mental health as people age. Singing in a community choir is physically rewarding, with likely improvements in breathing, cardiovascular function, the immune system, mental alertness and mood. Group singing is life reaffirming as people come together to create beautiful and uplifting sounds for their own enjoyment and the pleasure of others. For people with dementia, singing in a choir can also retrieve special memories around individual songs or past experiences. Joining a dance class provides the opportunity for various levels of physical exercise, from line dancing to the tango, within
an enjoyable social framework and is effective for both people who are in good health and people who have a chronic disease such as Parkinson’s. Participating in a theatrical production can improve memory and physical dexterity. Making art requires manual dexterity, focus and concentration, problem solving techniques and visual aptitude. Creative ageing visual arts programs can also successfully cater to people with visual impairment. Photography, combined with nature walks, offers physical activity while also exercising the imagination and cognitive processes and encouraging lifelong learning. The combination of physical exercise and creative activities provides an ideal opportunity for older people to feel socially connected and attain a sense of mastery and achievement. This is critical to maintain self esteem and independence and combat stress, anxiety and loneliness. Active ageing is not just about physical exercise. It is about older people in society being active participants in a liveable community. This presentation will present best practice models of creative ageing programs, both for older people who enjoy good health and people who have a chronic condition such as dementia, supported by scientific research from USA, Australia and UK. **Keywords:** Active Ageing; Mental Health; Dementia; Physical Activity.

THE RISK OF DEVELOPING A NEED FOR LONG-TERM CARE AND THE ASSOCIATED FACTORS IN JAPANESE ELDERLY WOMEN

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This study aimed to identify the risk of developing a need for long-term care in Japanese community-dwelling elderly people using the life functioning questionnaire developed by Shinkai et al. The study also investigated factors affecting long-term care needs to identify the characteristics of healthy elderly individuals who were judged to be at high risk of developing a need for long-term care. The survey was conducted between November and December 2010 involving 120 independent elderly women, age 73.2±4.3, in Himeji city. From the results of comparison of individual data between the high- and low-risk groups, in the high-risk group, age (p < 0.05) and the Geriatric Depression Scale score (p < 0.01) were significantly higher, and length of time able to stand on one leg and the rates of participants who take a walk were significantly lower (p < 0.05 for each) compared with the low-risk group. The risk of developing a need for long-term care and associated factors were compared after adjusting the age and physical performance factors, and a significant correlation was identified between walking and depression (p < 0.05 for each). Although the intensity and amount of walking of the participants could not be investigated in this study, the results indicated that a daily walking habit may reduce the risk of developing a need for long-term care. **Keywords:** Walking; Depression; Elderly; Care.

MOTOR COORDINATION AND VISUAL ATTENTION CONTROL ABILITIES: INTERRELATIONS IN OLDER ADULTHOOD

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**Introduction:** In aging, successful interlimb coordination requires larger attentional control, but the latter is limited by age-related decrements in attentional resources and deficits in visual attentional control. Therefore, it is relevant to understand what specific types of attentional
control are associated with the ability of older individuals to successfully cope with different demands on interlimb coordination. **Methods:** Thirty-two healthy older adults aged 65-80 yrs filled in the International Physical Activity Questionnaire and performed the 6 min walk test, a visual attention test and an interlimb coordination test. The latter consisted in flexions and extensions of hand and foot with in-phase and anti-phase modes at three velocities (80, 120, and 180 bpm). The attention test was a reaction time task in which visual attention was cued by means of spatial cues of different sizes followed by compound stimuli with local and global target features. Indices of focused attention and attentional flexibility were computed. Correlational analysis was performed and in-phase and anti-phase coordination performances were regressed on attentional indices. **Results:** The time spent in sedentary activities was negatively correlated with both indices of visual attentional flexibility and anti-phase coordination performances at highest velocity. After controlling for the prediction accrued by physical activity levels and functional capacity, anti-phase coordination performance was predicted by indices focused attention, but not by indices of attentional flexibility. No association emerged between in-phase coordination and attentional performance indices. **Conclusions:** The results suggest that in aging people, sedentary behaviours are associated with the decline of complex attentional control and motor coordination performances and that different types of attentional control ability may underlie the performance of different and differently complex coordination patterns. **Keywords:** Sedentary behaviour; Physical Activity; Visual Attention; Performance.

A PATHWAY FOR OCCUPATIONAL THERAPY ASSESSMENT AND INTERVENTION FOR PATIENTS WITH DEMENTIA

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The number of people with Dementia is expected to double to 1.4 million within the next 30 years (DOH 2009:9). To ensure that this progressive condition can be better managed from early diagnosis to end of life care, resources must be utilised effectively in the most efficient way. More importantly, the need for effective, quality assessment and interventions is crucial for not only patients with Dementia, but also for their carer. Within the Occupational Therapy Department at King’s College Hospital we recognised the difficulties that we face within an acute hospital setting. There can be an emphasis on the use of the Mini Mental State Examination (MMSE) which does not always highlight full cognitive deficits or relate to function; and there is pressure to reduce length of stay. This led us to evaluate current practice and evidence to develop a Dementia pathway which outlines best practice for occupational therapists. This presentation will describe the pathway which we have developed to ensure effective strategies at all stages of the patient’s journey in the acute hospital, from admission to discharge. It describes assessment methods (including standardised and non-standardised cognitive assessments) to identify the specific cognitive deficits in order to plan interventions. These interventions may include compensatory approaches (eg memory aids/assistive technology) but we also want to promote a more rehabilitative approach (eg errorless learning/sensory stimulation including activities groups) with the focus on enabling people to remain in their own homes for as long as possible. It will also summarise the areas of further development of Occupational Therapy input at King’s College Hospital in relation to current Dementia guidelines. **Reference:** Department of Health (2009) Living well with dementia: A National Dementia Strategy. London: Department of Health. **Keywords:** Dementia; Occupational Therapy; intervention.
PROTECTING MENTAL WELLBEING: CAN BABY BOOMERS DO IT BETTER?

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Background: It is accepted that physical activity can make a contribution to mental wellbeing and the protection of mental health in later life. Evidence includes research for a 2008 UK Government review that showed the link between physical activity and delayed cognitive decline. A 2005 review of mental health problems in later life estimated the prevalence of depressive syndromes in people aged 55+ to be 1 in 7. It identified low levels of physical exercise as a risk factor and the importance of exercise in providing protection. There is also evidence that detection and treatment of cases is poor, with symptoms simply seen as inevitable aspects of ageing. Aims/Objectives: The project aims to explore whether a new generation of older people, the post war ‘baby boomers’, will have a different attitude to protecting their mental health and seeking help if they experience mental illness. This is a generation that grew up with the welfare state and prosperity. They are the healthiest, best educated generation to reach later life and can also expect to live longer. Sociological evidence suggests that their shared experience of social change has created a collective identity that separates baby boomers from previous generations and is shaping their attitudes to ageing. A systematic review of literature on mental health in later life has been undertaken to identify risk and protective factors. A wide range of evidence about the lives of the baby boomer population has also been collected and reviewed by a panel of baby boomers with a range of expertise and experience. To support this overview, in depth face-to-face and survey interviews have been carried out. Results: Fieldwork is not completed but initial analysis confirms many aspects of the hypothesis about a generation that is different from its parents, is more aware of health protection needs and more proactive. Emerging attitudes present challenges as well as opportunities for mental health promotion. Keywords: Physical Activity; Wellbeing; Cognition; Mental Health.

BARRIERS, MOTIVATORS AND LIFE EXPERIENCES OF PHYSICAL ACTIVITY FOR OLDER HOME CARE CLIENTS

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Australia’s ageing population is increasing, and the majority of older people have a desire to live independently in their own home for as long as possible. Being mobile and maintaining strength and balance are important contributors to remaining independent. The aim was to identify and explore levels of, and barriers and motivators to, physical activity of older home care clients who have participated in a restorative home care program which includes a focus on increasing lifestyle activity or received ‘usual’ home and community care (HACC) services. A random sample of 745 clients who received a restorative service and 745 who received HACC were invited to complete a survey. On completion of the survey participants could consent to involvement in a semi-structured interview, 20 interviews were conducted. Survey data were summarised using descriptive statistics and analysed using t-tests and chi-squares to identify significant differences between the groups. Older individuals who had participated in a restorative home care service were more active than similar individuals who had received HACC. The main barriers to being active for both groups were having an ‘ongoing injury/illness’ and ‘feeling their age/or too old’. The main motivators for being active were for ‘health/fitness’ and ‘wellbeing’. Physical activity experiences of interview-
ees included minimal structured sport during their childhood due to a lack of facilities and opportunity. As a result, perhaps, the activities they determine as being physically active in later life include walking and exercise through daily activities such as housework, shopping and gardening. Understanding the benefits of activity and that many participants saw age as a significant barrier, indicates the need to raise community awareness and promote the benefits of staying as active as possible, at an individual level. Exercise programs for this age group may be more successful if designed around each person’s usual life tasks. **Keywords:** Physical Activity; Home Care; Wellbeing; Walking.

### THE ROLE OF REHABILITATION IN IMPROVING WELL-BEING, QUALITY OF LIFE AND FUNCTION IN OLDER AGE

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It is well known that disability increases with age, due in large part to the increasing prevalence of conditions that result in disability, including that of frailty. However, the normal ageing process can also contribute to functional decline by reducing the physiological reserve of many body systems. These two factors can interact and, if occurring gradually, the decline in function may be dismissed as an inevitable part of ageing or chronic disease, with reduced quality of life, well-being and independence. Rehabilitation is generally seen as a time-limited intervention that occurs in response to an acute episode of illness or injury, with the aim of restoring lost function and independence where possible. However, limiting the application of rehabilitation to an acute episode diminishes the role that both multidisciplinary rehabilitation, and rehabilitation principles, can offer in the promotion and maintenance of well-being and physical capacity in the lives of older people, as well as in reversing functional decline that occurs gradually. In the case of gradual functional decline, formal rehabilitation may not be sought as there is no triggering ‘episode’ of onset. This paper provides a narrative review, describing the role that multidisciplinary rehabilitation can have in promoting wellness, function and active ageing in older people, using a person-centred approach. Models of community-based rehabilitation will also be considered. But, unlike much health care, rehabilitation is not a passive process. Exercise, training and chronic disease management requires the active engagement of the individual to be most effective, often with help from a partner or carer. Environmental optimisation and the use of assistive technology may also be needed. However, when such engagement occurs, the individual is empowered, through having a direct role in achieving their goals and pursuing their purposes in life. **Keywords:** Rehabilitation; Wellbeing; Quality of Life; Active Ageing; Intervention.

### LIFT (LOW IMPACT FUNCTIONAL TRAINING): AN INNOVATIVE AND SUCCESSFUL ACTIVE AGEING PROGRAMME BY AGE CYMRU FOR OLDER PEOPLE IN WALES

**Little, Glenn**  
*Age Cymru, United Kingdom*

**Introduction:** LIFT is a series of activities and games designed to get more older people taking part in physical activity in a local environment. Using safe seated exercises that are used during our active daily lives. It is activity that contributes towards a person’s health and wellbeing in a safe and sociable format. It is designed to be used in a variety of community settings. **Methods:** The training course was piloted with potential LIFT leaders and adjust-
ments to the planning of the delivery of the training programme. The training course consists of four days training to enable participants to deliver the session safely and effectively in a local area. Resources produced including manuals, music, games equipment and other resources. In many areas the use of volunteers to deliver LIFT as an alternative to gym based exercise sessions and as a local low cost physical activity that has proved suitable for many older people. The strategy is that it is suitable for people who take part in the courses to be active and attend the sessions for the long term, helping to contribute towards improving their physical, social and mental wellbeing on an ongoing basis. The workshop will explore the opportunities and challenges presented to Age Cymru when developing and delivering the programme and offer participants the chance to consider their capacity to provide a similar programme to enhance the physical activity and wellbeing of older people in their local area. **Results:** Over seventy five people trained to deliver LIFT sessions locally. Weekly, fortnightly and monthly sessions delivered in a variety of locations from community centres, church halls and care and residential homes. Eight LIFT courses delivered, one cascade course and three sub cascade courses delivered. Over five thousand LIFT experiences completed per year. **Keywords:** Active Ageing; Physical Activity; Wellbeing.

**NORDIC WALKING FOR HEALTH IN WALES: AN INNOVATIVE AND SUCCESSFUL ACTIVE AGEING PROGRAMME FOR OLDER PEOPLE**

Little, Glenn

*Age Cymru, United Kingdom*

**Introduction:** Nordic Walking is a popular activity that contributes towards health and wellbeing in a safe and sociable format. Walking with two lightweight specially designed poles that provide support while also increasing the effectiveness of the exercise. Nordic Walking involves the upper body muscles as well as the legs making it an ideal activity for older people to participate in. **Method:** Age Cymru runs an extensive and successful Nordic Walking programme for older people across Wales. The workshop will look at how the programme has been developed, implemented and the results achieved. The use of volunteers to deliver Nordic Walking as a low cost physical activity that has proved suitable for older people as an activity contributing to their wellbeing. The workshop will explore the opportunities and challenges presented to Age Cymru when developing and delivering the programme and offer participants the chance to consider their capacity to provide a similar programme to enhance the physical activity and wellbeing of older people in their local area. The workshop will also look at the recruitment and training of volunteers as peer led instructors and leaders to deliver the programme locally. **Results:** Over sixty peer led volunteers recruited and trained to deliver Nordic walking locally. Regular Nordic Walking courses teaching older people the 10 steps to Nordic Walking as taught across the world. Ongoing walks delivered nationally to enable people who take part in the courses to be active in the long term, helping to contribute towards their participation in 150 min per week as directed by UK Department of Health. **Keywords:** Walking; Active Ageing; Wellbeing; Exercise; Physical Activity.

**COGNITIVE FUNCTION ASSOCIATIONS TO CARDIAC PARAMETERS: ASSESSING AGE EFFECTS**

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Objectives: To assess correlations between cardiovascular autonomic factors and blood pressure with cognitive function across different age groups (18-35, 36-50, and 51-65 years). Different cardiac associations to cognitive domains in these age groups may serve as predictors for cognitive impairment. Methods: Pre and post study blood pressure (BP) was measured and an electrocardiogram (ECG) was obtained during a resting baseline and cognitive task (ECG was used to extract heart rate variability (HRV) data). Two validated and reliable psychometric questionnaires were administered, which assessed different cognitive performance such as orientation, memory, recall, calculation, similarity and construction. Results: Different cognitive domains were linked with the 3 age groups (e.g., 18-35: orientation, 36-50: memory and construction, 51-65: similarity). Blood pressure and HRV parameters were differentially linked to various cognitive domains (such as recall, orientation, memory and calculation) in the 3 age groups. Conclusions: Previous studies failed to evaluate autonomic cardiac factors with cognitive changes over a range of ages. Cognitive performance in particular domains appears to be influenced by cardiac autonomic parameters at different ages - these may serve as predictive markers for cognitive decline. The use of these predictive markers to delay the onset of cognitive impairment would reduce economic costs and preserve cognitive function in the elderly. Keywords: Cognitive Function; Blood Pressure; Cardiovascular; Cost.

SATISFYING EXPERIENCES OF FILIPINO OLDER PEOPLE: ATTRIBUTES TO HEALTHY AGEING

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Background: Literature on ageing especially in the Philippines has focused on the nutritional and physical aspects of the process but rarely have there been studies which delve into the socio-psychological and spiritual aspects as potential attributes to healthy ageing. Aims/Objectives: This paper examines satisfying experiences of Filipino older people which can be considered attributes to healthy ageing. The study draws attention to a qualitative exploration of the different contexts which older people seem to be important in their ageing experience. Methods: The study was conducted in Tacloban City Leyte which is located in the eastern Region of the Philippines. In depth interviews of eighteen participants; nine (9) males and nine (9) females with ages ranging from 60-89 years was conducted. Results: Findings reveal five themes of satisfying experiences of old people which can be considered attributes to healthy ageing. In a collectivist culture such as the Philippines it is not surprising that (1) familial support and the (2) presence of grandchild is considered important. (3) Enjoyment in leisure and social activities is another experience which is considered satisfying because it serves as an outlet for relaxation and socialization. As a predominantly catholic nation, Filipinos are very religious. Thus (4) devotion and religious involvements are also considered as key elements in a healthy ageing experience. Lastly is the satisfaction derived from (5) serving others. It seems therefore that Filipino older people are more concerned in extending themselves to others rather than at the receiving end of a dynamic social interaction. This positive attitude towards others also help mediate in their acceptance of their present status- that of being old. Healthy ageing should not be focused only on the physical and nutritional aspects but should also include the socio-psychological aspects as well. Keywords: Healthy Ageing; Culture; Religion.
“I GOT INTO THE HABIT AND IT HAS DEFINITELY BECOME A PART OF ME”: A QUALITATIVE STUDY OF WHY OLDER ADULTS START AND CONTINUE TO WALK FOR HEALTH

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Brisk walking has been identified by policy makers as a key mechanism through which older adults can achieve current physical activity recommendations. In Scotland, Paths for All promote walking for health in older adults through volunteer led walking groups. The aim of this qualitative study was to investigate the reasons why older adults start and continue to participate in Paths for All walking groups. Following institutional ethical approval, ten older adults (65+ years) who had been walking with Paths for All groups for a minimum of 12 months participated in individual interviews at a place of their convenience. Interviews were audio recorded, transcribed verbatim and the data were analysed using interpretive phenomenological analysis to identify individual and group perspectives. This project is on-going and full findings will be presented at the conference. Preliminary findings indicate that a history of walking, initial beliefs about the benefits of walking, supportive social and physical environment, perceived benefits of walking, walking becoming a habit, and motives for walking have emerged as pertinent themes. The findings will be discussed in relation to current theory and recommendations for practice. Keywords: Physical Activity; Walking; Health.

ASSOCIATION OF SELF-REPORTED HEALTH AND THE PRESENCE OF NUTRITION-RELATED CHRONIC DISEASES AMONG LOW- AND MIDDLE-INCOME ELDERLY FROM SANTIAGO, CHILE

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Objective: To examine the association between poor self-reported health (SRH) and the presence of nutrition-related chronic diseases (NRCD) in elderly subjects. The study also identifies the role of socio-demographic and other variables in relation to SRH. Methods: A cross-sectional study was carried out on 2,800 adults aged 65-67 years from medium- and low-income areas of Santiago, who were taking part in the CENEX study (cost-effectiveness of a nutrition supplement and exercise programme in older people). SRH was measured by the question: “In general, how would you describe your health at present? 1) excellent, 2) very good, 3) good, 4) regular, or 5) bad.” The five categories were dichotomised, combining options 1, 2 and 3 (“good SRH”) on the one hand and options 4 and 5 (“poor SRH”) on the other. Subsequently, the association between poor SRH and NRCD was examined in univariate and multivariate analyses. Results: 56.8% of the participants reported poor SRH. Women were more likely than men to report poor SRH (62.2% and 45.7%, respectively). Univariate analysis showed a strong association between poor SRH and NRCD (Odd ratio (OR) 2.45; 95% Confidence Interval (CI) 1.90, 3.17). This association remained statistically significant after adjusting for potential confounders that showed significant association in the univariate model (OR 2.04; 95% CI 1.50, 2.75; P value: < 0.001). The final model included education, income, depression, cognitive status, alcohol habits, height, and waist circumference (OR of 2.04; CI 1.51, 2.75; P value: < 0.001). Conclusion: The results of this study show that poor SRH is associated with the presence of NRCD regardless of gender.
Individuals diagnosed with any NRCD are twice more likely to report poor SRH than are individuals with no NRCD. Our results illustrate that acknowledgement of SRH may be a useful, cheap and accurate screening tool to assess NRCD in older people, as well as their perception of their own health. **Keywords:** Health; Nutrition; Chronic Disease.

**EFFECTS OF A 6-MONTH MULTIMODAL TRAINING INTERVENTION ON RETENTION OF FUNCTIONAL FITNESS IN OLDER ADULTS: A RANDOMIZED-CONTROLLED CROSS-OVER DESIGN**

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**Background:** Older adults have the highest rates of disability, functional dependence and use of healthcare resources. Training interventions for older individuals are of special interest. The main purpose of this study was to assess the immediate and long-term effects of a 6-month multimodal training intervention (MTI) on functional fitness in older individuals.

**Methods:** The MTI consisted of daily endurance and twice-a-week strength training. The method was based on a randomized-controlled cross-over design with four phases: 1) Enrollment and baseline assessment, 2) immediate 6-month intervention compared with controls, 3) crossover phase with delayed 6-month intervention by the control group, and 4) additional 6-month follow-up. **Results:** After 6-month MTI, the intervention group improved in physical performance compared with the control group via Short Physical Performance Battery (SPPB) score (mean diff = 0.6, p < .05), in 8-foot up-and-go test (mean diff = -1.0 s, p < .001) and in 6-min walking test (mean diff = 44.2 m, p < .001). In strength performance via knee extension the intervention group improved (mean diff = 55.0 Newton, p < .001) while control group declined, and also in PA (mean diff = 125.9 cpm, p < .001). Overall MTI effects in long-term improvements (phases 1–4) from both groups together came through in SPPB (mean diff = 1.1, p < .001), in 8-foot up-and-go (mean diff = -0.9 s, p < .001), and in 6MW (mean diff = 18.7 m, p < .01), but maintained compared to baseline in knee extension (mean diff = 4.2 Newton, p > .05), in PA (mean diff = -4.0 cpm, p > .05), and in Icelandic quality of life (mean diff = 0.3, p > .05). **Conclusions:** The results present that multimodal training intervention is feasible and beneficial in older populations. Our findings support the inclusion of exercise as an integral part of the prevention and management of chronic disorders of older individuals, and may positively influence their ability to stay independent, thus reducing the need for institutional care. **Keywords:** Fitness; Disability; Physical Performance; Exercise.

**MORE THAN MANAGING: PERSONAL RESOURCES AS FACILITATORS OF LEISURE PARTICIPATION FOLLOWING AN ACUTE HEALTH CRISIS**

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This study was designed to examine factors influencing successful aging from the perspective of adults who were transitioning home following an acute health crisis, which led to hospitalization and rehabilitation. The current analysis focused on identifying factors that participants felt would influence their abilities to engage in valued activities following return to their homes. Eleven adults (ages 53 to 89 years) participated in in-depth qualitative interviews...
on two occasions: one month and three months following discharge from the rehabilitation unit. Profiles were constructed for each participant to examine their leisure participation in the context of their self-appraisals of available personal and external resources. Cross-case thematic analysis revealed significant differences in the trajectories of activity engagement experienced by study participants. Study participants who were able to garner necessary resources to continue with, substitute, or even expand their participation in leisure activities appeared to be coping, adapting, and to have a sense of psychological resilience. When the necessary resources were not there participants’ activities appeared to be oriented to “filling time” or “getting by.” Although some participants had access to external resources that would support activity participation (e.g., access to adaptive aids, instrumental supports, and social groups) this was not sufficient for taking action. Participants who appraised their abilities/resources and activities favourably seemed to possess: a sense of life purpose, self-perceptions that their abilities were sufficient for preferred activities, knowledge of compensatory strategies, and a repertoire of activities or interests to draw from when they could no longer do some activities. Beyond helping people better manage health problems, there is a need to help people learn ways to live well with their condition, by strengthening personal resources for leisure participation. **Keywords:** Leisure; Rehabilitation; Health; Resources.

**THE EFFECTS OF SOCIAL SUPPORT, GENERATIVITY AND DEPENDENCE ON PERCEIVED HEALTH: A STUDY IN AN ELDERLY ANGOLAN SAMPLE**

Gutierrez, Melchor; Tomás, José Manuel; Cebrià, M. Àngels; Sancho, Patricia; Galiana, Laura

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Among the main domains representing quality of life in the elderly, health takes a primary place (Prieto-Flores, Moreno-Jiménez, Fernández-Mayoralas, Rojo-Pérez, & Joao, 2012). Perceived health, as the individual’s perception of his or her health status, is seen as an essential complement to the traditional indicators in the assessment of health studies (Hunt, McKenna, McEwen, Backett, Williams, & Papp, 1980). Several factors have been identified as predictors of perceived health, being social support (Bisconti & Bergeman, 1999), generativity (Efklides, Kalaitzidou, & Chankin, 2003), and perceived dependence/autonomy (Grewal, Lewis, Flynn, Brown, Bond, & Coast, 2006) of particular interest. The main aim of this study is to assess and estimate the predictive power of social support, generativity, and dependence/autonomy on perceived health in a sample of 1003 Angolan elderly. A Multiple Indicators Multiple Causes (MIMIC) model was estimated and tested. Several predictors of a latent factor of perceived health were included in the model, specifically: measures of social support (emotional support from friends, perceived adequacy of social relationships, priority for social support), active aging (dependency, competence, internal locus of control and performance-related quality of life), and generativity. This model reasonably fitted the data: \(\chi^2 = 566.05, p < .01, \text{CFI} = .92, \text{GFI} = .89, \text{SRMR} = .06, \text{and RMSEA} = .11\). Results showed significant effects of several exogenous variables on perceived health. Overall the amount of perceived health variance explained for was a 38.6%, the largest effects being those of priority for social acceptance (beta = .22) and perceived competence (beta = .25). Results are related to those found in the literature, and the strengths of the research, are highlighted. **Keywords:** Quality of Life; Social Support; Autonomy; Active Ageing.

**HOW SOCIAL SUPPORT, GENERATIVITY AND DEPENDENCE CONTRIBUTE TO SATISFACTION WITH LIFE: A STUDY IN AN ELDERLY ANGOLAN SAMPLE**

Galiana, Laura; Sancho, Patricia; Gutierrez, Melchor; Tomás, José Manuel; Cebrià, M. Àngels

*University of Valencia, Spain*
Life satisfaction has long been identified as a part of subjective well-being (Andrews & Withey, 1976; Diener & Emmons, 1984), and it is referred to a cognitive, judgmental process (Diener, Emmons, Larsen, & Griffin, 1985), in which person’s quality of life is globally assessed according to his/her chosen criteria (Shin & Johnson, 1978). Thus, life satisfaction is a conscious cognitive judgment, based on the comparison of one’s life with a self-imposed standard or set of standards, which lead to a global assessment of life (Pavot & Diener, 1993). Many constructs have been related to life satisfaction and other components of well-being, such as social support (Theurer & Wister, 2010), generativity (McAdams, Aubin, & Logan; 1993), perceived control (Infurna, Ram, Wagner, Gerstorf, & Schupp, 2011), or perceived dependence/autonomy (Cox, Green, Seo, Inaba, & Quillen, 2006). The aim of the research is to study the predictive power of social support, generativity, and dependence/active aging on life satisfaction in a sample of 1003 elderly from Angola. A Multiple Indicators Multiple Causes (MIMIC) model was estimated and tested. Several predictors of a latent factor of life satisfaction were included in the model, specifically: measures of social support (friends emotional support, social relationships perceived adequacy, priority for social support), active aging (dependency, competence, internal locus of control and performance-related quality of life), and generativity. The model adequately fitted the data: chi-square 237df = 424.23, p < .01, CFI = .95, GFI = .92, SRMR = .03, and RMSEA = .10. Results showed significant effects of many exogenous variables on life satisfaction. Overall the amount of life satisfaction variance explained for was a 56%, the largest effects being those by social support (beta = .65) and emotional support from friends (beta = .15). Implications for these results are discussed, and research strengths, like the sample particularity, are highlighted.

Keywords: Satisfaction, Quality of Life; Wellbeing; Social Support; Active Aeging.

AN AUDIT OF AN ACTIVITIES SERVICE IN AN ACUTE CARE SETTING

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Older people are the largest group of consumers of healthcare and it is recognised that acute hospital admission causes considerable physical and psychological stress (Edvardsson & Nay 2010:64). King’s College Hospital has recognised this and we are fortunate to have an activities service which we believe to be unique in such a large acute hospital in the UK. This service has three staff and covers the elderly care wards. Any member of the multi-disciplinary team can refer and we see patients for group or individual treatments. The service aims to enhance quality of life, help patients to rediscover their interests and potential, promote socialisation and reduce the impact of hospitalisation. Activities vary depending on patient’s needs/ interests but can include reality orientation, reminiscence, exercise, quizzes and crafts. We try to ensure that we meet patient’s individuals needs – it is recognised that most healthcare staff have limited time and high workloads; having dedicated staff who can give even a few min of “calm, attentive listening” has been shown to be beneficial for patients (Edvardsson & Nay 2010:67). Activities, however, may be seen as a luxury and not an essential component of acute care. There are challenges to providing this service in such an acute setting but we have anecdotal evidence that our service is highly valued by patients. Mindful of the current financial climate and the emphasis on evidence based practice, we felt that it was important to formally evaluate our service. We therefore carried out an audit of the numbers/ type of referrals received, attendance rates at the groups and patient feedback. This presentation will describe our service, summarise the results of this audit and discuss our plans for the future in terms of service development and further research. References: Edvardsson D. & Nay R. (2010) Acute care and older people: chal-
The impact of a new sensory environment on ward activities

Christians, Jean; Stuart, Laura
King’s College Hospital, UK.

Admission to an acute hospital can be an overwhelming experience for older people. The National Dementia Strategy highlighted that it is even more challenging for those with cognitive impairment. King’s College Hospital (KCH) has undergone a £265,000 refurbishment of one of its elderly care wards into a unique, sensory environment. The ward was formally opened in Dec 2011 and is already providing an improved environment for dementia patients, staff and visitors. Key features of the ward: mood lighting to promote relaxation/reduce agitation; atomisers with fragrance to aid relaxation; day/night clocks to help orientation; non-slip flooring to reduce falls; colour coded bays/new signage to improve patient’s orientation; artwork/memory boxes to trigger memory/promote discussion; interactive boxes to promote visual/tactile stimulation; audio visual system in the sensory room to project changeable images. Activities groups take place in the sensory room with the aims of promoting socialisation and lessening the impact of hospitalisation. Activities include reality orientation, reminiscence, exercise, quizzes and crafts. We also have portable sensory equipment which can be used by staff/families with patients unable to attend the groups eg because they are unwell or in isolation. This includes atomisers, relaxation CDs, audio equipment and fibre optic equipment. This presentation will highlight the ways in which the sensory environment has increased the effectiveness of these groups: the room is more inviting and provides a non-clinical setting; patients are more relaxed; use of mood lighting and fragrance helps relax/stimulate patients and improve concentration; the memory boxes and pictures provide a focus for discussion. Reference: Department of Health (2009) Living well with dementia: A National Dementia Strategy. London: Department of Health/ King’s College Hospital (2011) Kings Sensory Project: The Transformation of Marjory Warren Ward. London: KCH. Keywords: Cognition; Dementia; Elderly; Exercise.

The training of the monitors that work in physical activity and sport programs with older adults in Spain

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Introduction: An essential factor that contributes to health in older adults are the physical activities monitors, because if these professionals are not good trained, the effects in general health could have a boomerang effect. Objective: To analyse the training of the physical activities professionals who work with older adults by age, gender and sport associations. Methods: The quantitative methodology consisted of a cross-sectional survey that was conducted through a standardized personal interview using a questionnaire. The final sample size was 361 monitors (63.2% men, 36.8% women). All the statistical analyses were done using the SPSS/Windows 19.0 statistical software. The inferential analysis with Cronbach’s was .785. Signification levels were set at p < 0.05. Results: 41% of the sports monitors who work in physical activity and sport programs with older adults are not qualified. 59% of monitors have a sports qualification. By gender, 64% of men have a sport qualification and
36% of them do not have any sport qualification, regarding to women, 50,4% have a sports qualification and 49,6% of them do not have any sport qualification. By age, 65,4% of the sport monitors under 30 years are qualified and 34,6% are not; 56% of the monitors older than 45 years are qualified but 50% of them are not qualified. By organizations, 42,1% of the monitors who work in private organizations are not qualified and 57,9% of them have a sports qualification; in public organizations, 30,6% of the monitors do not have any sport qualification but 69,4% have sport qualification. Conclusions: About half of these monitors do not have any sport qualification and women show higher values of non qualified staff than men. In private sport organizations, the number of non qualified sport monitors is higher than in public sport organizations. Funding: The research reported is a part of the Fundamental Research Project I+D+i DEP2009-12 828 which has been funded by the Ministry of Science and Innovation. Keywords: Physical Activity; Sport; Training; Monitors.

PERCEPTION OF IMPORTANT LEADERSHIP OF MONITORS WORKING WITH PROGRAM PHYSICAL ACTIVITY OF OLDER ADULTS IN SPAIN

Campos, Antonio1; González, Dolores2; Martínez, Gustavo3

1 Polytechnic University of Madrid, Spain; 2 Alcalá University, Spain; 3 Government of Region of Valencia, Spain

Introduction: The importance of human resources programs that develop physical activity and sport is essential for safe and effective implementation and to ensure the benefits of physical activity and sport as well as the influence of its leadership. Objective: To study the perceptions of the importance of leadership in the work of the monitors physical activity and sport programs with older adults in Spain and their analysis by gender and age.

Methods: The quantitative methodology consisted of a cross-sectional survey that was conducted through a standardized personal interview using a questionnaire. The final sample size was 361 monitors (63,2% men, 36,8% women). All the statistical analyses were done using the SPSS/Windows 19.0 statistical software. The inferential analysis with Cronbach’s was .785. Signification levels were set at p < 0.05. Results: 11,1% of the monitors perceive that leadership is not important, 18,3% important and 70,6% very important. By gender, 11,8% of men believe that leadership is not important, 18,4% important and 69,7% very important; and 9,8% of women perceive that leadership is not important, 18,1% important and 72,2% very important. By age, 12,8% of monitors under 30 years believe that leadership is not important, 19,6% important and 67,6% very important; 10,8% of monitors 30 to 50 years perceive that leadership is not important, 18,2% important and 71% very important; and 4% monitors over 50 years believe that leadership is not important, 12% important and 84% very important. Conclusions: Most monitors programs working in sport and physical activity with older adults in Spain perceived that the leadership in their very important job, women more than men and as age increases perceived leadership is more important. The research reported is a part of the Fundamental Research Project I + D + i DEP2009-12 828 which has been funded by the Ministry of Science and Innovation. Keywords: Leadership; Physical Activity; Sport; Monitors.

ACTIVE AGEING AND SIGHT LOSS

Ambler, Phil1; Sheehy, Rebecca2; Nevin, Mark3

1 UK Vision Strategy, UK; 2 Royal National Institute of Blind People, UK; 3 Optical Confederation, UK
Sight loss greatly impacts individuals’ wellbeing and ability to maintain an active lifestyle as they age. The older you are the more likely you are to be living with sight loss: around 1 in 9 people over the age of 60 are living with sight loss; increasing to around 1 in 3 people over the age of 85. People with sight loss must acquire a whole new set of skills and learn new coping strategies. 20% of blind and partially sighted people over 75 won’t have left their home in the last week, or even been into their own garden. UK Vision Strategy wishes to present a workshop which highlights the prevalence and impact of sight loss in the UK, notes prevention strategies, and examines what Active Ageing means for blind and partially sighted people. How can wellbeing and quality of life be improved, how can barriers to an active lifestyle be removed, how can important health messages be conveyed and acted upon? We will present two pieces of research on this area. Firstly we will present Future Sight Loss UK, epidemiological research detailing the prevalence and cost of sight loss in the UK and the impact on quality of life. Secondly we will present findings from: Finding Your Feet (DH (England) Innovation Fund Project; Looking Forward Programme (Scottish project). Finding your Feet, supports individuals through peer support and coproduction to improve wellbeing and quality of life whilst promoting important health messages and active living. Workshops allow people to share information, experiences and emotions, challenge each other’s assumptions about their capacity to cope with sight loss and build their own and each other’s confidence. This lays the foundations for people to achieve their ambitions of an active and healthy life. Similarly, Looking Forward uses group sessions to create a supportive environment where people discuss problems and solutions with others who are experiencing similar difficulties allowing them to regain independence. Keywords: Active Ageing; Visual Impairment; Wellbeing; Quality of Life; Active Ageing.

CREATIVE ARTS FOR THE WELLBEING OF OLDER PEOPLE

Burns, Jane1; Oliver, Sue2; Karkou, Vicky1

1Queen Margaret University, UK; 2Freelance, UK

This study was funded through the Centre for Older People’s Agenda (COPA), Queen Margaret University. Esquivel and Hodes’ (2003) definition of creativity was adopted, namely, a person’s ability to produce new original ideas irrespective of the discipline they are working in. Its development, they believe, is influenced by social and cultural factors. This collaborative research project explored the experiences of creativity for recently retired people in terms of their perceived wellbeing. An action research methodology was used to involve a group of fifteen volunteers from the local community. Two co-researchers from the same age range but from outside the area were invited to monitor the process. Recorded semi-structured interviews with focus groups generated qualitative data which gave insight into how and why they engaged in the arts (or not), and what they felt they gained from their involvement. A day of arts workshops was organised, which comprised visual art, drama, music and dance, with the emphasis on individual and group creativity rather than following prescriptive instruction. Hence they felt a heightened sense of ownership of the creative work. To ensure triangulation, these were observed by the researchers and co-researchers, and were followed by a group discussion. Key findings were that the feeling of belonging to a community was important; friendships were formed and new skills were acquired through art activities, which challenged and stimulated the participants socially and cognitively. The stimulation of new forms of creativity was perceived to be beneficial to mental and physical wellbeing, but the activities had to be fun as well. Reference: Esquivel, GB and Hodes, TG.
Tuesday 14th August  

2003. Creativity, Development and Personality. In J Houtz (ed.) The Educational Psychology of Creativity Ch.7, pp. 135-163. Hampton Press, Cresskill, NJ. **Keywords:** Art; Wellbeing; Elderly; Creativity.

**HOW INTERVAL GYM TRAINING HAS AN EFFECT ON SENIORS OVER 70 YEARS**

*Laaksonen, Hannele; Oksanen, Jukka*

*Center of Ageing, Finland*

**Background:** The amount of seniors is increasing rapidly in Finland over the next few decades. The Finnish inpatient service system shall be terminated in the coming years and services are offered more at seniors own homes. Seniors that are living at their own homes can meet some risks such as loneliness, decrease of physical abilities and quality of life as well as depression. **Aim:** To analyze the influence of interval gym training on seniors’ over 70-years physical skills, quality of life, depression, and social relationships. **Method:** The study was carried out in Finland during years 2010-2011 and it continued 15 months. Structured questionnaires were used as a data collection method by group interviewing. Study group participants were collected from home living seniors, who were volunteers (N = 97) to participate two times a week to guided gym training. Control group (N = 75) participants were selected by systematic sampling from home living seniors. The data was analysed statistically by using SPSS software. **Findings:** Study group: During a half year follow-up time physical (p = .034) and sleeping abilities (p = .006) got better. During one year follow-up time urination and evacuation (p = .004) and daily activities (p = .013) got better. At the same time depression (p = .000) and anxiety (p = .001) decreased significantly. Hand grip strength of both hands (p = .000) got better during a half year follow-up time, up from the chair got better both half year (p = .000) and one year (p = .000) follow-up times. Control group: None of the above mentioned changes were occurred. The results were almost significant in depression test, where three variables got worse during one year follow-up time. Two variables of social activity-test got worse too. **Conclusion:** Guided, interval gym training two times a week can increase over 70-years old seniors’ physical skills, quality of life and social relationships as well as prevent depression. **Keywords:** Depression; Quality of Life; Gym Training; Social Relationship.

**THE USE OF EFQM CRITERIA ON THE PHYSICAL ACTIVITY PROGRAMMES FOR ELDERLY PEOPLE: RESULTS OF A CLUSTER ANALYSIS**

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*1CIAFEL, Portugal; 2Universidade do Porto, Portugal.*

**Background:** Quality is an important issue when designing a physical activity (PA) programme for older people. The Excellence Model of the European Foundation for Quality Management (EFQM) has been widely suggested as an operational framework for evaluating the quality of an organization. In this study we apply the EFQM framework to the context of PA programmes for older people in Portugal. **Aims:** 1) to distinguish groups of PA programmes according to the implementation of the quality management practices (QMP), and 2) to provide an exploratory characterization of the identified groups concerning the profile of the programmes’ coordinators and the programmes’ features. **Methods:** A meth-
odological triangulation was conducted in 26 PA programmes using questionnaire surveys, semi-structured interviews and document analysis. Cluster analysis using Ward’s method of agglomeration with squared-Euclidean distance measures was used to identify subgroups of PA programmes based on the results of the QMP associated with the EFQM’s criteria. The significant differences in categorical variables and continuous variables among subgroups types were compared with the chi-square test and the Kruskal-Wallis test, respectively.

Results: We identified four clusters of PA programmes. They differ essentially in degree of implementation of each EFQM’s criterion and scope of all criteria. No significant differences were found between clusters for their general characteristics, except for the number of facilities managed by the programme (p ≤ 0.05).

Conclusions: Clustering identified four subgroups of PA programmes. The number of facilities is significantly associated with the created clusters. Since the quality of a service increases customer satisfaction, the continuous improvement of the PA programmes should be implemented to increase elderly satisfaction and adherence. Keywords: Physical Activity; Satisfaction; Management Practice.

LANARKSHIRE MOVERS AND SHAKERS CHAIR BASED EXERCISE PROJECT
Flannigan, Lynn1; McWhinnie, Anne2; Lafferty, Linda3
1NHS Lanarkshire, UK; 2Alzheimer's Scotland, UK; 3South Lanarkshire Council, UK

The aim of this project is to increase exercise opportunities for frail older people in Lanarkshire’s care homes and day care units. The project aims to enable staff to confidently and safely deliver chair based exercise. The physical and psychological benefits of exercise are well known, however, opportunities for frail house bound older people can be very limited. A half day training session is delivered on a monthly basis by a NHS physiotherapist, an Alzheimer’s Scotland trainer and Local authority staff with a special interest in activity of older people. The training consists of theory and practical elements. The theory covers aspects such as the potential benefits of chair based exercise, common medical conditions, precautions, and general delivery advice. The practical aspect of the training covers general chair based exercises, the use of equipment and relaxation. Evaluation of the project is underway in terms of numbers of staff trained, service-user and staff feedback and amount of activity time. Initial feedback from staff and service-users alike very positive. Keywords: Exercise; Elderly; Care Home.

LIVING WELL IN NORTH LANARKSHIRE
Callaghan, Paul; Blair, Sandra
North Lanarkshire, UK

This workshop will showcase some of the innovative developments that have or are being implemented in North Lanarkshire Council. These projects promote positive engagement with older people living in North Lanarkshire. Some of these initiatives are: Safe Walking - This has involved the use of GPS technology to assist people with a cognitive impairment to remain active in their community. Dementia Capable Community - We are working in partnership with the local business community to raise awareness of dementia and improve the business community’s capacity to cater for people living with this condition. Locality Link Officers- This is a well established service that assists older people to participate and keep connected to their community. Living Well Strategy which the council and its partners have implemented to ensure that older people are valued as active members of our society. Keywords: Walking; Technology; Dementia
INTEGRATED MEMORY STIMULATION: WHAT’S THAT ALL ABOUT?

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1NHS Highland, UK; 2 Fortrose, Highlands, UK

Integrated Memory Stimulation (IMS) was developed by the authors from their clinical experience as Occupational Therapists after memory training in Europe. The authors questioned why training was not available in the UK for well older adults with subjective memory issues to prevent decline in mental well-being, skills and self-efficacy. Community opportunities exist for well older adults in some areas but nothing for subjective memory issues to improve self-management. The model of IMS was developed to improve mental well-being via a multi-factorial programme with integrated activities focusing on memory and cognitive training, information processing training, health education, physical and social activities. This is a groupwork programme. A systematic review was supported by a review of current evidence on each component of the IMS model with funding from The Bupa Foundation. A 13 week intervention programme with two booster sessions was developed. No other comprehensive and synthesised piece of work focusing on the full range of elements involved in IMS was found during the review. Current evidence from each of the components of IMS will be presented i.e. markers to improve mental well-being; improving self-efficacy; elements that influence subjective memory issues; techniques, strategies and activities from the programme; benefits of social stimulation; training for trainers; and effects of physical exercise. Demographics provide stimulus and justification for developing new models with an evidence base for the increasing number of older adults who experience subjective memory issues. The model of Integrated Memory Stimulation can be seen as a means of a new service development in self-management. The ultimate aim is to pilot the intervention of Integrated Memory Stimulation and if proved efficacious, roll out throughout the UK for the benefit of people who are experiencing subjective memory issues which affects their well-being. Keywords: Wellbeing; Memory; Cognition; Exercise; Demographics.

IMPACT OF THE SOCIAL EDUCADOR ACADEMIC SKILLS IN THE ACTIVE AGEING PROMOTION

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Polytechnic Institute of Viseu, Portugal

The Social Education, aiming to empower people and social groups with relevant resources to address the challenges of their historical moment, for their cultural, social and economic inclusion (Caride, 2005), has an important role in the emerging social challenge of demographic aging. The academic preparation of Social Educator Workers should be based on the Active Ageing paradigm (WHO, 2002), in order to contribute actively in health promotion and in the improvement of new opportunities of participation and citizenship through a socio-educational intervention. The aim of our study is to explore the impact of the Academic skills developed in the Social Education Degree of the Polytechnical Institute of Viseu on the active ageing promotion. The design was an exploratory study, with a sample of social education interns (n = 29), practice supervisor (n = 12) and elderly participants (n = 110). The Practice included several activities in institutional and community context. Physical activity was selected as the favourite for most of the participants (90%). The results impact for the developed activities, on target population, show personal, socio-educative and community benefits, being the personal dimension the mainly reported for the practice supervisor (46.2%) and for the education interns (79.7%). The most valorized personal dimension subcategories...
for both groups were the “interpersonal relationships” and the “increase of occupational
dynamics.” 90% of the elders inquired referred to “be more happy” and 85% “learn new
things.” Through the professional practice the Social Education Degree Academic Skills
reveals a positive effect in active ageing promotion of the target population. The Practice
is evaluated by the three groups (interns, practice supervisor and elderly participants) as
important for the personal, socio-education and community development. **Keywords:** Active
Ageing; Demographic Ageing; Physical Activity

**REACH FOR ACTIVE AGING: RESEARCH EDUCATION ALLIANCE FOR
CHANGING HEALTH**

*Evans, Ellen M.; O’Brien, Anne E.*

*University of Georgia, United States*

The obesity epidemic, combined with the aging demographics, is predicted to produce a
society afflicted with chronic diseases and loss of independence. Future work needs to move
the vast amounts of evidence-based research findings into effective sustainable community
programs. A recent federal grant call titled “Translational Research to Help Older Adults
Maintain their Health and Independence in the Community” emphasizing partnerships
between academic research centers and community-based organizations highlights this
need. One of the most consistent correlates of physical activity and nutrition behaviors is
self-efficacy. Framed in the well-known social cognitive theory (SCT) of Bandura, self-
efficacy expectations reflect individuals’ beliefs in their capabilities to successfully meet a
challenge, the effort they put into chosen behaviors, and how long they persist when faced
with obstacles to their goal. Theoretically based in SCT, peer coaching has been shown to
be highly effective in fostering positive health behavior change. Recent data suggests that
older adult peer or undergraduate student mentors are equally effective for improving fit-
ness in older adults. Our academic unit has successfully partnered with the Osher Lifelong
Learning Institute (OLLI; a university-affiliated volunteer adult education organization
with ~1000 older adults), with a practicum capstone course which parallels our academic
course, titled “Physical Activity and Aging,” to deliver a physical activity program to older
adults. The planned second phase will partner with Human Kinetics to adapt Active Living
Every Day and Healthy Eating Every Day, two evidence-based behavior change programs,
for the OLLI curriculum and will combine older adult peer coaches with our students. This
integrated approach will serve as a highly effective and sustainable program for older adults
in the community while simultaneously providing critical experiential training for our future
professionals. **Keywords:** Health; Active Ageing, Obesity, Disease; Physical Activity

**NORDIC WALKING AND ACTIVE AGING CONCEPT**

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It is well-known that lifestyle and behaviour have a greater influence on how people age
than any other factor, including genetics. Regular physical activity is a scientifically-based
means of reducing the risk of a number of diseases, contributing to prolonged independent
living and enhanced quality of life. Of particular concern is a very low physical activity
levels typical among older individuals. Policies and programmes should encourage inac-
tive people to become more active as they age and to provide them with opportunities to do
so. It is right time to strive for a behavioural change both in minds and policies. Through coordination and collaboration, consistent messages and programs pertaining to active lifestyle we may have a significant impact on society and lead to long-term, positive change. Nordic walking seems to be in keeping with the main principles of the active living and active aging concepts. It possesses definite advantages such as functionality, safety and availability for almost everyone, moreover it helps to involve elderly people into the process of health maintenance as well as into the social relationships maintenance therefore it can serve as a universal tool of active aging. The experience of the northern countries and namely of Finland shows that such activities are highly in demand for those who are searching for some available method to keep fit and competitive in the changing world. In Europe this concept becomes more and more popular involving people trying to avoid all the negative changes aroused by aging. In SPb we launched a study to analyse the reasons to evade physical activity, search for education strategies to inform older adults about the personal benefits of active aging and teach them how to practice NW, as well as to design guidelines for adoption of NW as physical activity for geriatric and day care centres. **Keywords:** Nordic Walking; Active Ageing; Lifestyle; Behaviour; Quality of Life.

**IMPACT OF BODY COMPOSITION AND PHYSICAL ACTIVITY ON FATIGUE IN OLDER MEN AND WOMEN**

_Ward, Christie L.1; O'Brien, Anne E.1; Valentine, Rudy J.2; Evans, Ellen M.1_

1University of Georgia, United States; 2Boston University School of Medicine, United States

Fatigue is a common complaint among older adults. Higher levels of habitual physical activity (PA) and lower adiposity have both been shown to be associated with increased perceptions of energy. Although across the lifespan, women report more fatigue than men, data from our lab and others demonstrate equivocal evidence for sex disparity in fatigue. The aim was to determine if relations among PA, adiposity (%Fat), central adiposity (%C-Fat) and fatigue differ in older men and women. Adults (n = 325, 43% male, 71.7±7.1 yrs) were assessed for body composition by DXA and PA by questionnaire. Fatigue was measured via the Multi-dimensional Fatigue Inventory, in which higher scores indicate greater fatigue [general (GEN), physical (PHY), mental (MEN), reduced activity (R-ACT), reduced motivation (R-MOT)] and the Vitality Scale (VIT) of the SF-36. Because stress and sleep quality are known determinants of fatigue, the Perceived Stress Scale and the Pittsburg Sleep Quality Index were also administered. Males had greater PA, lower %Fat (32.1±7.6% v 37.2±9.2%) and %C-Fat (32.0±8.2% v 39.1±13.4%) compared to females (all p < .01). Females reported more mental fatigue (MEN; 8.3±3.5 v 7.5±2.8; p = .03) and poorer sleep quality (4.6±3.1 v 5.0±3.2; p = .05) than men. Sleep quality and perceived stress were related to all measures of fatigue in both sexes (all p < 0.05), thus were controlled in subsequent analyses. In women, %Fat was related to GEN (r = .17, p = .03) and R-MOT r = .17, p = .03);%C-Fat was related to GEN (r = .15, p = .05) and R-MOT (r = .24, p = .002) and PA was correlated with GEN, PHY, R-ACT, and R-MOT (r range = -.23 to -.33, all p < .05). In men, %Fat and %C-Fat were not related to any measures of fatigue (all p > 0.05); while PA was correlated with VIT (r = .25, p < .01) and GEN, PHY, R-ACT, R-MOT (r range = -.20 to -.27, p < .01). PA may be an important behavioral target to reduce fatigue in both older men and women with the latter cohort also potentially benefiting from reducing adiposity. **Keywords:** Physical Activity; Fatigue; Body Composition.
E-CORE (EMBODIED COGNITIVE REHABILITATION): A NOVEL COGNITIVE REHABILITATION SYSTEM USING TANGIBLE TABLETOP INTERFACES

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Korea Institute of Science and Technology, South Korea

In this study, we present a novel cognitive rehabilitation system using tangible tabletop interface (TTI) that consists of tangible object and digital tabletop. Since most computer-based cognitive rehabilitation systems are only emphasizing on cognitive task, the role of body in cognitive rehabilitation has been less appreciated. While, conventional occupational therapies using real objects has shown good results in cognitive rehabilitation and become a good compensation to meet another need in cognitive rehabilitation program. In order to reinforce the coupling of body and mind as well as support cognitive training objectively, intelligent tangible objects and computerized table with digital contents should be combined as a platform for cognitive rehabilitation. TTI comprises of a tabletop interface serving as presenting digital contents and recognizing touch interactions on display, tangible objects equipped with various sensors to detect user’s natural manipulations, and a stereo camera to recognize user’s gestures. Based on the result of focus group interviews with experts to develop a training program, we built a cookie making game as a case of instrumental activities of daily living. The game, training three dimensions of cognitive abilities (memory, attention and executive ability), has tasks such as memorizing and making various types of cookies using tangible tools (cutter, syrup and topping container). A heuristic evaluation was conducted by experts to investigate the usefulness of the system. Five experts reported the system well explains how interacting with real objects and environments help train cognitive abilities based on an overarching theory of embodied cognition and situated cognition. In addition, they were positive to use this intuitive interface that allows close coupling of action space and perception space to address cognitive mismatch caused by the disposition between information and interface. Keywords: Cognition; Rehabilitation; Technology.

PERCEPTION AND ATTITUDE OF STUDENT NURSES TOWARDS THE CARE OF ELDERLY PATIENTS IN ILE-IIFE, NIGERIA

Faronbi, Joel; Adebowale, Olabisi

Obafemi Awolowo University, Nigeria

This study assessed the perception, attitudes and knowledge of student nurses towards the care of elderly in Ile-Ife. Utilising a cross-sectional quantitative descriptive design, 280 respondents were selected through a systematic sampling technique from institutions of learning for nurses in Ile-Ife. Data were collected with the aid of validated self-administered questionnaire and analysis including descriptive and inferential statistics was done using Statistical Package for Social Sciences. Result showed that respondents believed that nurses should be patient, cheerful and sensitive (97.2%); as well as empathetic (91.4%) when caring for the elderly. They further expressed that caring for the elderly goes beyond the basic nursing care (66.1%) and 90% of the respondents thought that there is a need for an elderly care unit in the hospital. This study revealed that 66.1% and 71.8% respondents had a positive perception and attitudes towards the care of older people respectively. Sixty% demonstrated good knowledge of essential clinical practice in the care of older patients. However, the result showed that, there is no significant relationship between knowledge and attitude of the respondents ($\chi^2 = 2.43; df = 2; p = 0.296$), and no significant relationship exist between age and attitudes of the respondents ($\chi^2 = 7.29; df = 3; p = 0.063$) The study concluded that
the positive perception and attitude as well good knowledge demonstrated by student nurses towards the care of the elderly should be reinforced; this will subsequently enhance a better clinical outcome in the care of the elderly.

EVALUATING THE IMPACT OF ALLOTMENT AND COMMUNITY GARDENING FOR OLDER PEOPLE’S HEALTH AND WELL-BEING

Hawkins, Jemma¹; Clayton, Debbie¹; Thirlaway, Katie¹; Mercer, Jenny¹; Backx, Karianne¹; Milbourne, Paul²

¹Cardiff Metropolitan University, UK; ²Cardiff University, UK.

Background: There is a growing interest in the potential added benefits to health of conducting physical activity in contact with nature but there is a lack of research in this area that has focused on older adults. There is also emerging evidence which suggests a potential role of allotment and community gardening projects for enhancing individuals’ health and well-being, however, robust evidence demonstrating how and why gardening may be beneficial is limited. In addition, it is not known whether the benefits of gardening individually as the sole tenant of a plot of land are different to gardening communally on a shared plot of land.

Aims/Objectives: The ‘Growing a Healthy Older Population in Wales Project’ (GHOP) was funded by the National Institute for Health and Social Care Research of the Welsh Government to develop and implement a sophisticated methodology for evaluating the benefits to health and well-being of allotment and community gardening for older adults. Methods: The project has used a 12-month action-research approach involving a systematic review, field visits, and meetings with key stakeholders at all stages to develop a robust research design involving quantitative and qualitative methods. Results: The design comprises a complex intervention study where new and existing allotment and community gardeners complete a range of health and well-being measures at baseline, 2 month, and 4 month follow-ups. Conclusion: At the time of the congress, data from the baseline and 2-month follow-ups will have been analysed and will be available for presentation, as well as some preliminary findings from the 4-month follow up measures. The results of the literature review and action-research process will also be discussed.
Wednesday 15th August 2012
Day Theme: Falls and Fractures/Balance and Bone Health

Plenary Keynotes

PREVENTING FALLS AND FRACTURES WITH PHYSICAL ACTIVITY AND EXERCISE
Skelton, Dawn A
School of Health and Life Sciences, Glasgow Caledonian University, UK.

Epidemiological evidence suggests that, compared with a sedentary lifestyle, over three hours targeted exercise each week can halve the risk of osteoporosis, falls-related injuries and hip fracture. People spending less than 4 hours a day on their feet also have a greater risk of osteoporosis. To maintain healthy bone mass, three 20-30 min sessions of weight-bearing exercise each week are recommended. To reduce falls, weight bearing balance exercise is also recommended, but with the caveat of a 50 hour dose. But we know some forms of exercise, in certain groups of older people, can actually increase the risk of a fall or fracture. Brisk walking, although has many endurance benefits, is often unsafe in those with poor balance and strength. There have been literally hundreds of studies that have looked at different types of exercise, different durations or intensities, different progressions and different frequencies per week. Do we have to exercise three times a week and are the effects better when we exercise in groups or alone? Once we are a faller or have osteoporosis, do the exercises change and does it matter who delivers them? How are we to make sense of the array of evidence and guidelines? Although this lecture cannot answer all of these, there will be some common-sense thoughts on research so far and where we can go in the future.

PROMOTING AND MARKETING PHYSICAL ACTIVITY TO OLDER PEOPLE
Milner, Colin
CEO, International Council on Active Aging, United States.

Most governments, healthcare systems and corporations remain ill prepared for population aging. Significant gaps exist in all areas that need to be filled—gaps that provide challenges and opportunities for society. One such gap is the health and well-being of older adults. One opportunity to fill these gaps is the promotion and marketing of physical activity to the older population. However, research shows that relatively few marketers focus on the older-adult demographic, and most of those who do get a failing grade. How can this change? By attending this forward-thinking session, you will journey into the mind of the older adult to learn about their core needs, and to better understand why current sales and marketing efforts fail to address them. In addition, you will learn how to transform your marketing
efforts to capture this group’s hearts and minds and learn more about what it takes to make your marketing relevant to their lifestyles, capabilities, needs, dreams, aspirations and expectations, while achieving a response.

Symposia

OCCUPATIONAL THERAPY AND FALLS: PROMOTING ACTIVE ENGAGEMENT WITH OLDER PEOPLE IN FALLS PREVENTION

Ballinger, Claire¹; Clemson, Lindy²; Robertson, Kate³; Brooks, Charlotte¹; Schwab, Petra⁴
¹University of Southampton, UK; ²University of Sydney, Australia; ³University of Derby, UK; ⁴Akademie für Ergotherapie Wien, Austria.

Elders’ falls are recognised internationally as a cause of significant morbidity and mortality. Good evidence exists for multifactorial interventions, and strength and balance exercises in the prevention of falls. However, environmental and behavioural factors in the prevention of falls have, until recently, been poorly understood. Falls prevention initiatives may also be compromised by poor uptake of and adherence to interventions. Occupational therapists are well placed to work together with older people to minimise their falls risk, and optimise confidence, function, health and wellbeing. Keywords: Morbidity and Mortality; Strength; Balance; Prevention of Falls.

Exploring visually impaired elders’ views about occupational therapy falls prevention interventions: How focus group findings will inform the VIP2UK trial

Ballinger C¹, Waterman H², Todd C², Skelton D³, Brundle C², Stanford P², McEvoy L²
¹University of Southampton UK; ²University of Manchester, UK; ³Glasgow Caledonian University, UK

Visual impairment is a risk factor for falls. The ‘VIP’ trial (Campbell et al 2005) evaluated the effectiveness of a home safety intervention and an exercise programme in preventing falls among older people with visual impairment. Although fewer participants randomised to the home safety arm of the trial experienced a fall, adherence to both interventions was sub-optimal. This paper reports on research exploring visually impaired elders’ views about falls prevention, with the aim of enhancing uptake and adherence within the VIP2UK trial. Four focus groups were held with older people and their carers, and two with health care professionals (HCPs). Individual interviews were carried out with nine people in their homes, and with an additional two HCPs. Barriers to uptake and adherence included potential stigma, lack of perceived risk, poor HCP education around visual impairment and inappropriate supporting written material. Enablers included careful and sensitive explanation, peer acceptability, demonstration and appropriate supporting material, individually tailored interventions and the involvement of carers. We will discuss the implications of these findings for the two occupational therapy interventions to be delivered in the VIP2UK trial (home safety and exercise), and also how the trial peer mentors might use this information. Reference: Campbell AJ, Robertson MC, La Grow SJ, Kerse NM, Sanderson GF, Jacobs RJ, Sharp DM, Hale LA (2005) Randomised controlled trial of prevention of falls in people aged ≥75 with severe visual impairment: the VIP trial British Medical Journal 331, 817-20.
The design, development and application of LiFE, the Lifestyle-integrated Functional Exercise program to reduce falls in older people

Clemson, Lindy.
Ageing, Work & Health Research Unit, The University of Sydney, Australia.

In the LiFE approach balance and strength activities are individually tailored for the older person and embedded within their daily routines. It involves changing everyday habits and draws on concepts of self-efficacy to prescribe and teach an individualised tailored program. A nationally funded randomized trial, led by Clemson, rigorously examined the efficacy of this novel approach to falls prevention. It was proven to significantly reduce falls and to have very positive and significant functional outcomes for older at-risk community residing older people. LiFE expands our knowledge about the role of functional balance and strength activities in falls prevention. It provides another exercise choice that can be taught by occupational therapists and physiotherapists. There are positive outcomes that can be marketed to potential participants: having enhanced energy to do more, improved function in doing activities and enhanced participation in daily life. LiFE has the potential to challenge and to expand our home visit focus working with older people to find opportunities to incorporate balance and strength training into daily life. The presentation will discuss the design, development and explore the application of the program to current practice. It will conclude with an outline of future research plans.

Thinking falls, taking action: Development of the Guide to Action for Falls Prevention Tools

Robertson, Kate.
County Health Partnerships, Nottinghamshire, UK.

Background: We developed a multiagency tool for use with community dwelling older people which highlights falls risk factors for the individual and suggests actions to take to reduce falls. This tool was then adapted for use within a care home setting. Methods: The Guide to Action for Falls Prevention Tools was developed through an iterative process by a team of clinicians, academics, older people and carers. Appraisal of evidence of risk factors for falling in older people and successful interventions to reduce falls was completed. The Tools were developed, trialled and embedded in clinical practice. Results: Audit of the community based tool showed it was easy to use, highlighted previously unrecognised falls risk factors but required clinicians to be trained in its use to be most effective. A study of the use of the Care Homes Tool showed it was quick and easy to use and acceptable to care home staff, increased understanding of falls risks and actions to reduce falls and that training in the tool’s use improved implementation within care home settings.

The readability of English language falls prevention websites aimed at the public

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Background: Low literacy levels are associated with poor health outcomes and increasing age (1,2). Older people are increasingly accessing the internet for health-related materials (3). Previous studies have explored the quality and representations of old age in falls prevention websites (4,5). However, no other literature has been identified assessing the readability of such websites. Objective: To evaluate the literacy levels of frequently accessed English

**Fall prevention—A matter of balance: Experiences of occupational therapists concerning fall prevention for community-dwelling elderly**

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**Background/Aim:** Given the aging population and falls as challenge to individuals and society, the area of working with community-dwelling elderly people will expand in the future. In consideration of the societal importance of falls and the lack of knowledge concerning the Austrian situation of occupational therapy fall-prevention, this study aims to explore how Austrian occupational therapists experience the current practice of fall-prevention intervention for community-dwelling elderly people. **Method:** For this study, a grounded theory approach was used. Focus group and single-in-depth interviews with in total seven occupational therapists from a major city in Austria were conducted. All participants had experience of 10 - 25 years working within the field of fall prevention with community-dwelling elderly. **Findings:** ‘Balancing autonomy and safety’ was found to be the core-category and OTs central concern in fall-prevention. To keep the balance between autonomy and safety ‘balancing responsibilities’ emerged to be the second major category accompanied by ‘managing various OT roles’, ‘affecting client’s habits and values’ and ‘balancing the roles of relatives’. **Conclusion:** Occupational therapists experienced fall-prevention as a highly challenging matter of balancing autonomy and safety. A client-centred approach is suggested to achieve successful fall-prevention which aims as much on client’s autonomy as on safety.

**IDENTIFYING AND ADDRESSING FEAR OF FALLING IN HIP FRACTURE PATIENTS: PRELIMINARY RESULTS OF A MULTIFACTORIAL INTERVENTION**

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Hip fractures are one of the most serious consequences of a fall and a high risk for becoming community immobile and functionally dependent. There is some evidence that fear of falling (FoF), self-efficacy and perceived control are important psychological variables in the recovery from hip fracture. In contrast to interventions for community-residing older people, there is little knowledge about sensitive screenings and cognitive behavioural interventions targeting such psychological variables during inpatient rehabilitation. Based on the Short Falls Efficacy Scale International (FES-I) a set with 16 icon cards including less demanding activities (e.g. transfer situations) was developed. Together with single questions on fall-related post-traumatic stress and fears of future falls the icon set are part of the FoF screening. This approach will be discussed in regard to the clinical judgment of physiotherapists, the patient’s experience of the injurious fall and psychological variables like anxiety control and psychological flexibility. Based on a theoretical framework a multifactorial intervention to improve physical activity and falls efficacy was developed. Six components (1. relaxation techniques, 2. mobility goals, 3. falls-related cognitions and emotions, critical situations, 4. individual physical exercise programme for home-based training of strength and balance plus functional floor exercises if feasible, 5. implementation of physical exercises and activities into daily life, 6. fall hazards) are delivered by physiotherapists in 8 face-to-face sessions during rehabilitation plus 4 telephone contacts and one home visit after discharge. The goals of the components, the impact of the psychological supervision, first results and patient examples of the ongoing randomized controlled trial will be presented. Keywords: Fear of Falling; Hip Fractures; Fall Risk; Multifactorial Intervention.

AGEUK FALLS AWARENESS WEEK

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1AgeUK, UK; 2 Avicenna, UK; 3 Central London Community Healthcare NHS Trust, UK.

Falls Awareness Week was originally set up in 2005 to provide a focus for local action and encourage organisations working with older people to organise events to raise awareness of the practical ways to reduce the risk of falls. This symposium will give an overview of the last eight years and present some of the highlights to demonstrate the impact of a coordinated local and national approach to raising awareness and reducing falls. It will include the following sessions with allocated time for questions at the end of the symposium. Introduction: A background to the campaign, including: Why do we do it?; Background to the issue of falls; Putting policy & research into practice: engaging with older people and delivering effective health promotion; What does it achieve?; Reach: media coverage, participants; Partnerships/ongoing programmes of work; How do we do it?; Using different themes: from pavements to vision. The following three ‘case studies’ will be presented as examples of FAW events and initiatives that can lead on to ongoing programmes of work and local partnerships. 1. The role of pharmacists in falls prevention (Zul Mamon, Avicenna). This session will focus on the pharmacy campaign run by Avicenna pharmacy group to enable their members to identify older people at risk from falls and ensure appropriate signposting for effective treatment and rehabilitation. During Falls Awareness Week 2010 Avicenna members were invited to take part in a specially devised training programme, encompassing osteoporotic treatments, medicines and combinations of medicines linked to falls, and put this to use with the Falls Risk Assessment Tool to reduce falls among individual older people. In addition to training and guidance for members, the group produced additional materials for use in
ongoing awareness raising, including leaflets and home safety checklists, as well as links to local community services, NHS falls prevention teams and voluntary sector services. Outcomes from one participating pharmacy included: 26 FRAT assessments conducted; 18 Medicine Use Reviews conducted; six patient referrals to optometrist; one patient referral to GP; postural hypotension found in three patients; eight patients recommended calcium and vitamin D supplements. 

2. The voluntary sector perspective. The session will include an example from an AgeUK event at this year’s Falls Awareness Week to highlight the issue of falls and bone health. 3. 'On the Buses': working with local bus companies. This session will highlight the work conducted by Central London Community Healthcare NHS Trust to raise awareness of the risks of falls on buses, including activities that were run on Falls awareness Day in 2009 to educate bus drivers and bus company managers about falls and their impact on older people, as well as those that were targeted towards older bus users. The session will also showcase the work done by CLCH, Help the Aged and First Group in producing safety information and materials for older passengers, including a Safe Journey card, and follow-up work with local councils and Transport for London to raise awareness among Freedom Pass holders, and introduce a component on falls within ongoing training for bus drivers. 

Keywords: Falls Awareness; Charity; Reduction of Risk of Falls; Training of Professionals.

ENHANCING PARTICIPATION IN EXERCISE INTERVENTIONS FOR THE PREVENTION OF FALLS

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1Bournemouth University, UK; 2The George Institute, Australia; 3University of Otago, New Zealand; 4California State University, United States.

Falls are recognised around the world as a major cause of morbidity and mortality among older people. Exercise interventions are proven to prevent falls, yet sedentary activity is prevalent among older people. The aim of this symposium is to stimulate discussion of the potential factors that might enhance participation among older people.

Current evidence on older people’s participation in exercise interventions for the prevention of falls

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Rationale: Low uptake and adherence from participants can threaten the effectiveness of interventions, but little is known about the issue in regard to falls prevention. Therefore, we conducted a review to collate the evidence on older people’s participation and engagement in falls prevention trials with an emphasis on exercise interventions. Method: A recent authoritative Cochrane systematic review evaluated interventions to prevent falls among older people in the community (Gillespie et al., 2009). We supplemented this review by re-analysing the single and multi-factorial randomised controlled trials (RCTs) (n = 99) on four outcome variables: 1) recruitment into the RCT, 2) attrition from the RCT at 12 months, 3) adherence to the intervention, and 4) any tests for whether adherence moderated the effect of the intervention on falls. Descriptive statistics were conducted using medians, ranges, and interquartile ranges. Results: The average recruitment rate into the RCTs was high (median = 70.7%, range 64.2–81.7%), and the average attrition rate at 12 months (excluding mortality) was low (median = 9.3%, range = 7.5–10.8%). Exercise interventions
had the lowest recruitment rate (64.2%), but a very low attrition rate at 12 months (median = 8.0%). Adherence rates were ~80% for vitamin D/calcium supplementation; ~70% for walking and class-based exercise; 52% for individually targeted exercise; approximately 60–70% for fluid/nutrition therapy and interventions to increase knowledge; 58–59% for home modifications; but there was no improvement for medication review/withdrawal of certain drugs. Adherence to multifactorial interventions was generally ~75% but ranged 28–95% for individual components. Moderator analyses were tested in 13 studies that had mixed results, with five exercise interventions reporting non-significant moderator effects of adherence on trial outcomes.

**Conclusion:** Using median rates for recruitment (64%), attrition (10%), and adherence (52–70%), we estimate that, at 12 months, on average 30–40% of community-dwelling older people are likely to be adhering to exercise interventions for the prevention of falls.

**Predictors of exercise adherence among community-dwelling older people**

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**Background:** It is widely acknowledged that physical activity has wide-ranging benefits for the health and well-being of people of all ages. In older people in particular, there is clear evidence that structured exercise can prevent falls (Gillespie, et al. 2009). However, a major limitation of physical activity and exercise as a public health intervention is low rates of participation. **Objective:** This study aimed to identify physiological, psychological, health and lifestyle factors associated with poor exercise adherence in retirement village residents.

**Methods:** The study involved 344 people, aged 62 years and over who participated in a falls-prevention exercise program in Sydney, Australia. 163 low adherers (those who attended less than 30% of exercise classes over a six-month period) were compared to the rest of the sample.

**Results:** Several baseline measures of balance, cognition, walking speed and health and mobility were impaired in the low adherers compared to the rest of the sample. Logistic regression analysis identified three variables: postural instability (OR = 1.83, 95% CI 1.17-2.87), taking four or more medications (OR = 1.75, 95% CI 1.12-2.73) and poor Mini Mental State Examination (MMSE) score (OR = 1.79, 95% CI 1.14-2.80), as significant, independent predictors of poor adherence. The area under the curve (AUC) for this model was 0.64 (95% CI 0.58 to 0.70), bootstrap-corrected AUC = 0.64. **Conclusion:** Logistic regression modelling identified postural instability, polypharmacy and poor cognition as the most significant independent predictors of poor exercise adherence. These findings may assist in the development of pre-exercise screening techniques that could be used in public health programs. **References:** Gillespie LD, Robertson MC, et al. 2009. Interventions for preventing falls in older people living in the community. Cochrane Database of Systematic Reviews: Issue 2. Art. No.: CD007146. DOI: 10.1002/14651858.CD007146.pub2.

**Barriers to Otago exercise participation among older people with visual impairment**

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Fall prevention exercise programmes need to be maintained for continued effectiveness and this may be more difficult than usual for those with disability. In a trial of an exercise programme, proven to reduce falls when used in older people with normal sight, we found no significant reduction in falls in those with severe visual impairment in the intention to
treat analysis. There are a number of possible reasons for this but lack of adherence to the programme contributed. Those who carried out the exercise programme regularly had a significant reduction in falls compared with those who did not exercise regularly. Those with severe visual impairment may not consider that they are able to take regular exercise and may be especially concerned about the safety of any programme. Modifications may need to be made to a programme proven to be of value in those with normal sight. For example, if an outside walking schedule is part of a programme it may not be safe and need to be modified or omitted. The information about the programme and instructions for each exercise may need to be given by audiotape. All illustrations need to be simple, and clearer than usual. The instructor overseeing the person’s programme should look for a suitable and safe place within the home for the person to carry out the exercises. Initial participation in groups may increase confidence. Involvement of special organisations such as the Royal Foundation of the Blind may help with the establishment of groups and provide assistance and encouragement to continue the programme at home. Families also can be very helpful in providing initial support and reinforcing the need for continuation. Intercurrent illness or injury is a common reason for stopping participation in any exercise programme for older people. People with impaired sight are at greater risk of falls and injury and processes need to be in place to reassess and restart the programme when it has been discontinued for a period for health reasons.

Maximising uptake and adherence when implementing an exercise intervention to prevent falls

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The development of a broad continuum of fall risk reduction programs that address the needs of older adults at different levels of fall risk are becoming increasingly important as the older adult segment of the population worldwide continues to rapidly expand. Multi-component exercise interventions have been particularly effective in lowering fall risk and/or fall incidence rates in the short-term (Gillespie et al., 2009). When designing these types of interventions, however, it is important to consider the factors that influence client uptake and adherence, both during and after the acute phase of the program ends. To date, very little fall-risk-reduction research has systematically included any strategies designed to effect long-term changes in behaviour and compliance with recommended fall prevention activities. Recommended strategies for increasing uptake include matching the needs, preferences, and capabilities of the older adult to the intervention, promoting the specific benefits of an intervention relative to improving balance and reducing fall risk, and fostering self-management skills by having the participant take an active versus passive role in the intervention process. Ascertaining the behavioural readiness of potential enrollees is also central to facilitating uptake. Patient activation and/or profiling tools have been successfully used in health behaviour research to better match clients to a particular intervention. Systematically including strategies aimed at changing attitudes and actual behaviours that contribute to heightened fall risk are important for achieving long-term engagement in physical activity and other supportive fall-risk-reduction behaviours (e.g., modifying the home and immediate environment for added safety, getting regular vision and hearing check-ups, eliminating risky behaviours). Finally, designing a step-down approach aimed at fostering the older adults self-direction and management of risk following the acute phase of the intervention has also been shown to foster long-term adherence. Examples of effec-
Attitudes and beliefs associated with uptake and maintenance of physical activity among South Asian older adults aged 60–70

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Background: Sedentary behaviour among South Asian (SA) older adults is common, with only 11% of SA men and 8% of SA women aged 55 years and over in the UK meeting the recommended levels for physical activity (PA) (Sproston & Mindell 2006). At the same time, these individuals experience greater levels of heart disease, stroke, and type-2 diabetes; conditions that can be prevented or improved through regular participation in PA (Gill et al., 2007). This presentation reports on research undertaken to identify attitudes and beliefs associated with the uptake and maintenance of PA among SA older adults aged 60-70 to inform our understanding of how PA programmes could be designed and presented to motivate SA older adults to take up and adhere to a regular PA programme. Method: An exploratory qualitative approach was utilized using five focus groups (n = 29) and 17 in-depth interviews were conducted to explore the motivational factors associated with initiating and maintaining PA among SA older adults. Data analysis followed the framework approach. Findings: Health, maintaining independence, and social support were important in terms of initiating PA activity, whereas social support, psychosocial elements of activity, health and integrating physical activity within everyday activities were important for adherence. Gendered physical activity sessions were important to initiating exercise among Muslim South Asian 60-70 year-olds. Conclusions: Building PA in and around day-to-day activities and promoting active lifestyles are important strategies to increasing activity levels. Culturally appropriate facilities and peer mentors, who could assist those with language barriers, specific tailored advice and general social support, could promote uptake and subsequent adherence among this population group.

Living Independently for Elders: Increasing physical activity for nursing home eligible urban African Americans

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**Background:** Living Independently for Elders (LIFE) at the University of Pennsylvania (UPenn) is an academic nurse run community based long-term care practice. The focus of this interdisciplinary practice is to prevent institutionalization in community dwelling frail older adults who qualify for nursing home placement. This practice serves dual eligible older adults who are covered by Medicaid (State) and Medicare (Federal) insurance. LIFE UPenn is both the members’ provider and insurer. **Project:** The LIFE UPenn program currently has 430 members age 55+, 95% of whom are African American with 5 or more chronic illnesses. Urban African American typically have low vitamin D levels which impacts not only their bones but their mobility (Wilkins et al. 2009). This population is already frail, predisposing them to increased vulnerability, poorer health outcomes, institutionalization and death (Lang et al. 2009). Engaging this population in PA is essential in maintaining them in the community (Duru et al. 2010). The LIFE UPenn day center provides an interdisciplinary setting to engage the members in physical activities (Sullivan-Marx et al., 2010). Members of LIFE UPenn are assigned to Nurse Practitioner led teams. Each team consists of a physical, occupational and recreational therapist, primary nurse, physician, social worker and a consulting nurse practitioner who focuses on mental health of the members. The team focuses is on keeping members well enough to live in the community which includes keeping them physically active. **Discussion:** This presentation will describe the successful interdisciplinary programs used to facilitate increased physical activity and discuss the techniques used to motivate and increase engagement and adherence to physical activity programs e.g. Vitamin D repletion, structured walking programs, fall reduction program and innovative recreational therapy including Tai Chi, line dancing and movement therapy. Successful techniques to increase engagement and adherence to PA programs will also be described, such as identifying and training African American caregiver staff to champion activity and motivate members to participate and receiving guidance from the Council of Elders to identify culturally appropriate PA programs for the Members (Sullivan-Marx et al. 2011). **References:** Duru, C.K., Sarkisian, C.A., Leng, M., Mangione, C.M. (2010). Sisters in motion: A randomized controlled trial of a faith-based physical activity intervention. Journal of the American Geriatrics Society, 58, 1863-1869; Sullivan-Marx, EM, Bradway, C., Barnsteiner, J. (2010). Innovative collaboration: A case study for academic owned nursing practice. Journal of Nursing Scholarship. 42(1), 50-57; Sullivan-Marx, EM, Mangione, KK, Ackerson, T., Sidorove, I., Matlin, G.G., Volpe, S., Craik, R. (2011); Recruitment and retention strategies among older African American women enrolled in an exercise study at a PACE program. Gerontologist, 51, Suppl. 1:S73-81.

Active ageing and fall prevention among older Chinese people

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Background: To promote active ageing cultural awareness is needed since culture influences how people understand and interpret their experiences and how they respond to active ageing (Horton & Dickinson, 2011). Ethnicity and culture may affect attitudes towards and participation in exercise and fall prevention strategies although there is little understanding of this influence (Horton & Dickinson, 2011; Horne et al., 2009). This presentation aims to report on research undertaken to explore the perceptions of older Chinese people in relation to falls and fear of falling, and the barriers and facilitators identified to taking up fall prevention interventions (Horton & Dickinson, 2011). Method: Grounded Theory approach with a purposive sample of 30 Chinese older people (9 men and 21 women) who attended Tai Chi classes, two focus groups with ten people in each and ten face-to-face in-depth interviews were conducted in Mandarin or Cantonese. Interview transcripts, back translated were analysed using constant comparative analysis. Findings: A range of health-seeking behaviours were identified following a fall. Chinese culture, rooted in the beliefs and practices of the Chinese philosophical assumptions about health, illness and healing, and their acquired ways of coping with the experience of falls influenced Chinese older people’s decisions to taking up fall prevention interventions. Although the family is still regarded as the cornerstone of their society they remain fairly conservative in clinging to the ‘social’ aspect traditional Chinese society as cultural intergenerational relations had an impact on taking actions to prevent falls and whether or not to take up Tai Chi as a ‘Chinese’ option. Conclusion: Cultural diversity affects Chinese older adults’ acceptance of fall prevention interventions. References: Horne, M., Speed S., Skelton D. & Todd C. (2009). What do community dwelling Caucasian and South Asian 60-70 year olds think about exercise for fall prevention? Age and Ageing, 38 (1): 68-73; Horton, K. & Dickinson, A. (2011). The Role of Culture and Diversity in the Prevention of Falls among Older Chinese People. Canadian Journal of Ageing, 30; 1: 57-66.

FALLS, FALL PREVENTION AND PHYSICAL ACTIVITY IN OLDER PEOPLE WITH INTELLECTUAL DISABILITIES

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People with intellectual disabilities have different patterns of health when compared with the general population, and can experience health inequalities. They have higher rates of mortality compared to the general population, although life expectancy is increasing (1). As longevity increases for people with intellectual disabilities, promoting healthy and active ageing becomes even more important. Falls are a recognised problem for people with intellectual disabilities. Previous research has demonstrated that adults with intellectual disabilities experience high rates of falls, which are similar to those of older adults in the general population (2, 3), but they are experiencing falls at a younger age3. Despite this however, there has been little or no investment to date, in developing falls assessment or prevention strategies for people with intellectual disabilities. The purpose of this symposium is to present an overview of falls experienced by people with intellectual disabilities, including risk factors identified for falls, with a view to drawing on the expertise and good practice guidelines of researchers working with older adults to prevent falls; to develop falls assessment and falls prevention strategies which are tailored for people with intellectual disabilities. Physical activity and exercise interventions will be presented and considered in relation to this topic, as part of healthy and active ageing (4, 5). References: 1. Emerson et al. (2012) Health Inequalities &

Preventing falls and promoting physical activity in people with intellectual disabilities

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**Background:** People with intellectual disabilities (IDs) have different patterns of health and experience some health problems more commonly when compared with the general population. Previous research has demonstrated that adults with IDs high rates of falls, which are similar to those of older adults in the general population, but they are experiencing falls at a younger age. In addition, previous research has also demonstrated that adults with IDs are more likely to have low patterns of regular physical activity (PA), that are similar to those found in sedentary adults who do not have intellectual disabilities in the general population. **Aim:** The aim of this research was to investigate the incidence of falls in a population and community-based cohort of adults with IDs, and to identify risk factors for i) falls/fall injury, and ii) low levels of PA. **Participants and Methods:** Interviews were conducted with 511 adults with IDs and their carers who live in Glasgow, UK at time 1 (baseline), and at time 2 (two-year follow up). Self/proxy-reported data was collected on falls/fall injuries experienced over the previous 12 months, and PA undertaken in a typical week. **Results:** 40.1% (205) adults experienced at least one fall in the previous 12 months, and incident injury due to falls was 12.1% (62). Independently predictive risk factors for incident fall injury were epilepsy (epilepsy-related included), and urinary incontinence and not having Down syndrome (epilepsy-related excluded). Only 150 (34.6% of 433) undertook any regular physical activity of at least moderate intensity. Older age, having immobility, epilepsy, no daytime opportunities, living in congregate care and faecal incontinence were independently predictive of low levels of PA. **Conclusion:** Adults with IDs require tailored strategies and interventions for preventing falls and promoting PA. As longevity increases for adults with IDs, promoting healthy and active ageing becomes increasingly important. **Keywords:** Falls Prevention; Physical Activity; Risk Factors; Healthy Active Ageing.

Physical exercises to improve strength, balance and coordination in older adults with intellectual disabilities

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**Background:** Older adults with intellectual disability (ID) are often physically inactive and frequently show signs of ‘premature aging’, with a greater tendency towards de-conditioning and morbidity. The causal influences and possible barriers to participation in physical exercises (PE) may be related to lack of PE appreciation on one hand, and on the other hand lack of caregiver support and difficulty finding experienced personnel to train them. There
is a strong correlation between low muscle strength, poor balance and physical inability in activities of daily living and well-being. The aim of the study was to investigate the effect of PE on balance, coordination, strength, and general well-being in adult people with ID.

Participants & Methods: The target population comprised of persons with ID who were the permanent care center resident, and aged 50 or older. Mobility and balance tests were measured by a Timed Get-up and Go test and Beam forward walking, and Posture Scale Analyzer system used to examine postural stability; Seven sensory-motor tasks included elements of hand-eye coordination; Knee muscles strength were measured on a Biodex dynamometer; The self-concept of well-being was measured by direct interview with a questionnaire consisting of 37 structural statements. Intervention: PE program was conducted four times a week for six consecutive months: twice a week treadmill walking or biking, and twice a week general exercises including ball games and dancing. Results: Six months of PE significantly improved balance, coordination, muscle strength, and well-being among older adults with ID.

Fall prevention in people with intellectual disability: Pilot risk assessment study
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Introduction: In people with intellectual disabilities (ID) falls are a threat for the functional status and quality of live. Compared to older persons the consequences are similarly multifactorial. As some research has indicated [1], there can be more injuries, higher costs for the health system, reduced physical activity, additional workload for staff members and increased fear of falling. But in depth information regarding the number and frequency of falls are rare. This is in contrast to the scientific expertise on falls in older people, living in a nursing home or independently at home. In addition information on fall risk factors, possible assessment tools for risk factors, and designs as well as effects of a multifactorial intervention for fall prevention is lacking. Because of this deficit, our study is focused on obtaining and defining risk factors in people with ID. Furthermore information on the circumstances and consequences of a fall are gathered. In addition the study analyses the adaptability and reliability of approved assessment tools in persons with ID to screen for risk of falling.

Assessment Tools: The Timed „Up and Go” Test, Chair-Stand and Romberg-Balance-Test are very well known for assessing fall risk in older people in the general population. These tests have already been used to measure strength, balance and complex movement in people with intellectual disability. But little is known about the feasibility of these assessment-tools in the ID-population or even the reliability and interrater-reliability. In a pilot-study, we focus on the adaptability and reliability of these approved assessment tools. Setting and Sample: Study will take place in a special residential institution for people with ID. More than 200 residents are living there, with different grades of ID, and support needed. Two-thirds are female and the mean age is 54.11 years.

Development of a physical activity based intervention (PrefallID)
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In people with intellectual disabilities (ID) falls are a threat for the functional status and quality of life. Compared to older persons the consequences are similarly multi-factorial. In contrast to fall prevention research in community-dwelling older persons or in nursing homes settings, knowledge and evidence for appropriate interventions are rare and missing. In a recent review on balance and gait capacities in persons with ID, it has been demonstrated that due to delayed balance and gait capacities in the developmental process persons with ID start on a lower functional balance and gait level. But these are the limiting factors – among others – for mobility and fall risk, and therefore it seems mandatory to address both, balance and gait, in a physical activity based intervention. In addition, this approach is in line with evidence of exercise intervention in community-dwelling older persons. Some research has already been done to investigate the trainability of both balance and gait in persons with ID but the evidence is weak. Due to the multifactorial nature of falls in persons with ID, physical activity based intervention have to target other domains as well. This approach is nested in the model of the ICF, and taking into account the personal factors e.g. motivation for physical activity also in account as environmental factors (accessibility of gymnastic rooms). The presentation will outline first planning and structuring a physical activity based exercise program in persons aged 18 and older with ID.

THE PROACT65+ EXERCISE TRIAL SYMPOSIUM: AN OVERVIEW, PRACTICAL IMPLICATIONS AND LESSONS LEARNED

Iliffe, Steve1; Haworth, Deborah1; Stevens, Zoe1; Barlow, Cate1; Gawler, Sheena1; Pearl, Mirilee1; Belcher, Carolyn1; Gage, Heather2; Carpenter, Hannah3; Kendrick, Denise3; Dinan-Young, Susie1; Bowling, Ann4; Masud, Tahir5; Skelton, Dawn A6

1Royal Free and University College Medical School, UK; 2University of Surrey, UK; 3The University of Nottingham, UK; 4Southampton University; 5Nottingham University Hospitals NHS Trust, UK; 6Glasgow Caledonian University, UK.

Background: The ProAct65+ Trial is a multi-centre cluster randomised controlled trial comparing two exercise interventions, the Otago home based exercise programme (OEP), and, the Falls Management Exercise (FaME) programme, with a control group, in patients aged 65 and over in primary care. The study has recruited a total of 1256 participants through GP practices in London and Nottingham/Derby. Aims: To give an overview of the ProAct65+ Trial and how it has worked in practice and the lessons that have been learned from conducting the research and how these may be applied to its practical implication in “the real world.” Method: After a brief overview of the study, the symposium will be divided into four presentations and conclude with a group discussion. 1: The Interventions: a discussion of the home and community based exercise programmes, how these have worked in practice, the challenges that have been faced and the quality assurance techniques that have been utilised. 2: Participant Recruitment and characterisation: how do we get GPs and participants to join an exercise promotion trial run through general practice and what are the people like who do join? 3: Money Matters: what financial costs are associated with running a trial like this and how does this relate to the “real world”? 4: Safety Issues: how have we ensured that people who have participated in the trial have stayed safe and how have we dealt with any safety issues or concerns that we have come across.
Recording adverse events for a complex intervention such as exercise in older people: How can we achieve consistency?

Belcher, Carolyn on behalf of the ProAct65+ team

*Introduction:* An adverse event (AE) is any unfavourable and unintended sign, symptom, syndrome or illness that develops or worsens during a period of observation in a trial. Adverse events were recorded from participants taking part the ProAct65+ trial. This was especially important since exercise within this age group may be associated with an increased risk of AEs, particularly falls. All AEs were assessed for seriousness and causality. If a non-serious AE was judged to be possibly, probably or definitely related to the trial, this was recorded as an Adverse Reaction. A system of comparing results, for improved consistency, between the two participating centres was developed and modified. *Methods:* AEs were recorded in a several ways. Participants were questioned about possible AEs at follow-up appointments through falls and health-service-utilization diaries throughout the trial; and during telephone physical activity questionnaires. If insufficient information was included in diaries a researcher collected those details by telephone. As a measure of consistency, blinded AE forms were exchanged between the two centres and graded. Mismatches between sites were identified, and blinded forms then passed to the principal investigators who agreed a final category. *Results:* An initial comparison of 269 AEs showed a mismatch of 19% with the category of “possibly related” being open to subjective interpretation. As a result of these findings, a category of Possible Adverse Reaction was introduced. The mismatch rate in subsequent comparisons went down to less than 6%. *Conclusion:* Researchers on complex intervention trials need to set up a well-defined system of AE reporting which allows for consistency checking. Results from early comparisons can be used to modify categories if necessary.

Working with volunteer peer mentors and paid professional exercise instructors in a trial of exercise interventions

Stevens, Zoe & Pearl, Mirilee on behalf of the ProAct65+ team

*Introduction:* ProAct65+ tests whether a home-based (OEP) or group-based (FaME) exercise intervention promotes a long-term change in exercise behaviour. This presentation will discuss the use of health promoters in each exercise intervention; Postural Stability Instructors (PSI) in the FaME arm and Peer Mentors (PM) in the OEP arm, and describe the PMs experiences. *Methods:* Specialist PSIs were recruited through Later Life Training, or trained specifically for the trial, and employed by ProAct65+. Regular quality assurance visits reviewed performance against specific criteria and provided individual feedback to the PSI. PMs were recruited locally through exercise classes, email and newspaper advertisements on a voluntary basis. They were trained in OEP as Peer Mentors and attended quality assurance events regularly during the intervention period. Ten PMs were interviewed about their experiences on the trial and data was analysed using Thematic Content Analysis. *Results:* Despite quality assurance visits to standardise delivery, PSIs efforts to test and extend participants’ skill level varied considerably. They were also less consistent than PMs in completing research documentation (attendance diaries, participant achievements etc). Recruiting PMs was difficult with significant regional variations between sites. PMs found home visits more useful than telephone contact to assist with exercise promotion, but barriers included difficulty making contact and locality issues. As lay volunteers, PMs’ exercise promoting activity varied considerably as did their motivational expertise. PMs indicated they enjoyed meeting OEP participants and watching them progress throughout the intervention. *Conclusions:* It can be easier to recruit PSIs than volunteer peer mentors by training exist-
ing exercise instructors and PSIs are better equipped to deliver a standardised intervention. PSIs however, appear less focused on the research aspects of the intervention. ProAct65+ PMs experiences are consistent with other research on peer mentors. It is important that face-to-face contact is included in any PM intervention involving exercise.

**ProAct65+: Resource implications of ProAct65+ exercise interventions for the NHS**

Gage Heather & Jackson, Daniel on behalf of the ProAct65+ team

**Introduction:** ProAct65+ is investigating the health benefits of two existing exercise interventions, delivered over 24 weeks, to people aged 65+, in two sites (London, and Nottinghamshire/Derbyshire), compared with usual care (no specific exercise intervention). An economic evaluation is being conducted alongside the clinical trial. This paper reports the relative costs of delivering the interventions within the NHS. **Methods:** A ‘top-down’ approach was used to capture the resource implications for the NHS of delivering the interventions. FaME (Falls Management Exercise) is a community-centre based group programme delivered by Postural Stability Instructors (PSIs). OEP (Otago Exercise Programme) is a home-based exercise and walking plan comprising a professional-led induction and assessment meeting, followed by trained peer mentor support through home visits and telephone calls. Data were collected prospectively from PSIs and peer mentors (using specially designed logbooks) and from study records. Resource use will be converted into costs; total and average (per participant). Costs incurred by the NHS to deliver the interventions will be compared between FaME and OEP. **Results:** Four categories of resources were involved: SET UP: appointment of PSIs, peer mentors and training of mentors; FACILITIES: Hire of halls (24 sessions per group for PSI) and hire of halls for induction meetings; EQUIPMENT: Therabands, mats and instruction booklets for PSI and ankle cuff weights and booklets for OEP; HUMAN RESOURCES: remuneration and travel cost for PSIs and travel and phone call reimbursement for mentors. **Conclusion:** Intervention costs incurred by the NHS are only one element of overall costs. Others include: private / participant out-of-pocket expenses (e.g. travel to exercise classes, purchase of exercise clothing); costs of treating any new exercise-related injuries. Costs may be offset if exercise improves health and thereby reduces other service utilisation. Overall costs will be combined with measures of effectiveness to indicate the relative value-for-money of the interventions.

**How do we recruit participants to an exercise promotion trial run through general practice and who joins? The experience of the ProAct65+ trial**

Carpenter, Hannah & Haworth, Deborah on behalf of the ProAct65+ team

**Introduction:** The ProAct65+ exercise trial has recruited 1256 participants, aged 65 and over in Nottinghamshire, Derbyshire and London. Participants were recruited through their GP practice and various barriers to recruitment were encountered. This presentation will describe this process and the type of people recruited to the study. **Methods:** General practices were recruited to the study through local Primary Care Research Networks. GP practices excluded unsuitable patients and posted an invitation pack to randomly selected eligible patients. Participants were recruited from 43 practices in the study areas. Baseline data collected included: age, sex, ethnicity, educational attainment, number of long-term conditions and repeat medications. Data were also collected on socioeconomic group, income and current level of physical activity. Participant characteristic data were compared with data from The Active People Survey 5 from Sport England. **Results:** The trial invited 20507 patients to participate. After a higher than expected response rate, the conversion rate from
'expression of interest’ to ‘recruited’ was lower than anticipated. The mail-out size at each GP practice was increased from 450 to 600 to account for this. Of the 1530 patients booked in for assessment, 1256 were consented. Small list sizes at some GP practices meant that additional GP practices had to be recruited. The average age of participants was 73 with 84% of participants younger than 80. 62% of participants were female. 34 languages were spoken and 14% of participants were non-white. 43% of participants had completed some form of further education. On average, each individual had 2 co-morbidities and were on 4 medications. Conclusion: The ProAct65+ trial successfully reached its recruitment target due to a number of strategies, including adapting its methods when faced with barriers to recruitment. Participants in this trial are more likely to be female and under the age of 80. Compared to The Active People Survey participants, ProAct65+ participants were more educated, had a higher income and were more ethnically diverse.

SUSTAINABLE COMMUNITY-BASED FALLS PREVENTION: THE EXPERIENCE OF STEPPING ON

Clemson, Lindy

University of Sydney, Australia.

Falls are common with injury costs far exceeding motor vehicle accidents, and the consequences can result in institutionalisation. For many people there are resultant quality of life issues with a third reporting they curtail usual activities. Reducing risk of falls, enabling people with the right tools as well as a sense of control will keep people safe, active and connected with their community. However, the challenge is to implement and sustain evidence-based programs. Stepping On, a community-based falls prevention program based on adult learning principals, self efficacy and a decision making framework, was found to reduce falls by 31% (P = .025)) and is being widely implemented in the US and Australia. A Delphi review by experts and qualitative findings of interviews with program leaders and participants from several projects provides an understanding of the underlying concepts and how these translate for older people to enable them to apply preventive techniques and enhance their sense of control. Drawing on research from Australia and the US, this presentation will explore some of the experiences in the development of Stepping On and the models of service delivery used to give a wider reach and support sustainability of the program. Keywords: Falls; Prevention; Quality of Life; Wellbeing.

AGILE: CHARTERED PHYSIOTHERAPISTS WORKING WITH OLDER PEOPLE SYMPOSIUM

Thomas, Janet1, Townley Bex2; Rochester, Lynn3

1Queen Margaret Hospital, UK; 2Carmarthenshire County Council, UK; 3Institute for Ageing and Health, Newcastle University, UK.

The AGILE Symposium aims to focus on specific factors related to falling that are of interest to both Physiotherapists working in this area, and other Allied Health Professionals. Both sessions will have a strong practical element with take home messages that can be directly applied to practice. Firstly, Professor Rochester will examine gait, and the motor and non-motor characteristics of gait. She will focus on the requirements for successful mobility, especially in a community setting and the features of gait that predict functional decline and reduced mobility. Secondly, Bex Townley will take us through the exercise continuum,
with a particular focus on integrating service and how safe and effective exercise formats can be achieved for frailer older people at risk of falls.

**Exercise formats for strength and balance programmes in the falls prevention exercise continuum: The Carmarthenshire model: An integrated approach to delivering evidence based exercise programmes**

Townley, Bex

*Carmarthenshire County Council, UK.*

Maintaining and extending rehabilitation gains made within physiotherapy exercise sessions is a key aim of exercise professionals working in leisure/community settings. Physiotherapy exercise interventions within hospital settings work either on a one to one basis or small group numbers and operate at fixed term programme durations enabling ease of baseline, mid-point and end point assessment. They also focus on outcomes for the primary clinical pathology (i.e. cardiac rehab, pulmonary rehab, stroke rehab, and falls). This presentation focuses on the challenges faced by specialist exercise-referral services receiving referrals from multiple exercise pathways/ physiotherapy teams for patients presenting with multiply pathologies. The session will provide an overview of Carmarthenshire’s integrated approach to evidence based exercise programmes within a falls-prevention exercise continuum service and its strong links with primary and secondary prevention teams. It will provide practical examples of how safe and effective exercise formats can be achieved for frailer older people at risk of falls.

**Gait, mobility and falls**

Rochester, Lynn

*Institute for Ageing and Health, Newcastle University, UK.*

Increasing life expectancy challenges us to age successfully in order to remain safe and independently mobile. A life free from risk of falls and their negative consequences includes retaining the ability to mobilise independently at home and in the community. This requires a higher level of motor control as well as cognitive flexibility to address necessary motor skills whilst attending to a range of environmental stimuli and concurrent tasks. Gait is a complex motor function requiring input from multiple motor and non-motor domains in the central nervous system. In particular, recognition of the important role of non-motor characteristics such as cognitive and executive function to gait in older adults has influenced our understanding of complex gait performance. Important insights into the role of cognition have also been gained using dual-task paradigms which address automatic control of gait. Selected characteristics of gait are predictive of falls risk, mobility impairment and cognitive decline whilst cognitive decline in older adults predicts falls and loss of mobility. Impaired dual-task performance highlights potential difficulties faced in more challenging environments or during multiple task performance with subsequent increased risk of postural instability and falls. This presentation prioritises the requirements for successful mobility rather than falls prevention presuming that these skills will be protective against falls risk. The presentation will address: control of gait, including ambulation in complex environments such as the community; features of gait that are predictive of functional decline and reduced mobility; and strategies to address these.
A NEW APPROACH FOR PERSONALIZED FALL RISK PREDICTION & PREVENTION: TAILORED EXERCISES, UNOBTRUSIVE SENSING & ADVANCED REASONING

Wieching, Rainer¹; Kaartinen, Nico²; DeRosario, Helios³; Baldus, Heribert⁴; Eichberg, Sabine⁵; Drobics, Mario⁶; Delbaere, Kim⁷

¹University of Siegen, Germany; ²Kaasa Solution GmbH, Germany; ³Instituto Biomechanica de Valencia, Spain; ⁴Philips Research Europe, Netherlands; ⁵German Sports University, Germany; ⁶Austrian Institute of Technology, Austria; ⁷Neuroscience Research Australia, Australia.

In our ageing society, falls and their consequences cause tremendous problems as related to fractures, quality of life and health care costs. Due to the ongoing changes in the age structure of the population, this problem with all its consequences will further increase in the near future and innovative solutions to avoid falls in community dwelling older adults are urgently needed. The aim of iStoppFalls is to develop and implement ICT-based technologies which can be easily integrated in daily life practices of older people living at home, and which allow for continuous exercise training, reliable fall risk assessment, and appropriate feedback mechanisms, based on discreet measuring technologies and adaptive assistance functions. The Senior Mobility Monitor (SMM) as a component of the iStoppFalls system will unobtrusively and continuously monitor mobility in daily life. It will evaluate quantitative information on frequency, duration and type of mobility activities and qualitative information on balance function and muscle power. On the other hand, our Kinect based fall preventive exercise training game (Exergame) will facilitate real preventive exercise training at home (3 times a week), where data is acquired by unobtrusive sensing together with biomechanical modeling and optional heart rate data assessment. Our Knowledge Based System for Fall Prediction & Prevention correlates these two types of mobility analysis information (SMM & Exergame), and in turn provides sufficient data to perform a trend analysis of these entities, thus evidencing valid fall prediction & sustainable fall prevention in terms of tailored home based exercises for community-dwelling older adults. Our iTV component and the whole iStoppFalls system will be based on user-centered design and living-lab approaches, and thus provides advanced HCl adjusted to the capabilities of our elderly users (usability & accessibility). Keywords: Fall Risk Prediction; Balance Function; Technology; Fractures; Quality of Life.

Introduction to the iSTOPPFALLS project

Wieching, Rainer; Wulf, Volker

University Siegen, Germany.

In our ageing society, falls and their consequences cause tremendous problems as related to fractures, quality of life and health care costs. Due to the ongoing changes in the age structure of the population, this problem with all its consequences will further increase in the near future and innovative and cost effective solutions to avoid falls in community-dwelling older adults are urgently needed. Hereby active prevention plays an important role, especially in terms of fall-specific exercises and training programs. Modern information and communication technologies (ICT) in the field of home-based sensor technology, telemedicine and video games can support appropriate activities excellently as they are motivating and increasingly used by older people living at home. The aim of iStoppFalls is to develop and implement ICT-based technologies which can be easily integrated in daily life practices.
of older people living at home, and which allow for continuous exercise training, reliable fall risk assessment, and appropriate feedback mechanisms, based on discreet measuring technologies and adaptive assistance functions. The Senior Mobility Monitor (SMM) as a component of the iStopFalls system will unobtrusively and continuously monitor mobility in daily life. It will evaluate quantitative information on frequency, duration and type of mobility activities and qualitative information on balance function and muscle power. On the other hand, our Kinect based fall preventive exercise training game (Exergame) will facilitate real preventive exercise training at home (3 times a week), where data is acquired by unobtrusive sensing together with biomechanical modelling and optional heart rate data assessment. Our Knowledge Based System for Fall Prediction & Prevention correlates these two types of mobility analysis information (SMM & Exergame), and in turn provides sufficient data to perform a trend analysis of these entities, thus evidencing valid fall prediction & sustainable fall prevention in terms of tailored home based exercises for community-dwelling older adults. Our iTV component and the whole iStopFalls system will be based on user-centered design and living-lab approaches, and thus provides advanced HCI adjusted to the capabilities of our elderly users (usability & accessibility). Our first iStopFalls prototype will be evaluated and further enhanced based on the results of an initial pilot trial with 20 participants in Germany and Australia. The final iStopFalls demonstrator will be evidenced by a randomized clinical trial with 360 participants which will be implemented in Germany (90), Finland (45), Spain (45), and Australia (180).

Home-based exergaming: An effective fall preventive measure for the elderly

Smith, Stuart T; Delbaere, Kim; Lord, Stephen R

Neuroscience Research Australia, Australia.

With the expected increase in the number of people living to an older age, fall-related injury threatens to place significant demands on our public health care system. Fall-related injuries are the leading cause of injury-related hospitalisation in old age and with at least one third of community dwelling adults aged 65 and over fall once or more per year, the health burden within the community associated with falls is enormous. Over the past few decades, there has been a wealth of published scientific evidence for the physical, cognitive and social health-related benefits of increased exercise, especially in older adults. In particular, improvements in strength, balance, coordination and aerobic capacity leading to reduced levels of disability and better mobility function, as well as reduced fall risk in older populations, have been shown following exercise interventions. Despite the clear evidence base demonstrating the health-related benefits of PA, uptake and adherence to PA programs is often disappointing. Barriers to adherence may include lack of interest in the program, low outcomes expectation, the weather or even a fear of falling during exercise. Yardley and colleagues [1] report that home-based exercise has the widest appeal to older adults, and is also most attractive to those more socially deprived people who have the greatest need for undertaking falls prevention measures. One method by which compliance with exercise programs could be improved involves the use of fun and engaging videogames. Interactive videogames that combine player movement, engaging recreation, immediate performance feedback and social connectivity via competition, have been shown to promote motivation for, and increase adherence to, physical exercise amongst children and young adults. In older adults, videogames have also been shown to improve cognitive abilities, to be a feasible alternative to more traditional aerobic exercise modalities for middle-aged and older adults [2] and can be used to train stepping ability in older adults to reduce the risk of falls [3].

**Fall preventive exercises: A tailored fall preventive exercise program for older adults**

Kroll, Michael¹, Marston Hannah R¹, Delbaere, Kim², Eichberg, Sabine¹  
¹German Sport University Cologne, Germany; ²University of New South Wales, Australia.

It is well established that physical activity can decelerate age-related loss of physical function. Furthermore, exercise has a major role to play in the prevention of falls and fall-related risk factors among older people. In addition, active older people who exercise are less likely to develop physical disability, cardiovascular disease, hypertension, type 2 diabetes mellitus and osteoporosis. The iStoppFalls project aims to develop an innovative home-based exercise program for older adults using an information and communication technology (ICT) approach with a core component of both strength and balance exercises. The strength component is inspired on the Otago exercise program, which has proven effectiveness in the context of fall prevention and is also conducted in a home setting. The balance component will be incorporated into the exergame. The level of difficulty of the balance exercises will be increased within the exergame by (1) reducing hand support, (2) reducing base of support, and (3) weight shifting tasks through leaning, knee bending, and stepping. As the iStoppFalls exergame will be conducted in the comfort of people’s own homes, built-in safety measures insight the exergame using algorithms to detect falls with the Microsoft Kinect camera will ensure the participants’ safety during the exercises. This project provides an active translation of evidence-based approaches to falls prevention by using innovative ICT technologies. The iStoppFalls exergame has the potential to offer people a home-based individualized exercise program that might ultimately also be effective at reducing falls in older adults.

**A Senior Mobility Monitor for regularly measuring and evaluating daily life activities and movements**

Annegarn, Janneke  
Philips Research Europe, Netherlands

The iStoppFalls consortium and project will develop an embedded AAL system that can predict and prevent falls by monitoring mobility-related activities and other risk factors of falls in real-life. The iStoppFalls Senior Mobility Monitor platform (SMM) bases on proven technological validity towards objective assessment of balance function and muscle power.¹ Beyond continuous Fall Risk monitoring, this enables tailoring individualized exercise programs coached by iStoppFalls. The SMM is an inertial sensor system which can be worn as a necklace without restrictions. The SMM has two modes: 1) the daily monitoring mode and 2) the exercise mode. During the daily monitoring mode, the SMM provides solutions for continuously monitoring relevant mobility features of the user. The SMM will detect and evaluate sit-to-stand transfers, which reflects balance function and muscle power. Moreover, the SMM will provide information on the activity profile of the elderly. The SMM reports these mobility features on a daily basis. During the exercise mode, the SMM will be used to improve the fall risk assessment by improving the estimations of body sway during quit
standing and power during sit-to-stand transfers. With the SMM, fall risk assessment and trend analysis of balance capabilities can be performed not only in clinical tests, but also in daily life. Furthermore, this trend analysis provides information on the effect of the training exercises for the daily life of the user, and can give feedback to the training system for user specific tailoring of the exercises. Reference: Zijlstra, W., et al., A body-fixed-sensor-based analysis of power during sit-to-stand movements. Gait and Posture, 2010. 31(2): p. 272-278.

Measurement of balance-related biomechanical variables with video game devices
de Rosario, Helios; Belda, Juanma
Instituto de Biomecanica de Valencia, Spain.

In recent years, the computer and video games industry has experienced an important technology push that has brought to the market devices for enabling new forms of human-machine interaction. This includes motion capture technologies, like accelerometers and markerless optical systems that have long been used in human movement science for research in biomechanics. The low cost of these technologies, and the possibility of integrating them in home-based systems, makes the combination of video games and biomechanical analysis a feasible reality. The iStoppFalls project takes advantage of this opportunity for measuring balance-related biomechanical variables with a Kinect sensor and the Senior Mobility Monitor that will be used for assessing the risk of falling during the interaction of users with the “exergame.” One of the challenges of this approach is how to adapt the assessment criteria that depend on high-quality biomechanical measures, to a system that is originally designed for capturing gross movements, with fast and inexpensive resources, but lower precision than laboratory instruments. This problem is solved by a redefinition of the measurement protocols, plus advanced analysis of the variables captured by the video-game sensors, in order to reduce the distance between required and achieved precision. Fall risk assessment criteria that were previously validated in extensive field studies have been adapted to exercises that can be made at home, without supervision or additional instrumentation. A skeleton model with 10 joints has been tracked by Kinect, with joint angles corrected by an extended Kalman filter, in order to achieve kinematic parameters that can be compared with the results of a high-quality photogrammetry system.

Empirical analysis of end-user requirements: Designing ICT artifacts for the elderly exercising at home
Meurer, Johanna; Schöning, Sima; Stein, Martin; Wieching, Rainer
University Siegen, Germany.

We want to present first insight of designing community-oriented exergames for elderlies to motivate them to use fall preventive exercise training at home over a longer period of time. Older adults are often reluctant to use ICT systems in their homes, but fall preventive exercises need to be performed at least 3 times a week for 6 months to be effective. Thus, motivation and compliance plays a crucial role in this setting and ICT systems can provide very good support, if they are adjusted to the needs of the elderly end-users. End-user needs assessments were performed by participatory design sessions with end-users for discussion and idea generation by using market available input/output devices in order to develop user settings and scenarios for primary (exercising older adults at home) and secondary (care givers and relatives) end users. Implications based on empirical interviews and workshops were retrieved from 17 users from Germany and Spain so far. We build mock-ups that
illustrate our design idea of that elders might be interested in online communities while playing. Discussing the mock-up and the underlying assumptions with the elderly people in a participatory design workshop, however, showed that they have another perspective on this topic. For them, the design should focus on the necessary features to exercise fall preventive training in the most effective and efficient way instead of looking on nice-to-have community features. In this symposium, we want to discuss, how to deal with this different perspectives in participatory design and if and how community approaches could support motivation of older people to play fall preventive exergames. References: 1. Gillespie, L., Robertson, M., Gillespie, W., Lamb, S., Gates, S., Cumming, R. et al. (2010). Interventions for preventing falls in older people living in the community. Cochrane Database of Systematic Reviews (Online) (2), CD007146; 2. Mayring, P. 2007. Qualitative Inhaltsanalyse. Grundlagen und Techniken (9. Auflage, erste Auflage 1983). Weinheim: Deutscher Studien Verlag, 2007.

Modern fall prediction algorithms: Self-adaptive exercise training plans based on fall related data analysed over time

Drobics, Mario; Ejupi, Andreas; Kreiner, Karl
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To provide individual fall-prevention training plans within the project iStoppFalls it is necessary to assess the individual fall risk and training progress of each user in frequent periods. In conventional approaches for fall risk prediction, assessments are conducted in a clinical environment, supervised by a physician. Regular repetitions of the assessments are necessary to monitor the progress of the patient and to adapt the intervention strategy. This is very time consuming (for the patient and the physician) and thus expensive. Additional information, such as the daily activity of a person, can normally not be considered. In the project iStoppFalls, the risk assessments are conducted at the beginning and in regular intervals further on. These assessments are automated and can be done by the older adults in their own homes. Based on these risk assessments, an individual training plan is provided. As a baseline progression of the exercises will be increased linearly, based on the individual performance of the user and the repeated assessments, which guarantee a constant and realistic judgment of the performance of the user. This baseline is further modified based on an automatic analysis of the risk assessment data as well as data captured during the training sessions (duration, quality of execution, etc.) and data on the daily activity of the users (activity level over time, sit-to-stand time, etc.). To derive the according optimization models the data is analysed by experts during a test phase. They can make suggestions for changing the individual training plans (e.g. if the strength of a person is below average, then he has to do more strengthening exercises) and comment on the reason for their decision. This information is then analysed using statistical and machine learning methods to automate the determination of the individual fall risk and the regular adaption of the training plan to the individual needs.

ISPAPOFF SPECIAL SYMPOSIA: EXERCISE FOR FALLS AND FRACTURES

Invited lecture: Which balance assessment tests are fit for purpose?
Masud, Tash
Nottingham University Hospitals NHS Trust, UK.

The two main basic balance conditions are static balance and dynamic balance and humans employ different strategies to keep the centre of mass between the base of support in order
to stop falling over: 1. Proactive (anticipation of a predictive disturbance); 2. Reactive (compensation of the disturbance); 3. Static and Dynamic Steady State (maintain a steady position on sitting, standing or walking). A number of balance assessment tools are used in clinical practice and research. In order to decide which balance test to use, it is important to consider the purpose of the test: screening, falls prediction, clinical decision making, elucidation of pathophysiology, assessment of disease progression, and detection change after an intervention. The intra-rater and inter-rater reliability and test-retest reliability are also important properties of the tests. Simple clinical test include the “on leg stand”, “tandem walk”, “sit to stand”, “nudge test”, and “number of steps taken to turn 180 degrees”. “Gait speed” and “timed walk” (different versions) have a large associated literature and different cutoffs have been associated with falls risk, functional decline, hospitalisation, cognitive impairment and frailty. Many studies use the <1 m/s cutoff. Similarly the “timed up and go (TUG) test” has different versions (commonest is the 3m TUG) and assesses muscle power, dynamic steady state balance and turning ability. A >13-15 seconds cut-off for the 3m TUG has been associated with falls risk and in several settings has been shown to have good test-retest reliability and ability to detect change. The “BERG Balance Scale” (BBS) is commonly used by physical therapists. It is composed of 14 items scoring 0-4 (max score 56). Scores of 21-40 are associated with medium falls risk and <21 is associated with high falls risk. An 8-point change in BBS is considered clinically relevant. Other tests include the “Dynamic Gait Index,” “Elderly Mobility Scale”, “Functional Reach”, “Tinetti Performance Oriented Mobility Assessment” and “Functional Reach”. More sophisticated biomechanical tests include measurement of body sway, use of force plates, computerised dynamic posturography, and the multidimensional “Physiological Profile Assessment.” A popular recently developed tool is the “Gaitrite” mat which can measure gait variability. The latter parameter has been shown to be highly associated with falls risk. It is also a useful tool to research balance impairment in dual tasking conditions which have also been associated with increased falls risk. Measurements of confidence and “fear of falling” include different versions of the “Falls Efficacy Scale” and the “Activities Specific Balance Confidence (ABC) scale.”

Invited lecture: What do we know about exercise and bone health?
Brooke-Wavell, Katherine

School of Sport, Exercise and Health Sciences, Loughborough University.

Loss in bone density and strength with age, combined with increased risk of falls, contributes to increasing risk of osteoporotic fracture. One in two women, and one in five men aged 50, will sustain a fracture in their lifetime. Exercise can increase bone gains during puberty, and these benefits may persist into adulthood. Starting exercise in adulthood has more modest effects on bone density, and in older adults (particularly postmenopausal women) benefits may be smaller still, although exercise interventions that are adequate in terms of type and intensity have been found to benefit bone density at all ages. The optimal types of exercise for increasing bone density exert high forces on bone at the skeletal sites susceptible to fracture; for instance impact exercise and high magnitude resistance exercise. The ideal frequency and duration of exercise are not yet known, although extremely high training volumes, particularly when associated with menstrual dysfunction, may adversely affect bone and animal studies suggest brief loading bouts separated by rest pauses are most effective at increasing bone mass. Mechanical loading can increase bone strength to a greater extent than bone density. This may be a consequence of adaptations in the distribution, as well as the quantity, of
bone. Recent research using computed tomography techniques has demonstrated changes in structural parameters in humans. Exercise interventions can also reduce fall incidence in older people, so exercise may reduce fracture risk to a greater extent than expected from bone density changes alone. Most observational studies have reported substantially lower fracture incidence in regular exercisers, although there have been no intervention studies large enough to evaluate changes in fracture risk. Exercise that adequately loads relevant skeletal sites can thus produce modest increases in bone density and could further reduce fracture risk through benefits to bone structure and fall risk.

Effectiveness of primary care physical activity interventions in older adults: A narrative review

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1 University College London; 2 University of Nottingham; 3 Nottingham University Hospitals NHS Trust and University of Derby; 4 Glasgow Caledonian University.

Background: Primary care is an important setting to promote physical activity to older adults. Current interventions provide counselling, advice, and exercise on prescription; their effectiveness is presently unknown. Aim: To review the effectiveness of physical activity interventions which have recruited older adults through primary care and/or were delivered through primary care. Design: Narrative review. Method: Studies published between 1998 to July 2011 were found in electronic databases. We searched for studies providing structured physical activity interventions, regardless of study design, to older adults (aged 50 plus) through primary care. The search and selection process was not restricted to any outcome measures or comparison groups. Full texts were obtained of eligible studies. Studies were selected by two reviewers who independently assessed for quality using Jüni et al.’s criteria and in accordance with the RE-AIM criteria. Results: Six out of 4170 studies met the inclusion criteria, with 1522 participants included. The interventions ranged from 12 weeks to one year. Three studies showed a statistically significant increase in activity in the intervention compared to the control group (p<0.05). The three studies that measured quality of life and presented results from the SF-36 reported inconsistent results. Conclusion: Studies in this review show some evidence for the effectiveness of physical activity interventions in primary care for older people. More research in this area is needed to expand the evidence base for effective interventions in primary care for older adults, and make recommendations to primary care staff and settings. Keywords: Primary care, older adults, physical activity, exercise, general practice.

A comparison of the ground reaction forces of the pas de basque Scottish country dance step and three exercises used in osteoporosis exercise classes

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Background: It is acknowledged that impact forces are required for good bone health. However, few studies have measured impact force in postmenopausal women. Scottish country dancing (SCD) pas-de-basque step may be an appropriate activity although the specific ground reaction forces (GRF) are unknown. Kemmler et al., (2004) reported that activities which generated GRF ranging between 1.5 to 3.5 times bodyweight (× BW) were sufficient to offset bone loss in this population. Aims: This study aimed to compare the GRF generated
during the pas de basque, to marching, sidestepping and walking weight bearing exercises that are often used in osteoporosis classes. **Methods:** A within subject study was carried out to measure ground-reaction force. Twenty one postmenopausal women aged 65.62 (± 7.45 years) who were regular Scottish country dancers provided the sample. After a five min warm up measurements of walking, left and right marching, left and right side stepping and left and right pas-de-basque were carried out on a Kistler force plate three times and the mean was established. **Results:** The median GRF for the pas-de-basque was 1.94 × BW and significantly higher (p < 0.001) than the mean values for marching 1.39 × BW, sidestepping 1.31 × BW or walking 1.21 × BW. **Conclusion:** These findings suggest that Scottish country dance that includes the pas de basque step may provide GRF that can offset bone loss and maintain bone health in postmenopausal women. **Keywords:** Postmenopause; Measurement of Walking; Osteoporosis; Bone Health; Scottish Country Dance.

**Factors associated with initiation of weight-bearing activity in older men and women: Influence of osteoporosis screening and education intervention**

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1University of Regina, Canada; 2Saskatchewan Ministry of Health, Canada; 3Regina Qu’Appelle Health Region, Canada.

**Objective:** Weight-bearing physical activity has been shown to improve bone health and prevent osteoporosis; however many older men and women do not engage in such activity. This study determined the factors associated with men and women’s decision to start or increase weight-bearing activity to prevent or manage osteoporosis. **Methods:** The study population consisted of men and women 50 years of age and older (range 50-80 years), enrolled in a 6-month randomized controlled trial assessing health behaviour change after screening alone or combined with a theory-based education program. Eligible men (n = 25, mean age 64.1 ± 7.3) and women (n = 157, mean age 59.1 ± 6.8) were referred by their healthcare provider to undergo dual energy x-ray absorptiometry (DXA) screening for the first time at the local hospital. All participants underwent screening and completed a series of measurements and questionnaires assessing osteoporosis health and lifestyle behaviours, including physical activity and dietary intake. The intervention group also received theory-based osteoporosis education. Six months after baseline, participants completed a series of follow-up measurements and questionnaires to determine change in health behaviours. **Results:** Based on World Health Organization criteria, 11.6% of men and women were newly diagnosed with osteoporosis and 48.1% with osteopenia. Only 25.8% of men and women reported change in weight-bearing physical activity at follow-up. After adjustment for confounding covariates in logistic regression analysis, factors associated with change were osteoporosis diagnosis (OR, 2.78; 95% CI, 1.01-7.61) and receiving recommendation from a healthcare provider (OR, 4.90; 95% CI, 2.17-11.04). **Conclusions:** This study provided evidence that osteoporosis diagnosis and healthcare provider recommendations influence decisions to initiate weight-bearing activity; however improvement in initiation rates are needed in order to prevent and manage osteoporosis. **Keywords:** Osteoporosis; Bone Health; Weight-Bearing Physical Activity; Healthcare Provider.

**UPTAKE AND ADHERENCE TO EXERCISE AND PHYSICAL ACTIVITY IN DEVELOPED AND DEVELOPING COUNTRIES**

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1University of Manchester, UK; 2Our Lady of the Lake College, United States.
Encouraging older adults to become more active and maintain that activity is critical to the promotion of their health and well-being, maintaining social networks and independence. A variety of physical activity (PA) interventions are readily available for older adults. However, the uptake and adherence to these activities remains problematic with dropout rates from structured programs being high. This symposium explores uptake and adherence to physical activity with a range of older adults in different settings looking at both exercise instructor and older adults’ perspectives. The symposium will conclude by drawing together issues of how to design programs that promote uptake and adherence to exercise and PA programmes.

Aim: This workshop aims to provide an overview of 5 studies with an emphasis on key recommendations for policy, research and discussion on implication for practice. Keywords: Health; Wellbeing; Physical Activity; Developed and Developing Countries.

Older adults’ uptake and adherence to exercise classes: The role of the instructor
Hawley, Helen
University of Manchester, UK.

Background: Leadership behaviour and quality of instruction is important in influencing engagement of older adults in exercise classes. Little is known about the relationship between attitudes and characteristics of instructors and their delivery in relation to uptake and adherence of older adults to classes. Methods: We present the findings and recommendations from three studies: A survey of 731 United Kingdom exercise instructors with Level 3 older adults exercise qualifications which investigates instructors’ characteristics and attitudes towards older-adults’ participation in exercise. Interviews with 19 instructors to further explore their attitudes, experiences and beliefs in relation to their exercise classes for older adults and how these experiences and beliefs are influenced by training and characteristics. A longitudinal cohort study of 16 instructors and 193 class participants over 6 months to explore what characteristics of exercise instructors, the group and class participants influence adherence. Findings: The first study establishes that there is a relationship between instructors’ training, experience, characteristics and their attitudes. The second study supports these findings and demonstrates how instructors’ think that these factors and others not only influence how they deliver and promote their classes but also influence older adults’ uptake and adherence to exercise classes. The final study enables us to look at the relationship between instructor variables and the participant within the exercise class setting. Class participants’ mental well-being, education and housing were key factors related to their attendance. Having attended the class for more than six months at baseline was an important factor related to adherence. Individual factors such as participants’ attitudes, beliefs about group cohesion and instructor variables such as personality traits and experience emerged in the final models both in relation to participant attendance and adherence. Conclusion: There are a series of complex interactions between the instructor, participant, the group and others which influence beliefs and attitudes and this needs to be acknowledge in future research, practice and policy. It is clear that the instructor can influence participants and they have an important role to play in creating an atmosphere and environment of which participants want to be a part of. References: 1. Dinan, S. (2001). Delivering an Exercise Prescription for Vulnerable Older Patients. In Young, A., Harries, M (Eds.), Physical Activity for Patients: An Exercise Prescription (pp.121–132). London: Royal College of Physicians; 2. Ecclestone, N.A., & Jones, J. (2004). International Curriculum Guidelines for Preparing Physical Activity Instructors of Older Adults, in collaboration with the Aging and Life Course.
Older adults’ perceptions of the influence of exercise instructors in the uptake and adherence of exercise

Horne, Maria
University of Manchester, UK.

Background: A variety of physical activity (PA) interventions are readily available for older adults, but uptake and adherence to these activities remains problematic with drop-out rates from structured programs being high.1,2 Exercise instructors have been found to influence older adult’s attendance and adherence to general exercise classes.3,4 However, further exploration of older adult’s perceptions and experience of how exercise instructors influence their exercise behaviour is needed to develop and deliver exercise services for older adults.

Aim: To explore South Asian and European 60-70 year olds perceptions of how exercise and leisure instructors influence PA uptake and adherence to community based and leisure centre exercise classes. Method: An exploratory qualitative approach was utilized using 15 focus groups (n = 87) and 40 in-depth interviews were conducted to explore the motivational factors associated with initiating and maintaining exercise and PA among SA and European older adults. Data analysis followed the framework approach. Findings: Three themes were identified: [1] Personal attributes of the instructor; [2] Level of support; [3] Understanding. The personal attributes - ‘pleasant’ instructors, good interpersonal skills, were perceived to be a good motivator to continue with group based exercise and physical activity pursuits. Specific exercise and general social support received by exercise instructors before, during and after community-based and leisure-centre exercise classes was found to be important in motivating and encouraging older people to perform exercise and get through the activity, particularly when self-motivation and experience are low. Lack of instructor support to teach and lead older adults through routines safely resulted in terminating the activity. Understanding the needs of older people and the specific issues they may face in undertaking exercise was considered important in continuing to attend exercise groups. Conclusion: Exercise instructors are an important source of motivation for older adults, particularly when self-motivation and experience are low, and an important influencing factor in both uptake and subsequent adherence to exercise and PA among both South Asian and European 60-70yr olds.

Developing culturally informed physical activity programs to increase the uptake and adherence of exercise and PA

Skemp, Lisa

Our Lady of the Lake College, United States.

Background: A variety of physical activity (PA) interventions for older people are readily available; however, uptake and adherence to these interventions remains problematic. This is particularly true for older adults who not only have comorbid health conditions and various levels of physical abilities, but diverse cultural backgrounds. While Community Based Participatory Research (CBPR) aims to partner with communities as the unit of identity, problem identification, planning and implementation for sustainability,1,2 problem identification often is in the purview of the researchers, who bring their expertise to the community.

Project: This presentation describes the Culturally Informed Healthy Aging (CIHA) model that is being used in preparation for CBPR on physical activity program development for older adults in two countries: a rural village on the island of St. Lucia, West Indies and a rural village in south India were there were no formally organised exercise programmes. Derived from the Culturally-Informed Community Nursing model3 we describe the process whereby we partner with community members, collectively indentify their health needs and use “cultural capital” and evidenced based practice interventions in the development of culturally informed PA programs tailored for older adults, including those with advanced frailty.

Findings: Grounded in principles from ethnography, epidemiology, and community based research, the CIHA is a stable systematic process whereby community members partnered with academics and students in the identification of healthy issues of importance in the community. Systematically assessing the environment, population and social organization facilitated the identification of groups of elders who were interested in addressing mobility issues and the community members interested in working with the academics and elders in developing and facilitating these programs. Identification of partnership readiness and research design for program implementation is underway. Challenges to program design and CBPR include community uncertainty associated with community disasters and resource scarcity. Community mechanisms for sustainability are grounded in member engagement and passion for the utility of the community program. Conclusion: Description and comparison of the programs informs understandings of how to design programs to promote CBPR uptake and adherence of PA in rural communities.


GOING OUTDOORS, FALLS AND RESILIENCE

Goodwin, James1 with contributions from the Universities of Bournemouth, Edinburgh, Glasgow Caledonian, Salford, Southampton, and Swansea.

1AgeUK, London, UK.

Going outdoors is a key factor in preserving good physical, mental and social health in all age groups, but particularly as people move into older age. Approximately one third of people aged 65+ living in the community fall at least once per year, with many suffering multiple falls which can lead to disability and decreased mobility. Also, fear of falling is a key inhibi-
tor of getting outdoors for older people. Many of the environmental risk factors associated with outdoor falls appear to be preventable through better design and maintenance. However, research to date has neglected outdoor falls and focused on the indoor environment. We report on a current 12-month pilot study structured around 4 work packages which brings together a multi-disciplinary group across 6 UK Universities, plus AgeUK, Toronto Rehab, Marshalls paving, and the Health and Safety Laboratory. These work packages involve mapping of geographical ‘hotspots’ where older people fall most often; focus groups with older people to identify key risk factors for falling; the development of a person-environment fit audit tool to identify environmental interventions; and the development of a pilot protocol to test surface slip of pavement materials. The synergy of knowledge generated by this pilot testing will allow for a greater understanding of the many factors involved in outdoor falls. There is potential for this to support the development of evidence-based practice which will significantly impact on older people’s health and wellbeing. The study is funded through the Medical Research Council grant reference G1002782/1 as part of the Lifelong Health and Wellbeing Cross-Council Programme. Full details available at www.go-far.org.uk

Meet-the-Expert Sessions

SO YOU WANT TO RUN A GERI-OLYMPICS?

Muilenburg, Ted; Woodrum, Bill

West Virginia State University, United States

Geri Olympics Programs have promoted active living, wellness and quality of life through competitive sports for seniors residing in nursing homes for 25 years. Each year over 150 nursing home resident athletes gather from across our state to compete in various adapted sports. The program involves resident athlete training and practice as well as being a member of a nursing home team in preparation for competitions. Several of the events have been recommended by therapists as a means of improving motor coordination and pulmonary function. Come and have a discussion about the barriers, facilitators, successes and useful tips and of course, share your experiences and events!

SCOPE OF PRACTICE: WHEN IS FITNESS REALLY THERAPY FOR MATURE ADULTS?

Sipe CL.

Harding University, United States.

Mature adults represent the fastest growing segment of the population and of the fitness industry. They also represent the largest patient population (over 40% of all patient care) within physical therapy and physiotherapy. Aging is associated with an increase in disease prevalence such as cardiovascular disease, osteoporosis, musculoskeletal impairments and arthritis. Unfortunately, the line between exercise for fitness and exercise for therapy is often unclear. While the scope of practice for physical therapists and physiotherapists is well defined it is not equally so for fitness professionals. The fitness industry is a largely unregulated profession and currently there are no uniform standards of education or training that exist for exercise professionals. As the number of mature adults seeking exercise training rises the potential for trainers to infringe upon the duties of the therapist also rises. This leaves trainers potentially liable for medical malpractice lawsuits. Exacerbating this
problem is the recent proliferation of “corrective exercise” courses and certifications that teach trainers how to identify and resolve specific musculoskeletal imbalances and movement disorders. Since mature adults have a high prevalence of both of these, they are a prime population to target as potential clients of “corrective exercise specialists.” Recently, a joint working party between the European Health and Fitness Association and the Chartered Society of Physiotherapists published guidelines on when to refer clients/patients between the therapist and the trainer. These guidelines provide general recommendations and give examples for several health conditions. While these guidelines are an important step in the right direction much more needs to be done to ensure that mature adults are receiving the appropriate level of care that they need for their specific health concerns. Come and have a discussion about the scope of practice.

Oral Presentations

EXERCISE FOR FALLS, BALANCE AND BONE HEALTH

Invited lecture: Specific exercise for fall prevention

Campbell AJ.

University of Dunedin, Otago, New Zealand.

In people 70 years and over 20% of falls occur while participating in high-level activities, 20% of falls can be attributed to a single cause and the remainder of falls are due to multiple contributing factors. Impaired strength and balance are often key components or the final pathway of these multiple factors. The causes of the impaired strength and balance need to be sought but often increasing inactivity is the most important factor. In many older people, a specific, individualised programme is needed to restore function and stability. Falls are so common that it is beyond the capacity of most health systems to deal with the problem solely through the individual assessment and referral of all those at risk to a number of different health professionals. If the large problem of falls in frail older people is to be addressed, we need targeted community programmes that can address common causative factors such as impaired strength and balance in the most cost effective way. This should ensure maximum cover of those at risk. There is strong trial evidence to justify this approach.

Exercise for improving balance in older people

Howe, Tracey1; Neil, Fiona2; Rochester, Lynn3; Ballinger, Claire4; Skelton, Dawn A1

1Glasgow Caledonian University, UK; 2Greater Glasgow & Clyde Health Board, UK; 3Newcastle University, UK; 4Southampton University, UK.

Background: In older adults, diminished balance is associated with reduced physical functioning and an increased risk of falling. Objectives: to examine the effects of exercise interventions on balance in older people, aged 60 and over, living in the community or in institutional care. Results: 94 randomised controlled studies with 9,917 participants were included. There were eight categories of exercise programmes. 1. Gait, balance, co-ordination and functional tasks. Positive effects of exercise were found for the Timed Up & Go test, walking speed, and the Berg Balance Scale. 2. Strengthening exercise (including resistance or power training). Positive effects were found for the Timed Up & Go Test; standing on one leg for as long as possible with eyes closed; and walking speed. 3. Three dimensional
exercise (including Tai Chi, qi gong, dance, yoga). Positive effects were found for the Timed Up & Go Test; standing on one leg for as long as possible with eyes open, and with eyes closed; and the Berg Balance Scale. 4. General physical activity (walking). 5. General physical activity (cycling). 6. Computerised balance training using visual feedback. 7. Vibration platform used as intervention. 8. Multiple exercise types (combinations of the above). Positive effects were found for the Timed Up & Go Test; standing on one leg for as long as possible with eyes open, and with eyes closed; walking speed; and the Berg Balance Scale.

Conclusions: In general, effective programmes ran three times a week for three months and involved dynamic exercise in standing. There was weak evidence that some exercise types are moderately effective, immediately post intervention, in improving balance in older people.

Keywords: Exercise; Balance; Interventions; Tai Chi; Yoga; Improvement.

Xbox Kinect training may improve balance measures in older adults

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Training using Microsoft’s Kinect for Xbox 360 may be a novel way to improve balance in older adults. The purpose of this study is to investigate the feasibility of training using the Kinect to improve clinical measures of balance in older adults. It is hypothesized that older adults who train with the Kinect will increase their Berg Balance Scale (BBS) score and Functional Reach (FR). Thirteen older adults (82.3 ± 5.1 years old) participated in the study. BBS and FR were completed before, one week, and one month after a three week training period. Six participants completed the training using the Kinect while seven subjects served as control and did not train. Three times each week, the training group was led through a custom routine that lasted approximately 30 min. The first 15 min was comprised of Your Shape: Fitness Evolved Zen sessions (Stream 1 and 2) followed by 15 min of games from Kinect Adventures. Clinical measures of balance before training were compared to one week and one month after training. An increase in BBS and FR would be considered an improvement in balance. Paired t-tests were conducted on the training and control group to determine if training influenced measures of balance. BBS scores significantly increased one week and one month after training when compared to before training for the experimental group (p < 0.05). There was no significant change in BBS for the control group (p > 0.05). FR was not significantly different from before training for either the control group or experimental group (p > 0.05). In conclusion, this pilot study provides some evidence that training using the Kinect can lead to improvements in some clinical measures of balance in older adults. A larger study is needed to confirm the efficacy of training using the Kinect as a method to improve balance. This training may be a fun, novel, and cost-effective way to improve balance in older adults. Keywords: Kinetic Training; Balance; Berg Balance Scale.

Looking for the right balance: Consideration of exercise approaches in the menopause transition, healthy ageing and early falls prevention

Fu, Stephanie1; Low Choy, Nancy2; Nitz, Jennifer1

1The University of Queensland, Australia; 2Bond University, Australia.

Background: Poor balance has been identified as one of the main factors contributing to falls in the older person with studies demonstrating detrimental change in sensorimotor factors in adults after 40 years of age. This series of studies investigated the efficacy and long term benefits of a specific balance-strategy training (SBST) program for healthy but less active
women during menopause transition compared to other common exercise programs and whether participation led to adoption of a more active lifestyle. **Method:** 84 healthy women were admitted to the study and allocated to groups on the basis of their activity level. 50 Sedentary participants were assigned to RCT. Intervention group attended 24 SBST sessions were compared to controls at baseline and for 3, 9 and 24months assessments. The SBST group was also compared to 34 women who exercised at a moderate to high intensity level at baseline and 24 months. **Result:** RCT intervention group showed significant improvement in balance measures (p < 0.003), tactile acuity (p = 0.027), ankle flexibility (p < 0.000), lower limb strength (p < 0.006) compared to sedentary controls immediately after intervention. At 3-months, most improvement was maintained for the SBST group with continued significant improvement in balance (p < 0.05), somatosensory function (p < 0.046), muscle strength (p < 0.046) and cardiovascular endurance (p = 0.000). At 24months the SBST group had attained the same cardiovascular endurance level as the exercise control group, women in the SBST group showed sustained weight loss (p < 0.017) while exercising controls showed a steady weight gain (2.21 ± 3.90 kg). **Conclusion:** SBST program is comparable in effect to every-day exercise programs. It leads to adoption of a more active lifestyle for less active women aged 40 to 60 years. Verification of the SBST program outcome with 517 healthy older people aged over 65 produced a similar outcome regarding reduction of falls risk factors and for foster healthier ageing. **Keywords:** Balance; Fall Risk Factors; Intervention; Exercise.

The effects of a 12-week community based exercise programme on the prevention of falls in older people: The Liveability Programme

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**Introduction:** Falls are a main cause of morbidity in older adults. Preventive measures such as regular physical activity (PA) can be applied to avoid the adverse implications of falls and injuries on public health. Liveability programme aimed to reduce the risks of falls in people age 60+ through increased PA. **Methods:** Forty-two participants (71% female) aged (60+), were recruited (intervention group = 25, comparison group = 17) with measures taken pre and post programme. Twice weekly 1-hour classes were conducted in a leisure centre. A mixed method approach entailing: quantitative (questionnaire: Physical Activity Score for Elderly; PASE, Falls Risk Assessment Tool; FRAT, Confidence in Balance), qualitative (focus groups) and objective measurements (senior fitness test, SFT) were used. **Results:** There were significant interaction effects (P < .05) for PASE, FRAT, Confidence in Balance and SFT between the two groups before and after the intervention. In the treatment group PA increased by 34%, confidence in balance by 7%, falls risk reduced by 20% and improved functional mobility and flexibility increased by 59%. These compared to 3% increase in PA, 7.5% decrease in confidence in balance, 1.3% improvement in FRAT and 42% improvement in SFT in the comparison group. Qualitative data yield improvement in participants general well being and fitness. **Discussion:** A recently published systematic review stated that 2 hours of challenging exercise could reduce the risk of falls by 16% (Sherrington et al., 2011). The Liveability programme included 2-hour weekly challenging activities that included a mixture of strength, flexibility and balance exercises in a structured instructor led group session. This mixture of exercises not only increased habitual PA but also reduced the risk of falls, improved confidence in balance and increased functional mobility and fitness. **Keywords:** Falls Risk Assessment; Balance Exercises; Falls; Mobility.
Exercise for preventing and treating osteoporosis in postmenopausal women

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Background: Osteoporosis is a condition resulting in an increased risk of skeletal fractures due to a reduction in the density of bone tissue. Treatment of osteoporosis typically involves the use of pharmacological agents. In general it is thought that disuse (prolonged periods of inactivity) and unloading of the skeleton promotes reduced bone mass, whereas mechanical loading through exercise increases bone mass. Objectives: To examine the effectiveness of exercise interventions in preventing bone loss and fractures in postmenopausal women.

Results: Forty-three RCTs with 4320 participants were included. The most effective type of exercise intervention on bone mineral density (BMD) for the neck of femur appears to be non-weight bearing high force exercise such as progressive resistance strength training for the lower limbs (MD 1.03; 95% confidence interval (CI) 0.24 to 1.82). The most effective intervention for BMD at the spine was combination exercise programmes (MD 3.22; 95% CI 1.80 to 4.64) compared with control groups. Fractures and falls were reported as adverse events in some studies. There was no effect on numbers of fractures (odds ratio (OR) 0.61; 95% CI 0.23 to 1.64). Overall, the quality of the reporting of studies in the meta-analyses was low, in particular in the areas of sequence generation, allocation concealment, blinding and loss to follow-up. Conclusions: results suggest a relatively small statistically significant, but possibly important, effect of exercise on bone density compared with control groups. Exercise has the potential to be a safe and effective way to avert bone loss in postmenopausal women. Keywords: Osteoporosis; Fractures; Bone Health; Falls Prevention.

ADHERENCE TO AND OUTCOMES OF FALLS EXERCISE IN FRAILER OLDER PEOPLE

Predictors of exercise dose during a 1-year home-based exercise intervention for older people recently discharged from hospital

Ramsay, Elisabeth M1; Sherrington, Catherine2; Close, Jacqueline CT1; Lord, Stephen R1; Barraclough, Elizabeth2; Kirkham, Catherine2; O’Rourke, Sandra2; Vogler, Constance3; Dean, Catherine4; Clemson, Lindy2

1University of New South Wales, Australia; 2University of Sydney, Australia; 3Royal North Shore Hospital, Australia; 4Macquarie University, Australia.

Background: A randomised controlled trial of a 12-month tailored home exercise program designed to minimise disability and prevent falls is being conducted among 340 older adults recently discharged from hospital. Aim: To describe exercise dosage and predictors of dosage in the first 150 intervention group participants. Methods: Exercise repetitions completed (number of agreed reps per session × number agreed weekly sessions × study physiotherapist’s estimate of percentage agreed dose undertaken) were calculated for months 1, 3, 8 and 12. The total number of reps undertaken over these 4 months was estimated by adding the monthly totals. Possible predictors of exercise dose completed, including Physical Activity Stages of Change (Marcus, 1992) were investigated using univariate linear regression. Results: Participants: mean age = 82 years (SD = 7.9, range 62-100 years), 110 female (73%), 87 lived alone (58%), 51 used a walking aid indoors (34%). Total repetitions of lower
limb exercises over the 4 months: mean = 1185, SD = 1103, range = 0 to 4704. Predictors of fewer total reps were: increased age (B = -46, 95%CI = -68 to -25, P < 0.001), living alone (B = -534, 95%CI = -886 to -183, P < 0.003), using a walking aid indoors (B = -464, 95%CI = -834 to -95, P < 0.014), one or more falls in past 12 months (B = -273, 95%CI = -273 to 197, P < 0.169), greater number of co-morbidities (B = -87, 95%CI = -149 to -25, P < 0.006), and being in the precontemplation” or “contemplation” Stage of Change (rather than “preparation”, “action” or “maintenance” stage; B = -680, 95%CI = -1060 to -300, P < 0.001).

Conclusion: Increased age, living alone, use of a walking aid indoors, one or more falls in the past 12 months, greater number of co-morbidities, and lower Stage of Change all predicted fewer repetitions completed. This information can be used in the design of future exercise programs.

Keywords: Home Exercise; Walking; Exercise Dosage; Intervention.

Prevalence and correlates of older adults’ adherence to the fall prevention recommended exercise

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Background: Older adults’ compliance with recommendations for falls prevention is rarely reported. This study determines the prevalence and correlates of older adults’ participation in strength and balance training.

Methods: A random sample of 5,681 older adults (>65yrs) took part in the New South Wales (Australia) Fall Prevention telephone survey (61% response-rate) in 2009. Participants reported doing specific balance exercise, dance, tai-chi and team sports (i.e., sailing, squash, volleyball). An expanded definition for balance activities also included lawn bowls, golf and all team sports. Meeting the recommendations required at least twice weekly participation in any balance (expanded) or strength training. Multivariable logistic regressions were used to identify correlates of participation in any strength or the expanded balance-enhancing classification.

Results: One in eight older adults participated in strength training (12.0%, 95% CI: 11.0-13.0) and 12.2% (95% CI: 11.2-13.1) or 21.8% (95% CI: 20.5-23.0) challenged their balance by ‘narrow’ or ‘expanded’ definitions, respectively. Less than a third (28.4%, 95% CI: 27.1-29.8) adhered to either strength or the expanded balance recommendations and only 3% adhered to both. Men, younger seniors (<75yrs), those with higher education (‘high-school) and those who live in advantaged neighborhoods were significantly more likely to engage in strength or balance activities. Seniors who were obese, rated their health status below very good/excellent, had problems with walking or used a walking aid were significantly less likely to participate. Falling in the past 12 months was not associated with increased participation.

Conclusion: There is low adherence to balance and strength recommendations among older adults. Efforts to increase seniors’ participation are urgently needed at the population level and in high-risk groups. Continuing research on activities that improve balance in old age is also warranted.

Keywords: Balance, Strength; Falls Prevention; Telephone Survey; Tai-Chi.

Physical activity and falls benefits of medium term adherence to the home activity monitoring program (HAMP) for older adults

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1Hampstead Rehabilitation Centre, Australia; 2Royal Adelaide Hospital, Australia.
HAMP (Home Activity Monitoring Program) a home based activity program for older adults was developed and implemented in 2005 by Active Ageing Australia®. The outcomes of this program (1) included increased physical activity (PA) and reduced incidence of falls (FI). HAMP ceased in September 2008 when participants were advised to continue independently. Methods: A previously surveyed group of HAMP participants (123) were contacted in 2009, to review current PA, self-rated health (HS) and FI in the previous 12 months. Telephone and posted questionnaires were used. Results: 76 (62%) replied of which 53 people were currently exercising (CE) and 23 non-exercising (NE). 65 were females and 11 males, average age was 81 years. 58 (76%) had two or more chronic medical conditions and the average number of medications taken was 5. Of CE respondents 30 (57%) were still using HAMP. 23 (43%) of CE respondents undertook other PA. 74% (17) of the NE group rated their health as poor to fair compared to 68% (36) of CE group. FI in the previous 12 months prior was 17% (5) for the NE group compared to 23% (12) for the CE group. 67% of all respondents indicated they would like further direct contact regarding HAMP. Discussion: Medium term PA status of HAMP participants supported its use. CE survey respondents indicated that they had support and recommendation to continue their HAMP participation. FI WAS lower than population based expectations regardless of PA or self reported HS. Further research into the benefits of HAMP has commenced including train the trainer for allied health assistants within various aged care services in South Australia. Conclusion: Adherence to PA and associated influence on FI supports the HAMP potential for wider implementation for older adults. References: 1. Penhall R, Barnard R. Home Activity Monitoring Project (HAMP) for Improving Functional Performance and Reducing Falls in Older Persons. Journal of Nutrition, Health and Aging, 13 (Suppl 1): S423-4, 2009. Keywords: Home Activity Monitoring Program; Questionnaires; Falls.

Preventing functional loss during immobilisation after osteoporotic wrist fractures in elderly patients: A randomised clinical trial

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Background: Therapy results after distal radius fracture especially of elderly patients are often suboptimal. The inevitable immobilization for several weeks leads to reduction in ROM, deterioration of muscle strength, malfunction of fine motor skills as well as changes of motor and sensory representations in the brain. Currently, there are no strategies to counteract these problems. The overall aim of the study is to investigate the therapeutic potential of a motor-cognitive therapy (Mental Practice [MP] or Mirror Therapy [MT]) on hand function after wrist fracture. The pilot should provide information about 1) the necessary recruitment rate and compliance for an adequate sample size, and 2) adequate measures.

Methods/Design: Patients aged 60 years and older with a distal radius fracture participate in a double-blinded, randomized controlled trial. The experimental groups [EG] receive either MP or MT; the control group undergoes relaxation training. The EGs undertake a six-week, individually tailored therapy regime focused on improving hand function. All groups were visited at home for therapy sessions 5 times a week for the first 3 weeks and 3 times a week for week 4 to 6. Measurements will be taken at therapy onset, and after 3, 6 and 12 weeks. Primary outcome measures will assess upper extremity functioning (PRWE), while secondary outcome measures cover subjective wrist function, objective impairment (ROM, grip force) and quality of life (DASH, EQ5D). Discussion. Up to January 2012, 17 women were enrolled, of whom 15 participated successfully and showed a high compliance, only 2
resigned. The randomization process distributed participants equally to the groups, based on the variables age and motor imagery capacity. To test the effects of treatment, between-group differences will be examined with MANOVA with repeated measures. Intention-to-treat principle will be applied. We are planning to finish the intervention period in June 2012.

**Keywords:** Fractures; Relaxation Training; Motor-Cognitive Therapy.

**Physical activity early after hip fracture: The Trondheim Hip Fracture Trial**

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**Objective:** Early mobilisation after a hip fracture in older persons is important for reducing negative effects of bed rest and inactivity, and for regaining function. Data from our research group three months after a hip fracture have shown that activity level - measured as upright time - was close to 4.5 hours per day. The aim of the present study was to investigate daily physically activity on the fourth day after hip fracture surgery and to describe factors associated with this activity level.

**Methods:** The Trondheim Hip Fracture Trial included 398 hip fracture patients that received treatment in either an orthopaedic (treatment arm 1) or orthogeriatric (treatment arm 2) hospital ward. In 317 of the patients, daily physical activity was monitored during 24 hours by a single axis accelerometer worn on the thigh the 4th day post surgery. Outcome measure was time spent in upright activities (i.e., standing and walking).

**Results:** Preliminary analysis shows that mean upright activity time for the 317 patients (75% women) was 48.2 min (SD 1 hour and 2 min). Twelve participants were sedentary (sitting or lying) the entire day.

**Conclusion:** Four days after hip fracture surgery, mean activity level was low, with large variations in upright time between patients. Further analyses will assess potential differences between patients in the two treatment arms and factors associated with different activity levels.

**Keywords:** Fractures; Activity Level; Surgery; Bone Health.

**Otago from 180 degrees: The older person’s perspective**

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NHS Forth Valley and local authority partners have been working collaboratively to deliver the OTAGO strength and balance programme since 2008. The clinical outcomes of a previous study indicated clear improvements in indoor and outdoor independence; walking aid use; timed up and go, 180-degree turn and chair rise ability. In addition, patient experience of those attending the programme was sought.

**Methodology:** An anonymised pre and post programme questionnaire was completed by patients attending the day hospital.

**Results:** There were 221 responses to the pre-programme questionnaire with a response rate of 65% (n = 143) to the post-programme questionnaire. Pre-programme questionnaire responses: 55% were aged 80+; Patients who don’t exercise 40%; Patients who were afraid of falling 81%; Patients who feel their fear of falling limits their activity 40%; Patients with at least one fall in last 6 months 64%; Patients with at least one fall in last 6 months which resulted in a hospital admission 42%. Post programme questionnaire responses (n = 143): 52% were
aged 80+; Exercising more than previously 74%; Had a desire to continue exercising 87%; Less afraid of falling than previously 40%; Feel less likely to fall 67%; Feel more confident than previously 61%; Feel strength has improved 90%; Feel stamina has improved 60%; Feel posture has improved 79%; Feel balance has improved 76%; Reported fall since starting the programme 22%. What the participants said: “Confidence greatly improved, posture much better, balance much better” “Made me more aware of surrounding, more confidence, feel stronger, made me want to do more exercise…” “Feel less likely to fall because I am more aware” “Balance, posture, outlook in life, confidence, all much better.” Conclusion: Participants in OTAGO report improvements in exercise participation, strength and stamina. These improvements may well contribute to the reduction in self-reported falls since starting OTAGO. Keywords: Otago Programme; Strength, Balance; Fear of Falling; Falls Prevention.

Implementation of the Living Longer Living Stronger community strength training program into a residential care environment

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Living Longer Living Stronger TM (LLLS) is an evidence based strength-training program that encourages and supports change in the health and fitness sectors to achieve improved health, quality of life and fitness for people aged over 50 years. The program is currently funded by the Western Australian State Department of Health in the area of falls prevention. This project aimed to identify the benefits and feasibility of delivering Living Longer Living Stronger (LLLS) within the environment of an aged care facility for residents who reside in a residential care environment, together with community residents, as historically the LLLS program had only been delivered in a general community environment in local gyms, recreation centers, physiotherapy practices and exercise physiology clinics. A partnership with Freemasons Western Australia was formed in June 2009 and planning began on a 12-week pilot program which eventually commenced in June 2010. Unlike the community LLLS program existing physiotherapy assistant (PTA) staff were recruited and provided with basic fitness leader training to ensure they were capable of leading and supervising basics exercise sessions. Clinical testing and qualitative assessments were completed pre and post pilot project and results showed drastic improvements across the board with 91% improving balance measures (Berg Balance), 82% improving flexibility, 55% improving leg strength and power and 45% improving cardiovascular function in only 12 weeks. Participants and staff reported improved mood, sleeping habits, energy and posture and the improved social engagement between participants from a residential setting and high care setting were noticeable. This innovation in care provided specialized strength and physical conditioning services to those most in need and has been recognized and further more funded into the future by the Western Australian State Department of Health. Keywords: Life Expectancy; Strength, Balance; Environment; Residential Care.

“PLEASE, DON’T FALL” COMMUNITY RESEARCH-ACTION PROJECT: AN AZOREAN REPORT

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Introduction: Por favor não caia” (Please don’t fall) is a community research-action project developed in the field of health promotion directed toward the aging population. It was implemented by an interdisciplinary team (Managers, Physiotherapists, Nurses, and Nutritionists) between October 2010 and August 2011 in Angra do Heroísmo (Island Terceira) and Santa Cruz da Graciosa (Island Graciosa). Counting with more than 1000 participants it was the biggest project of its kind ever to take place in the Azores (Portugal). This practical implementation report describes the objective results of the Physiotherapy team intervention. 

Aim: The aim of this research-action study was to explore the effects of a community-based physical exercise program on the balance, falls efficacy, and functional mobility of sedentary aging adults.

Methods: 149 participants(146F, ±70 years;3M, ±80 years) met the inclusion criteria and went through a low impact physical exercise program (45 min classes, twice a week, during 40 weeks). All were assessed (baseline and end of the program) using the Timed up and go (TUG) test, Modified Falls Efficacy Scale (MFES), and Footscan platform. Non-parametrical statistical tests were used to analyze the data. Results: The TUG score improved between the two assessments (p = 0,000), so did the MFES score (p = 0,000). The objective balance, measured with foot scan, also improved (p = 0,001). A greater adherence to the program was statistically associated to these improvements (rho = -4,96). Conclusions: The physical exercise program seems to have contributed to the improvement of the balance, falls efficacy, and functional mobility of the participants. These positive results have decisively contributed to the renewal of the official government support to this project in 2012. It has also played an important role on highlighting the importance of investing in preventive measures to lower the public health burden associated to demographical aging in the Azores.

ASSESSMENT OF FALLS RISKS

Biomechanics of Locomotion in the Elderly Project: Procedures and determinant factors for falls in Portuguese older people

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Background: The “Biomechanics of locomotion in the elderly” is a research program conducted by Neuromechanics Research Group from CIPER-FMH/UTL (supported by the Portuguese Foundation for Science and Technology) that aims to develop a risk profile to identify Portuguese community-residing elderly at high risk of falling and to develop recommendations on the development of exercise programs aimed at reducing the risk of falls in this population. Aims: This study intends to describe the baseline processes followed on the aforementioned project by: (1) present preliminary results about the validation of the procedures (physical activity (PA) and functional fitness (FF) tests followed, (2) identify the parameters which are determinant to predict falls in Portuguese older adults. Methods: 647 subjects, aged ≥65y, were randomly recruited in Lisbon and Tagus Valley area. Trained interviewers administered: (1) a standardized questionnaire that included sociodemographic, health perception and falls parameters (prevalence, circumstances and consequences); (2) YPAS PA questionnaire and (3) FF tests (30sec Chair-Stand and 8 foot Up & Go from SFT battery and items 4-7 from FAB Scale). Logistic regression analysis was used to model fall occurrence considering three different fall groups (non-fallers (NF 0 falls), fallers (F 1 fall) and recurrent fallers (RF 2 fall). Results/Conclusion: All tests showed very good validity and reproducibility, giving us confidence about the results obtained. Health and FF variables

Predictors of falls and fractures as women age past the menopause

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Background: Fall related fractures are a major problem for women as they age. Preventing falls is the goal of fall prevention interventions among known fallers. There is little evidence to support fall screening and intervention for younger women. This study aimed to identify potentially modifiable health-related factors predicting falls and fracture in women over 40.

Method: 449 women aged 40 to 80 years from the Longitudinal Assessment of Women (LAW) study participated. Demographic information (age, BMI, Medications, medical conditions and activity level, balance assessment including Timed Up & Go and modified Clinical Test for Sensory Interaction of Balance and measurements of bone mineral density and body composition were collected in 2001 as baseline, follow-up data on Falls and fracture data were conducted regularly until 2010 to determine incidence. Results: Multinomial logistic regression revealed that single falls could be predicted by a history of previous falls (OR 3.08) and being unsteady in bipedal stance on foam with eyes closed (OR 1.99). Multiple falls were predicted by a history of falls at baseline (OR 4.69), low levels of activity (OR 2.17), greater number of medical conditions (OR 1.12) and being unsteady in bipedal stance on foam with eyes close (OR 4.21). Low bone mineral density (OR 3.13), greater number of medical conditions (OR 1.32) and a history of falls (OR 3.04) were predictive of fractures.

Conclusions: This study showed that a significant proportion of falls occurs in women in their 40s and 50s. Poor health, decreased balance and inactivity are predictive of falls and low bone mineral density, low activity level and poor health predictive of fractures. Failing the balance test, bipedal stance on foam with eyes closed in the presence of low activity and poor health is a valid quick screening tool for detecting potential fallers for referral for in-depth balance assessment and intervention. Keywords: Fall Predictions; Longitudinal Assessment; Demographics; Balance; Bone Health.

Can the Short Physical Performance Battery predict outcomes in very old age? 9 year data from 90 over-90-year-olds in the population-based CC75C Study

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Background: The Short Physical Performance Battery (SPPB; Guralnik 1994) comprises gait speed; chair stands and balance tests that together give well-validated risk estimates for a range of adverse outcomes. Although widely used in ageing research and practice, its use in very old age is reported rarely and usually only in care homes. We report norms for the oldest old from a population-based sample and explore whether the SPPB can be a useful predictor in this age group. Methods: Men and women aged at least 75 enrolled in Cambridge City over-75s Cohort (CC75C) study via general practices 25 years ago. All surviving participants were aged over 90 when re-interviewed for the CC75C falls study (n
Of these \( n = 90 \) completed SPPB assessments. All were followed-up with intensive prospective falls data collection with fall calendars, phone calls and visits. Hospital admissions were also monitored during this year. Moves into long-term care and deaths have been tracked ever since, giving 9.6 years follow-up 31 January 2012. **Results:** SPPB scores (scale 0-12) are skewed to lower scores: median 3, IQR 1-5. Tertiles give groups scoring 0-1, 2-4 and 5-10. Kaplan-Meier plots and Cox proportional hazard ratios show relative to highest SPPB group, mortality curves decline fastest with lowest scores: HR1.9 (95% C.I. 1.1-3.2) and 2.8 (1.5-5.0) in 2nd and 3rd group respectively. Both lower score tertiles have similarly increased risk of moving into care: HR3.2 (1.4-7.2) and 2.9 (1.1-7.3) but the middle group has shorter time than the lowest SPPB group both to hospital admissions: HR10.4 (2.4-44.9) vs 6.9 (1.4-34.0) and to falls: HR2.7 (1.4-5.5) vs 1.3 (0.5-2.9). HRs are adjusted for dementia; demographic confounders had minimal effect. **Conclusion:** Findings show SPPB groups identify different survival time trajectories (death, long-term care admission, hospitalisation, first fall), suggesting particular risk for older people with low but not the lowest functional ability. **Keywords:** Falls Calendar; Hospital Admissions; Functional Ability; Population Based Study.

**Balance and fall risk in community-dwelling older adults from Madeira, Portugal**

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**Background:** Numerous age-related changes in function, including balance declines, are associated to frailty in older adults and increased risk of falling. **Aims:** The present study aimed (1) to determine the prevalence of falls in community-dwelling older adults from Madeira, Portugal, (2) to identify the levels of balance/risk for falling, and (3) to determine the extent to which balance scores are associated with lifestyle and constitutive factors. **Methods:** This cross-sectional study included 127 subjects, 12 males and 115 females, aged 63-88 years, engaging in a balance program developed in Madeira (ProBalance). Balance was assessed using the Fullerton Advanced Balance (FAB) scale. Demographic information and health history were obtained using a modified version of the FallProof Program’s questionnaire through a face-to-face interview. Cognitive function was assessed by the Mini-Mental State Test. Statistical analysis included descriptive statistics and multiple regression analysis (MRA). **Results:** The prevalence of falls, in the previous year, was 53.5%. From the total sample, 42.5% of the participants were identified as having increased risk for falling (FAB scores 25 or lower) and 57.5% presented a low-to-moderate risk for falling (FAB scores higher than 25). Mobility problems \((R^2 = -0.239; P = 0.029)\), number of medications \((R^2 = -0.300; P = 0.006)\), physical activity \((R^2 = 0.229; P = 0.033)\), and cognitive function \((R^2 = 0.262; P = 0.017)\) were the predictors of FAB scores. As a whole, these variables explained 28% of the variance of the FAB score. **Conclusions:** This study identified high prevalence of Portuguese fallers and older adults with increase risk for falling. Mobility problems, number of medications, physical activity and cognitive function explained about one third of the variance on FAB score. **Keywords:** Prevalence of Falls; Risk of Falling; Medications; Physical Activity; Cognitive function.
Is cognitive performance associated with balance in adults with and without fibromyalgia?

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Background: Persons with fibromyalgia (FM) exhibit balance impairments and higher-than-expected fall risk. Fallers with FM exhibited altered cognitive function. Understanding relationships among cognition/balance may aid development of balance/mobility interventions. Purpose: to determine relationships between balance and cognitive performance accounting for participant factors in persons 50+ with/without FM. Methods: After dementia screening, 115 participants were assessed for depression, symptoms, physical activity, Fullerton Advanced Balance (FAB) scale, and cognitive measures Stroop Color, Stroop Color/Word, Auditory Consonant Trigram (attention/executive function), Trails B minus A (inhibition), Digits Span F+B working memory), Digit Symbol Substitution,(DSST, processing speed), and Everyday Problems Test (EPT, problem solving). Separate hierarchical regression analyses with each cognitive measure (where a significant bivariate correlation with balance was found) were run to determine the relationships between cognitive performance and balance (total FAB score) taking into account the participant factors found to be significantly associated with balance. Results: Better balance was significantly associated with younger age, higher activity, less depression but not with gender, or having frequent falls, FM, neurological condition, numbness/tingling, or vision problems. Using only cognitive measures with significant correlations with balance, regression models predicted 35-41% of balance variance with independent contributions from age, activity, depression. No cognitive measure contributed to balance variance (p > .05). Conclusions: Having FM was not associated with balance. In multivariate models, cognitive measures did not contribute independently to balance while participant factors (age, activity level, depression) did. Further studies are needed to determine if cognitive measures offer significant contributions to individual balance dimensions. Keywords: Fibromyalgia; Balance Impairments; Cognitive Function; Mobility.

Can functional fitness and balance battery tests discriminate fallers in a group of active elderly?

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Background and Purpose: The aging process leads to a decline in functional fitness (FF) increasing falls prevalence in elderly. Decreased postural stability, strength and power in lower limbs are intrinsic predictors of such accidents1. On the contrary, exercise programs may improve Functional Fitness (FF) and prevent falls among this population. The purpose of this study was to verify which items of a FF and Balance (B) battery tests could be better to discriminate fallers in a group of active elderly. Subjects and Methods: 629 active (exercise practice ×2 times a week, ~45 min/session) older adults (72.5±5.3y) participated in this study. Trained examiners administered: 1) a fall questionnaire designed for this purpose; and 2) a FF and B battery test that included the UG, CS and 2min Step tests from SFT2, items 4-7 of FAB Scale3, and Calf Raise and Calf Stretch tests (in validation process) to assess ankle
strength and flexibility. A Logistic regression analysis (backward conditional) was used to determine the risk factors for fall in different groups: non-fallers (0 falls), fallers (1 fall) and recurrent fallers (>1 fall). **Results and Discussion:** In a bivariate logistic analysis, all FF and B tests have shown to be determinant for recurrent falling. However, multifactorial analysis revealed that only cardiorespiratory fitness (2-min Step) and, above all, dynamic balance (FAB5), were shown to be protective factors for recurrent falls (OR = 0.976; 95%CI 0.959-0.995). Moreover, the only variable that explained the episodic falls was static balance (FAB 6), also as a protective factor (OR = 0.847; 95%CI 0.728-0.986). **Conclusion:** In this battery of tests, balance assessments seem to be the key element to discriminate fallers in a group of active elderly. **References:** 1. Skelton, D.A. (2001). Age and Ageing, 30; 2. Jones, C.J. (1999). Res Q Exerc Sport, 70; 3. Hernandez, D. (2008) Arch of Phys Med, 89. **Keywords:** Fitness and Balance; Strength, Flexibility; Postural Stability

**Seniors’ out-of-home trips and lower body strength**

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**Background:** Falls are an important cause of morbidity and mortality in older people. Lower body strength is strongly associated with older adults’ falls. Although abundant research has proved environmental characteristics to seniors subjective health perception, few studies have investigate the relationships between seniors motives for going out, environment use and objective measure of lower body strength. **Purpose:** To investigate the relationship between seniors neighbourhood out-of-home mobility and objective measure of lower body strength. **Methods:** 445 community dwelling older adults (age = 75.13 ± 6.54 yrs) were recruited for this study. Neighbourhood environment and seniors out-of-home mobility was measured by the questionnaire which includes their motives and the frequencies for going out, the destinations and the distances for their daily physical activity participation, the transportation methods adopted associated with seniors’ out-of-home trips. All participants were instructed to perform chair stand test (mean: 13.66 ± 5.00) to assess their lower body strength. **Results:** Regression analysis was performed adjusted for age and gender. Seniors who go out for exercise at least once a day was a significant predictor of lower body strength (β = 0.135, p < .05). Park accessibility within 10 min transportation time was also a significant predictor of lower body strength (β = 0.153, p < .05). **Conclusion:** The frequencies of seniors’ out-of-home trips and shorter travelling time to park are stronger predictors of seniors’ objective measure of lower extremity function. The results provide implications for increasing seniors lower body strength from neighbourhood accessibility perspective which may assist the prevention of older adults falls. **Keywords:** Morbidity and Mortality; Falls; Strength.

**FEAR OF FALLING, PHYSICAL ACTIVITY AND FALLS IN OLDER PEOPLE**

Falls efficacy, executive function and functional performance in community dwelling older adults

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**Introduction:** Concern about falling and poor executive function cause deterioration in gait performance in older adults. The relationship between fear and gait and between execu-
tive function and gait has been established. However, the relationship between concern about falling and executive function requires further investigation. **Methods:** Ninety-three community-dwelling adults aged 65 years and older were assessed on the Falls Efficacy Scale-International (FES-I), the abbreviated Executive Interview (EXIT-15) and on functional tests including a 10 meter walk and the Timed Up & Go (TUG) test. The correlation between these variables was assessed using Spearman’s rho. The strength of correlation was determined based on small = 0.1-0.29, medium = 0.30-0.49 and large = 0.50-1.0. **Results:** Subjects had high concern about falling (FES-I median = 23, Inter-Quartile Range (IQR) = 13.5) and normal executive function (EXIT-15 median = 4, IQR = 3). Subjects required a median of 9.3 seconds (IQR = 4.9) to complete the 10 meter walk and a median of 11.8 seconds (IQR = 6) to complete the TUG test. There was a high correlation between FES-I and 10 meter walking and TUG time (rho = 0.61 and 0.64 respectively, \( p < 0.001 \)). EXIT-15 was also moderately correlated 10 meter walking and TUG time (rho = 0.49 and 0.48 respectively, \( p < 0.001 \)). FES-I and EXIT-15 were moderately correlated (rho = 0.41, \( p < 0.001 \)). **Conclusion:** The results of this study confirmed the previous findings regarding the effect of concern about falling and executive function on walking performance, as greater concern and poorer executive function were related to longer walking and TUG performance. Despite the EXIT-15 scores being within the normal range, poorer EXIT-15 scores were related to greater concern about falling. This relationship might indicate that executive function has an impact on perceived concern or fear of falling. It also suggests that concern about falling is not just a simple measure of efficacy it can also be an indicator of the ability of older adults to plan and carry out goal directed behaviour. **Keywords:** Falls Efficacy; Executive Function; Functional Performance.

The relationship of physical activity to falls incidence in community-dwelling older adults: A review

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**Background:** Evidence supports participation in structured exercise programmes to reduce falls incidence among older adults. However, the influence of habitual physical activity (PA) on falls is not well understood. **Aims:** This study aims to synthesise the current evidence on PA and its relationship to falls incidence among community-dwelling older adults. **Methods:** Observational studies were sourced by searching the PubMed, Academic Search Complete, AMED, Biomedical Reference Collection, CINAHL, MEDLINE, Nursing and Allied Health Collection, SPORTDiscus and Cochrane databases with the key words ‘falls’, ‘physical activity’, ‘community’ and either ‘older adults’ or ‘elderly’, and via reference lists of relevant articles. Articles were excluded if they were not in English, did not measure PA and falls incidence, related to disease-specific populations only or populations other than community-dwelling adults of 60 years or over. **Results:** 23 papers dating from 1996 to 2011 were reviewed. Falls incidence was recorded retrospectively in 11 studies and prospectively in 12. Only 2 studies measured PA objectively. **Discussion:** Mixed evidence was found linking both high and low PA levels to falls incidence retrospectively and prospectively. However, a consistent U-shaped relationship between PA and falls was not observed. Evidence suggests that factors relating to the person (physical performance capacity), task (the type and amount of PA undertaken) and environment (environmental demands) may mediate the relationship between habitual PA and falls incidence among older adults. Considerable heterogeneity across studies was noted in falls reporting and PA measurement methods. **Conclusions:**
Personal, environmental and task-related factors appear to influence PA and falls incidence in this population. Future research using objective PA measures should consider these factors to determine their relative contributions and improve our understanding of how falls and PA are related. **Keywords:** Physical Activity; Falls Incidence; Measurement of Physical Activity; Environment.

**Fear of falling: Can technology eliminate it?**
Beckett, William

*Hip Impact Protection Ltd, United Kingdom*

The fear of falling is a well-established phenomenon amongst the elderly population with ample proof provided by the statistical drop in fractures of the hip during periods of severe weather, when exactly the opposite outcome would have been expected. Elderly people, many of whom will already have experienced a fall, tend to remain in their homes while such conditions persist in order to avoid the risk of a fall on slippery pavements or roads. The deleterious effects of such constricted movement include social isolation as well as some physical degeneration through lack of exercise. Within the home or care institution, special flooring, akin to that installed in children’s playrooms, can be provided, though it is not inexpensive and is hardly a decorative feature; outside the home, it is a different matter. The requirement is, therefore, for a medical device that protects individuals in the event of a fall, without requiring them to wear the equivalent of body armour. Hip protectors have been available in various guises since the early 2000s, however they have hitherto suffered from a number of drawbacks. These include minimal reduction in transmitted force, significant discomfort for the wearer through being too hot, too hard and/or too bulky to wear, as well as being too expensive. A new generation of hip protectors, as well as knee, shoulder and head protectors, is now available with non-Newtonian properties, and can provide proper protection with complete comfort, even in bed at night (a time when many falls occur) but at reasonable cost. The protectors use a remarkable new material called D3O whose molecules normally flow like a liquid but lock instantly on impact, relaxing thereafter. This material reduces an impact of 3,500 kNewtons, experienced at a hip in a fall, to approximately 1,000 kN, sufficient to prevent fracture in even an osteoporotic hip. This is between 30% and 50% better than any other hip protector. It is called Fall-Safe®. **Keywords:** Fear of Falling; Technology; Fractures; Falls Prevention.

**How is objectively measured physical activity associated with falls and fear of falling in older community dwelling men?**

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**Aims:** We study associations between objectively measured physical activity (PA) levels and falls and fear of falling (FOF) in community-dwelling older adults, as this is little studied. **Methods:** Men participating in a prospective, population-based cohort study in 24 British towns reported if they had fallen in the previous year and if they were fearful of falling. Men wore an Actigraph GT3X accelerometer over the hip for 7 days. Data were analysed in 60s epochs. **Results:** 1543 men with a mean age of 77(range 71-91y) wore the Actigraph,
1100 (72%) had >600 min wear time on 5-7 days (excluding bouts of >60 min of continuous zeros) and questionnaire data. 21% (n = 229) had fallen, 30% (n = 68) received medical attention. Men who fell took fewer steps/day than men who did not: mean difference (adjusted for age, day order, month, wear time and town) -504 (95%CI -216, -792) and spent more min sedentary 13(95%CI 4, 22), and less in light -10(95%CI -1, -19) and moderate to vigorous PA (MVPA) -3.5(95%CI -1.3, -5.8). In relative terms, the reduction in MVPA was greatest: 22% (95%CI 7, 37). Differences were explained by exercise self-efficacy and mobility limitations, but not by exercise outcome expectation. 13% (n = 141) men reported FOF, of which 53% (n = 74) had fallen in the past year. Men with FOF took fewer steps: -1325(95%CI -1646, -1005), spent more min in sedentary 29(95% CI 18, 40), and less in light activity -21(95%CI -32, -11) or MVPA -9(95%CI -11, -7). In relative terms, the reduction in MVPA was greatest: -72%(95%CI -93, -52). Differences were partly explained by exercise self-efficacy, mobility limitations, and to a lesser extent, exercise outcome expectation. There was no evidence that FOF had a greater impact on PA levels among men who had fallen compared to those who had not fallen. Conclusions: PA levels and in particular step counts and MVPA levels, were lower among men who had fallen in the past year, and even more markedly, among those who reported FOF. Keywords: Measurement of Physical Activity; Falls and Fear of Falling; Accelerometer.

Functional fitness protects the elderly from fear of falling

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Background: Fear of falling (FoF) is a common and potentially disabling problem among the elderly. It often results in a reduction of their activity, leading to a downward spiral, accelerating physical deconditioning and reducing social interaction. Aims: The purpose of this study was to determine factors underlying FoF and their consequences. Methods: A cross-sectional study was designed to determine factors that enhance FoF and the implications of this phobia in ADLs among 1084 Portuguese older adults (70.04±6.89 yrs; 79.9% women). FoF, Perception of Health (PH) and Fall Prevalence (FP) were assessed by a specific questionnaire. Physical Activity was calculated through YPAS1. Functional Fitness (FF) was evaluated by UG and CS tests from SFT2, and balance obtained through “item 4, 5, 6 and 7” of FAB3 Scale. Chi-Square and T’student test were done to identify differences among gender, age, FoF and how it affects the ADLs. Logistic regression analyzes (backward conditional) were performed to identify the determinant factors for FoF and ADLs avoidance. Results: FoF was reported by 53.9% subjects and associated avoidance of ADLs by 22.1%. Concerning FoF outcome, having a good score balance is a protective factor (OR = 0.911;95%CI 0.844-0.983) while being a woman (OR = 2.801;95%CI 1.635-4.799), poor hearing (OR = 1.709;95%CI 1.126-2.595), poor agility (OR = 1.229;95%CI 1.037-1.456) and FP (OR = 1.425;95%CI 1.122-1.808) are risk factors. Poor vision increases the ADLs avoidance (OR = 1.941;95%CI 1.196-3.151) while good balance (OR = 0.890;95%CI 0.831-0.953) enable them. The stratified analysis by gender showed that FoF in women is enhanced by poor perception of visual health (OR = 1.999;95%CI1.220-3.276), and by FP (OR = 0.900;95%CI0.839-0.966); again good balance is a protector. Conclusion: Having good FF, especially good balance is an effective way to protect elderly from the FoF and consequently the avoidance of ADLs. References: [1] Dipietro, et al (1993) MSSE 25(5), 628-642 ;[2] Rikli & Jones. Keywords: Fear of Falling; Balance; Physical Activity; Functional Fitness.
Dual task balance training in fall prevention of older adults

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Changes in DT performance and an increased fall risk in older adults have been shown in frail older adults or adults with a history of falls (Siu et al., 2008). Fallers performed more inefficient in DT situations, indicating that they have problems to shift attention, to prioritize gait (Springer et al., 2006) or balance control. It has been shown that motor (balance or strength) or cognitive training can improve older adults’ DT performance (Piechierri et al., 2011). According to the inability of fallers to shift attention an intervention should include task prioritization and task switching elements to build up strategies for balance performance in DT situations. This RCT compared DT balance training with strength training to analyse if DT training will be 40 seniors were randomized into a DT balance training (n = 15.72.1 ± 5.2 y), a strength training (n = 13, 73 ± 5.8 y) and a control group (n = 12,70,2 ± 5,2 y). The programme started at January for 12 weeks. Questionnaires examined daily activities and fear of falling (FES-I). Data of balance were collected (pre-post and measurement after 6 weeks of training) with the short physical performance battery (SPPB), sit to stand transfer (SST) on a Kistler forceplate (power and time to stabilization), sway velocity while standing on a forceplate under single and DT conditions (Stroop-test; standing on foam) and walking on a Zebris treadmill (FDM-T,3,5 km/h) under single and DT conditions (obstacle avoidance; Stroop test). Force data were collected at 100 Hz. DT-costs will be calculated. There were no groups differences for the SPPB (DT training: 11.3 ± 0.9, strength training : 11,4 ± 0.6, 70.2 ± 5.2, control: 11,8 ± 5.2). The values of the SPPB showed a high fitness level of the included persons. We suppose the strength training will improve balance performance during the SST and while standing, whereas the DT training will improve balance under DT standing and walking conditions. All results will be analysed until June. Keywords: Dual Task; Balance Training; Falls Prevention; Falls Risk.

An evaluation of a falls prevention exercise pilot in Bradford

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Bradford District Care Trust, UK.

Background: Funding from the “Extra Time Project” (Football Foundation and Comic Relief) to run two 20-week courses. All sessions were led by 2 Postural Stability Instructors. Assessments completed: Home visits pre assessment, FRAT, Confidence in Maintaining Balance, Black Fracture Risk Assessment, Short FES-I Questionnaire Quality of Life Questionnaire, Functional Test – Tinetti. Results: 8 people completed the 20 week Falls Prevention Classes at The Ridge Medical Practice in 2011. Average Improvements: Sit to stand 1.75 (in 30 seconds); Timed up and go 12.4 sec (quicker at post than at pre); Upper body flexibility Average of 10.5cm more flexible; Lower body flexibility Average of 5.5cm more flexible; 360 degree turn Patients required an average of 2.6 less steps to complete the 360 degree turn; Standing balance (timed one foot in front of other not holding on) Right in front of left – 9.1 sec longer Left in front of right – 8.4secs longer; Anxiety fear of falling Patients on average 20% less anxious of falling; Environmental risk factors - The Westmead Home Safety Assessment (WeHSA) was 14 risk factors were identified. All patients have written plans 2 patients referred to Age Concern to have hand rails fitted 2 patients decided to uptake “Careline” for pendant and phone connection in case of fall or emergency. 4 walking aids were found to be defective, new ferules put on Summary (QUIPP analysis). Conclu-
sessions: Quality - Measurable outcomes have been achieved in line with current policy and best practice. Innovation - An evidenced based approach incorporating home assessments, tailored exercise classes, post assessments and action plans. Productivity - A low cost and efficient intervention. Prevention - Preventing frailty, promoting bone health and reducing accidents. Keywords: Falls Prevention; Costs; Walking; Environment.

COMMUNITY WIDE PROGRAMMES

A comprehensive falls screening and intervention program among adults in the community setting

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Silver Chain Group, Australia.

Falls in adults over the age of 65 are a common event with one in three older Australians expected to fall each year (Hendrie et al., 2004). The consequences for the older person can be significant, with many experiencing a subsequent decline in functioning and quality of life. The impact on the health system can also be considerable, accounting for 4% of hospital admissions in Western Australia for people aged over 65 (unpublished data, WA Health Dept.). Despite the evidence that falls are very common, falls in community dwelling adults often go unreported and subsequently falls management programs are not implemented. This is not surprising however as many older adults do not believe they are at risk of falling and therefore ignore the falls prevention messages and programs that are available. It is also interesting that health care providers often under-detect falls, with known falls often receiving inadequate evaluation and intervention to treat the cause of the falls (Rubenstein et al., 2004). With this in mind, Silver Chain Group identified a need to develop and implement a broad-based comprehensive falls screening program for all clients entering the organisations services. The screening program implemented at the commencement of services focuses on engaging clients in a proactive, wellness approach to their own falls risk and leads into an intervention program for those identified as being at risk of falls. This presentation will outline the screening tool developed for use by all levels of staff, the use of mobile technology to record assessment and report incidence and impact of falls, as well as the training developed for staff working with community dwelling adults. An outline of the interventions identified and integration into existing falls prevention programs will be included, as well as some preliminary outcome based results from the program. Keywords: Falls Screening; Quality of Life; Health; Hospital Admissions.

A community based approach to promote active ageing in Staffordshire

Wealleans, Lynne; Brammar, June

Beth Johnson Foundation, UK.

The Beth Johnson Foundation has developed a community based cascade model to improve the health and wellbeing of older people in Staffordshire by recruiting and training volunteers as peer health mentors primarily to deliver gentle exercise programmes and updated health messages. A recent impact assessment shows that as well as improving general health and well-being, the wider benefits to participants of getting involved in the groups also include building social networks and reducing loneliness and isolation with their consequent negative effects on quality of life. To take a preventative approach to falls, volunteer peer health mentors have also been trained in falls awareness to encourage the older people in their groups to take measures to reduce their risk of falling. Overall the Active in Age programme
is aimed at providing the information and support needed by older people for them to make informed choices about maintaining or improving their own health and well-being and quality of life as they are ageing. **Keywords:** Active Ageing; Wellbeing; Quality of Life; Social Networks; Falls Awareness.

“**Upright and Able**: A community-based approach to falls prevention and active living

Grant, Bevan C

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**Introduction:** Translating the empirical data about the many factors associated with falls into a sustainable community-based program with limited resources is a challenge. This is accentuated knowing the desire to engage in physical activity decreases with age, and public health funding for such ventures is limited in spite of the personal, social and economic benefits. Nonetheless, measures should be taken to mitigate the risk of falling in later life. This paper reports on the day-to-day experiences when offering a self-managed falls prevention program in rural communities of New Zealand. **Methods:** Groups of adults (n = 197) ranging in age from 56 to 93 years (xc = 77 years) who satisfied the ‘high risk of falling’ criteria were invited to participate in a six-week community-based physical activity and educational program. Data included falls history, scores for the Four Test Balance Scale and Chair Stand Test in Week 1 and 6, and a follow-up telephone interview after 3 and 6 months on their progress, perceptions of the program and other changes in health status. **Results:** Half of the participants had fallen prior to commencing the program but this reduced to 16% (only four sustained injuries) after sixth months. Furthermore, 90% self-reported feeling more confident in their physical ability, regularly engaged in a range of self-chosen physical activities of mostly mild intensity, were more knowledgeable about falls, and claimed to have a better quality of life. There were some concerns about the availability of suitable staff in these communities to provide on-going support for this cohort. **Conclusions:** The findings indicate positive outcomes and reflect those reported in the literature but the process warrants further refinement. In essence, this means continuing to explore how best to translate the research into the everyday practice in multi-purpose community recreation programs, and ultimately the lives of greater numbers of older people. **Keywords:** Rural; Risk of Falling; Physical Activity; Balance; Falls History.

**Fit as a fiddle: A lasting legacy for the health and wellbeing of older people**

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1*AgeUK, United Kingdom; 2Ecorys, United Kingdom*

“I can now brush my hair” epitomises the positive feedback from participants attending the Big Lottery Funded, five-year fit as a fiddle pilot programme hosted by AgeUK. The programme’s core outcomes include engaging older people throughout England into healthy eating, physical, social and mental wellbeing activities through local and national partnership working, promoting the voices and views of people in later life. Externally evaluated interim findings demonstrate fit as a fiddle’s effective approach to activity; 300,000+ older people have engaged, increased levels of physical activity e.g. 33% increase in the amount of walking, and 71% increase in min spent undertaking strength and balance exercises. Fit as a fiddle has been successful in reaching socially marginalised older people. 13% of participants engaged were from BME and faith communities, 6636 older men were engaged and 25% of participants were aged 80 and above. “It beats staring at 4 walls all day.” Engaging new
older volunteers has been a key outcome from fit as a fiddle. Currently 3500 older people have become fit as a fiddle volunteers, and this is an integral feature of the programme’s success. Every role, from befriending to Zumba instructing, have been vital. This innovative, committed and locally driven programme has delivered huge impacts on older people’s health and wellbeing. Developed new, innovative resources and approaches to participation and activity, and especially to those at most need. This is an opportune moment to share and discuss fit as a fiddle’s lessons, learning and legacy with the world. **Keywords:** Mental Wellbeing; Health; Fit as a Fiddle; Innovation; AgeUK.

**Being active—Staying safe**

Castell, Sally

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People 85+ are some of the most vulnerable members of society and are the fastest growing segment of the population. Frailty with associated decreased functional abilities can isolate people. Being Active - Staying Safe was a project undertaken by 2 councils working alongside Northern Sydney Health Promotion. The target group was the isolated, cognitively intact, frailer aged, living at home, identified as having high falls risks. Lack of an appropriate exercise program, problems of access, lack of transport and costs were factors also identified. Venues were found, transport provided and a program delivered bringing people together to exercise and socialise. 82 people were recruited in 7 sessions with a maximum of 12 people per group. The mean age was 80+ and 90% female. Participants were assessed at the beginning and end of the program. 57 participants completed the program and undertook assessments. Measures taken were the Quick screen; FES; QOL; transport and attendee numbers; falls and medical history. Volunteers were recruited and trained to assist where needed. The program comprised of two 8-week sessions with a 4-week home program break between sessions. The first 8 weeks consisted of progressive strengthening training, balance, co-ordination and reaction time exercises to challenge physical and cognitive processes. The last 8 weeks built on the basics improving functional abilities and confidence levels as far as possible. The exercises were based from the Staying Active Staying Safe DVD and used for the home program. Relevant information concerning falls risk factors were included in the sessions Physical abilities improved and falls risk factors reduced but the FES and QOL did not. It was observed that participants “opened up” and became more sociable during the program. Transport was a crucial element of the intervention to enable people attend the sessions. **Keywords:** Ageing Population; Falls and Medical History; Intervention; Exercise.

**Enabling independence: The impact of a whole systems approach to re-enablement in South Ayrshire**

*Sergeant, Elizabeth V; Kerr, Kirstin; Kelly, Steven*

*South Ayrshire Council, UK.*

Emerging data indicates that the impact of re-ablement ensures increased levels of independence, supporting people to remain within their own homes and communities, in many cases with medium to longer term reduced levels of support. To maximise the benefits of such an approach re-ablement must not be seen in isolation, rather be developed in the context of a continuum of support through a whole systems approach in design and implementation. In South Ayrshire, the process of designing the “enablement” programme has been preceded by remodelling of Care at Home services. There has been a fundamental shift from high levels
of in-house provision towards greater use of services provided through the independent and voluntary sectors, whilst in-house provision has been tailored to meeting the demands of enablement and support of those with complex social and healthcare needs. The relationship between health, social care services and service providers is crucial to meeting individual need regardless of whether this is from acute, chronic, complex or progressive illness. To ensure greater flexibility in enabling choice in the continuum of enablement and self-directed support options, as part of the reshaping of care for older people, an environment which supports ease of financial environment is essential. Within this context, South Ayrshire Council and partners are working closely with the independent and voluntary sectors. Traditionally providers have been responsible for determining and purchasing their own training, in line with service requirements. However to achieve a consistent and effective service provision, partners have invested in a programme of joint training across all stakeholder groups, to ensure a whole systems approach to service redesign. Enablement and ongoing support needs, an individual may have, requires focusing on individual outcomes and maximisation of skills to support independence, regardless of who provides the support systems. **Keywords:** Care Homes; Independence; Flexibility; Natural and Built Environment.

### Establishment of the Perth & Kinross Care Home Activity Network

*Wilson, Carolyn*¹; *McShea, Gillian*²

¹Perth Royal Infirmary, UK; ²Live Active Leisure, UK.

Established in 2010, the Perth & Kinross Care Home Activity Network (CHAN) supports local care homes to drive up their standards of care around the provision of meaningful activity. Meeting quarterly, the CHAN provides a forum for staff of the 25 care homes registered to network and share activity ideas/examples of best practice/resources and training. Those attending take the information back to their care home and share it with colleagues. By supporting each other the CHAN can ensure they are providing the best possible outcomes for residents. Between meetings, CHAN members communicate and an electronic forum is developed. All CHAN members have contributed to the planning structure including identifying its purpose and how to achieve it, compiling “commitment” forms with responsibilities and expectations, exploring communication channels both internally and externally and identifying training needs. This has ensured the CHAN is built on a solid foundation and maintains longer term sustainability. The CHAN’s ultimate aim is to benefit the physical and mental wellbeing of care home residents and improve their quality of life. Being engaged in meaningful activity promotes self worth and gives meaning, purpose and enjoyment to each day. The CHAN reinforces the personalised, individualised outcome approach for each and every resident and reinforces that meaningful activity is the responsibility of all care home staff and should happen all the time, everyday activities is meaningful activity. Through increasing activity potential, residents are naturally encouraged to increase their physical activity. A range of fun physical activities are promoted including chair-based exercise, indoor Kurling, the interactive Wii, walks and gardening. Care homes engaged in the CHAN now independently organise their own inter-care home competitive events and a large “Go4Gold” games challenge event is planned in Perth this year with 50 homes invited to participate. **Keywords:** Care Homes; Go4Gold; Walking; Activity Network.
FALLS AND PHYSICAL ACTIVITY IN DEVELOPING COUNTRIES AND MULTIPLE ETHNICITIES SYMPOSIA

Invited lecture: Functional capacity and falls research in the context of aging in developing countries

Johnson, Shanthi

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Falls are a major threat to the health of older adults. In addition, many older adults have compromised functional capacities marked by indicators such as mobility limitations associated with increased rates of falls. While it has been estimated that seventy% of the world’s older adults are and will be in developing countries, most of the research in the area of functional capacity and falls emerge from developed countries. As a result, considerable research gap exists in the context of developing countries. This presentation will highlight several conceptual and methodological challenges and opportunities for functional capacity and falls research through the analysis of publications in this area including the functional capacity, frailty, and falls studies in India. Specific attention will be paid to issues related to study design, sampling issues, definitions of constructs, measures, and data collection. Opportunities to promote culturally appropriate innovative research and to develop evidence-based health promotion strategies such as exercise program as well as falls prevention programs for older adults are discussed. Keywords: Falls; Mobility Limitations; Deprivation; Falls Research.

Aging attitudes are a predictor of physical activity among ethnically diverse older adults

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Physical activity levels have been shown to significantly influence functional autonomy and the risk of developing chronic conditions. Aging attitudes are also associated with both of these outcomes. Unfortunately, there is a lack of data available on the relationship between physical activity and aging attitudes. Purpose: To determine whether aging attitudes are a predictor of physical activity among an ethnically diverse group of older adults living in an urban center in Canada and to examine sex differences in this relation. Methods: Data from an ongoing intervention study were used for purposes of the current analysis. Participants were men (n = 30) and women (n = 136) between the ages of 55-85 who lived in low-income urban neighbourhoods in Toronto, Ontario. Upon recruitment to the study, all participants completed the Expectations Regarding Aging-12 (ERA) questionnaire, the Healthy Physical Activity Participation Questionnaire and provided demographic information. Linear regression analyses were performed using physical activity as the main outcome variable and ERA as the main exposure variable. Age, sex, marital status and education were controlled for in fully adjusted models. Results: Fully adjusted models accounted for 11% of the variance in the model that contained the overall sample, 17% in the model with males alone and 13% in the model with females alone. A significant (p < 0.05) and positive association between physical activity and ERA score (beta overall: 0.02; Males: 0.02; Females: 0.02) was found such that those reporting better aging attitudes had higher levels of physical activity. Conclusions: Better aging attitudes positively influence physical activity levels among ethnically diverse older adults. As such, aging attitudes should be targeted in interventions aiming to increase physical activity levels among older populations. Keywords: Ethnically Diverse Group, Urban; Sex; Aging Attitudes.
Does social participation matter for the elderly? An analysis of an aging community in Khuzistan province in Iran

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Increasing aged population (3.1%) compared with natural growth of Iranian population (1.2%) is a problematic issue. The literatures acclaim that physical disabilities and health problems in end life have significant relationship with social participation of aged. This study illustrates social participation in Iranian background, its factors and obstacles especially among aged. The scale of aged participation (SAP) constructed according to selected theories in 4 basic items and its 35 sub items. The community of the study is aged people in four selected cities of Khuzistan province/Iran: Ahwaz, Behbahan, Mah-Shahr, Dezful, and Abadan in 2010, and sampled 768 urban and rural elders. Findings have mentioned that social participation is low. It has significant relationship with burgess, high literacy, ethnicity, living with children, feminine, growth of welfare, having chronic disease of respiratory disorder, social alienation, cost of participation, reduction in benefits of participation, growth of their child’s income. Keywords: Physical Disabilities; Social Participation; Ethnicity; Respiratory Disorder.

Issues in Philippine aging population (with comparative notes on Japan)

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Introduction: In developing countries, like the Philippines, identifying present issues and problems among older persons (OPs) are of significance to better address their needs (specifically on physical activity promotion and leisure) and as bases for institutionalizing directions and strategies. Further, learning from the experiences of advanced countries like Japan could assist leaders on the nature and content of programs toward active aging.

Methods: Research situ was Sariaya Quezon (rural) and Quezon City (urban) with data gathered in 2009 on policies, activities and services (interview, ethnographic observations, visitations); leisure activities (questionnaire); functional fitness tests. Comparative notes on Japan applied similar methods (in 8 districts).

Results: As primary source of care is the home Filipino OPs generally engage in light PA around one’s abode with few communities providing for the leisure time needs of the OPs (generally social in nature due to lack of physical activity leaders). More involved in ADL the rural OPs have higher levels of functional fitness. Community services are centered on primary medical needs. Day cares and homes are available only to those who are financially independent. These and a dearth on information regarding different aspects of healthy lifestyle maintenance, limitations in active aging organizational process and structure in the Philippines are notable. In contrast, Japan (with its institutionalized policies and guidelines), varied programs and services to maintain and improve the quality of life of older persons in communities are realized.

Conclusion: Population aging demands a national policy that should specifically state in its service delivery the need to institutionalize leisure education and leadership towards active aging. A holistic OP program with basic benefits and services from medical to recreational needs, IEC campaign and a coalition of stakeholders (with PA specialists) is needed. Keywords: Rural; Urban; Philippines; Quality of Life; Active Aging.
Social support and health status in an elderly population in Tehran, Iran
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As Iran started to experience population ageing, it is of great significance to consider and address elderly people’s social needs and relationship, which might have direct impacts on their health and well-being. Little research has been conducted about the association of social support and health among elderly in Iran. Methods: This descriptive study was conducted to determine correlation of social support and elderly health. 180 elderly people were selected by a purposive sampling method. A questionnaire was used for data collection. This questionnaire included 3 parts: 1- socio-demographic characteristics; 2- social support scale; 3- Short Form-36(SF-36) Health Survey. Content and face validity was used in this questionnaire and reliability of the instrument was determined by internal consistency (j = 0.91) and test- retest method (r = 0.88) respectively. Results: Results showed that the highest and lowest aspects of the SF-36 were social function and physical function respectively. Most subjects (74.4%) had good health and just 4.4% of them had poor health. Both genders had good family support and the men had better friend and significant others support than women. Generally, there were significant correlations between social support and all of aspects of SF-36 and vitality was the highest aspect of health. Conclusion: Findings showed that having social support is associated with better health and well-being among older adults. Understanding how social support may influence the health and well-being of older adult can benefit health professionals by informing intervention efforts to enhance social relationships, thus improving on current strategies that have focused on increasing support availability. Keywords: Social Support; Health; Wellbeing; Quality of Life.

Health services utilization and health practices among the older adults in India
Johnson, Shanthi
University of Regina, Canada.

The purpose of the study was to examine the patterns of health services utilization and health promotion practices of older adults in India. The Kerala Aging Survey, conducted among more than 5,000 elderly (2271 men and 2722 women) in 14 districts using population-based epidemiological design, was the keystone of the study. The survey had detailed modules on various determinants of health developed around the World Health Organization’s Determinants of Healthy Aging framework. The results of the Kerala ageing survey have shown that the age of participants ranged from 60 to over 100 years of age with 54% being women. The study showed that common health problems include: diabetes, heart disease, high blood pressure, and arthritis. In addition, falls and fractures were common. For medical needs, close to 40% accessed public hospitals and 56% used private hospitals. Most accessed public hospital for the free service provided whereas those who accessed private hospitals did so for the availability of better services, good care, and attention. In the study, only about 30% had routine medical check-up and over 80% were under regular medication. Health practices of the older adult population were also examined. Self-reported participation in physical
activity decreased with age. Approximately 60% of the young old (less the 70) participated in physical activities mostly in the form of household activities. Dietary patterns showed that most elderly consume three meals a day with a greater tendency for the older age groups to skip or miss meals. Also, the type of food changed from non-vegetarian to vegetarian as people aged and approximately 30% were on special diet such as diabetic diet or low salt diet. The results highlight the need for evidence-based programs and policies are needed to address the growing health needs and issues faced by the elderly in India. **Keywords:** Health Services Utilization; Health Promotion Practices; India.

## Practical Workshops

### YOGA FOR FALL PREVENTION

**Wertman, Annette**  
*Simon Fraser University, Canada.*

Yoga is under-valued as a fall prevention intervention for older adults with fall risk factors. The purpose of this session is to present Yoga as a unique option for older adults to engage in exercise activity (ACSM, 2003). Exercise has been established as an effective intervention for older adults to improve many fall risk factors, particularly musculoskeletal impairment implicated in balance impairment (Tatum et al., 2009; Morris, 2008). Yoga, defined by the American College of Sports Medicine (ACSM, 2003) as exercise, is easily adapted to aging populations and can reap the benefits gained by other types of exercise; increased muscular strength and endurance, muscle flexibility and functional ability in the form of increased ability to engage in activities of daily living (ADLs). Yoga may also be responsible for increased mood states, increased feelings of efficacy and personal control, and improved cognitive functioning, perhaps in the form of increased attention (Bethany-Bonura, 2007). Yoga may be considered a biopsychosocial intervention, successful at reducing multiple fall risks (Morris, 2008). Yoga benefits the whole body; slowing the aging process by increasing breathing capacity and improving the range of motion for muscles and joints, stretching the spine, lengthening ligaments and muscles, correcting posture, improving sleep quality and decreasing depression. The practice of yoga includes breathing techniques, meditation, asanas (physical poses) and progressive muscle relaxation. A more gentle form of yoga is catching on with older adults – Chair Yoga. The yoga mat is replaced by the chair, sometimes two. “The chair is there for safety,” she said. “As a result, I am encouraged to try things because I know I am not going to be hurt.” It is not possible to prevent all falls, but we can limit the number that happen. **Keywords:** Yoga; Fall Prevention; Fall Risk Factors; Muscular Strength; Wellbeing.

### OBTAINING THE BENEFITS OF TAI CHI PRACTICE THROUGH SINGLE POSTURE TAI CHI CHUAN (TCC) HEALTH AND FITNESS ROUTINES

**Pearl, Mirilee.**  
*Fitness for a Certain Age, UK.*

The effectiveness of TCC practice for falls prevention and improvement of balance and leg strength is well documented. Many people enjoy practicing TCC because it involves their mind and breathing as well as exercising their muscles. Barriers to TCC practice include that a reasonable level of fitness may be required to perform the sequences and learning
them may take a long time and can be a frustrating experience. These barriers can be overcome in a studio/class session delivering individual real TCC postures performed as drills or practice routines. This is an active workshop with two objectives: firstly, to clarify the underlying principles involved in effective TCC practice; and secondly to demonstrate a series of individual postures that can be taught in a group and enables participants to gain the benefits of TCC practice without learning long movement sequences. The method is based on practice routines trained by Wu style TCC practitioners to explore and improve the accuracy and energy work of each posture. All movement is low impact; some includes moderate cardiovascular exercise and breathing drills (qigong). Teaching stresses the importance of posture and employing conscious intention to execute complex movement, e.g. turns, and weight transfers. Adaptations and progressions will be shown (including seated work) to enable the exercises to be inclusive for a spectrum of fitness levels. By the end of the session, participants will learn the underlying principles of correct TCC practice and will be able to perform a series of individual postures suitable to incorporate in existing exercise classes. Learning principles of TCC exercise provides a valuable transferrable tool applicable to many western studio and individual exercise settings. Participants may leave the session feeling relaxed and refreshed. **Keywords:** Tai Chi; Cardiovascular Exercise; Health and Fitness; Relaxation.

**HOW TO GIVE EXERCISE ADVICE TO EVERYONE, AT ANY TIME: A CALL TO ACTION FOR HEALTH PROFESSIONALS EVERYWHERE!**

Gates, Ann

*Exercise Works!, UK.*

EVERY patient, EVERY CONSULT should involve exercise advice and support. The evidence for why ALL health professionals should do this is clear: each neighbourhood, community, clinic, hospital, city and nation is facing the biggest health epidemic from non-communicable diseases (NCDS) or ‘lifestyle’ diseases our health care systems have ever faced. Exercise advice consists of a simple discussion and direction with a patient, and/or their relatives and carers: ‘Regular exercise works extremely well in your disease condition ( ...insert: obesity, diabetes, heart disease, cancer, mental health, Parkinson’s disease, osteoporosis, fibromyalgia, peripheral arterial disease.... you get the idea!). I would like you to start an exercise programme that includes 30 min of cardiovascular exercise on at least five days of the week. Start with brisk walking for maybe 10 min each day. I also want you to try a series of fun, strength, flexibility and balance exercises. These have been shown to be more effective than many hospital appointments or referrals to other health care professionals (see http://www.youtube.com/watch?v = aUaInS6HiGo). Some GPs and MDs are actually showing Dr Mike Evans viral YouTube video at this point! ... But now the important bit! When I see you in a month’s time to review your medication, I am hoping that you will start to see an improvement in your health problem and overall health as a result of regular exercise. Here is a leaflet explaining some of the exercises I would like you to try’. EVERY health professional has the skills to ensure that the Chief Medical Officer or the Surgeon Generals advice for public health and health promotion on exercise within our communities is delivered and professionally ‘directed’. Exercise Works! have developed a variety of strategic and grass roots interventions that help health professionals and patients embrace the concept of ‘Exercise as a medicine’ and help promote excellence in delivering physical activity advice. The workshop will be an opportunity for attendees to share best practice and promote discussions around how we can do better on helping patients to exercise to health.
FALLS MANAGEMENT EXERCISE (FAME) AND THE OTAGO EXERCISE PROGRAMME

Gawler, Sheena; Done, Sheila
Later Life Training Ltd, UK.

There is good evidence that tailored, specific exercise can improve postural stability and reduce other risk factors for falls and injurious injuries including osteoporotic fracture. It is essential, therefore, that Primary Health Care Teams and Social Services, ideally placed to detect individuals with a risk or history of falling, recognise the benefits of, and promote referral into an appropriate exercise programme. FAME and Otago are both evidence based, published exercise programmes which have been specifically designed to improve postural stability and reduce the risk of falls. This session will give a brief overview of the evidence base and then take participants through the exercises and delivery of these exercises, including the tailoring of the exercises to suit individuals’ needs and preferences.

PNF-CHI®: THE ART OF BALANCE

Albuquerque, Eva1; Conde, Monserrat2; Araujo, Paulo1
1PNF-Chi, Portugal; 2PNF-Chi, School of Health -University of Algarve, Portugal.

The emergent global health needs lead to a change on the paradigm of health intervention. New concepts/techniques may provide a good way of addressing these issues. Pnf-Chi® is a global approach to physical exercise. It is a low impact exercise, inspired in some principles of tai chi chuan and PNF (Proprioceptive neuromuscular facilitation), following the normal pattern of human movement combined with breathing. Pnf-Chi® was created by physiotherapists experts in wellness and health promotion, having therefore a strong clinical input, and based on the available scientific evidence from areas such as kinesiology or exercise physiology. Strongly focusing on body awareness, balance and motor coordination, its characteristics make it very adaptable for the aging population. Since 2003, Pnf-Chi® classes have been gradually implemented in Portugal. After some successful pilot interventions with smaller groups of participants, Pnf-chi was the selected physical exercise form to be implemented in a major community research-action project developed in the field of health promotion directed toward the Azorian senior population. Counting with more than 1000 community-dwelling participants it was the biggest project of its kind ever to take place in the Azores (Portugal). The overall impact of the first edition was very positive which re-enforced the Azorean regional government commitment to support the second edition (starting on February 2012). Contents of the workshop: Part I: -General presentation of Pnf-Chi®; -Concept; - Principles; -Benefits; - Fields of intervention; - Research studies and community intervention projects. Part II - Practical Pnf-Chi® Session. Keywords: Physical Exercise; Health Promotion; Balance; Tai Chi; Neuromuscular.

INTRODUCTORY OSTEOFIT PROGRAM PROVIDES EFFECTIVE EXERCISE PROGRAM FOR SENIORS IN ADULT DAY PROGRAM SITES

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1Fraser Health Authority, Canada; 2BC Women’s Hospital & Health Centre, Canada.

Background: Adult Day Programs (ADP) present the perfect setting for providing exercise programs to improve the clients’ functional ability. Yet, most ADP staff are not trained to deliver a safe and effective exercise program for frail seniors. As a consequence, exercise programs at ADP sites are seated and done without any progression or not designed to
safely manage frail seniors. Therefore, this project aimed to fill a gap by training ADP staff to deliver a specialized exercise program for frail seniors. Due to its falls prevention focus, education components, and safety, OSTEOFIT, a program of BC Women’s Hospital & Health Centre was selected as a model to be adapted as a low level program for frail seniors. **Goal:**

To educate staff to deliver a standardized, safe and effective physical activity program to clients attending Day Programs for Older Adults. **Implementation:** In order to be certified, staff had to complete an online theory fitness course and attend three days of in-classroom instructions. Subsequent to that, staff conducted a 10-week exercise program including pre and posttests (Timed Up and Go, 5X sit to stand, and 4-meter walk). **Results:** There were 12 staff trained from 11 ADP sites. Pre and post measurements were acquired from 129 participants. Results showed that 57% of participants improved and 26% remained the same on the TUG test, 52% improved and 24% remained the same on the 5X Sit to Stand test, and 70% improved and 14% remained the same on the 4 meters walk. All staff reported the program was useful to their job and recommended this program to other ADP sites. **Keywords:** Osteoporosis; Training of Professionals; Physical Activity; Measurement of Activity.

**IMPLEMENTATION OF AN OTAGO EXERCISE PATHWAY FOR FALLS PREVENTION IN COMMUNITY/PRIMARY CARE**

Hawley, Helen

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Encouraging older adults to become more active and maintain that activity is critical to the promotion of their health and well-being. There is increasing evidence that exercise programmes including specific strength and balance exercises can significantly reduce the occurrence of falls (Sherrington et al., 2011). However, encouraging older adults who have experienced a major health issue to maintain exercise after rehabilitation is difficult. This workshop discusses the implementation and evaluation of a pathway from NHS delivered falls and fracture rehabilitation through to maintenance in community based exercise classes. It will also discuss a new initiative which places the pathway within GP practice. This evaluation aims to recruit all participants (N = 70) who will have attended NHS Rehabilitation and then Community Otago exercise programme over a 6 month period of time. Three programs in the community will run simultaneously for 3 months, followed by the second cohort of participants. Data collection: 1. Functional maintenance/improvement collected through validated assessment tools (Confbal, Timed Get up and Go) at baseline and 3 months (at the end of the intervention). 2. Long term adherence collated by asking older adults to keep home exercise diaries after the Otago program has been completed and by monitoring transition to the community Active Always program. Instructors delivering the Active Always program are those who deliver the Otago programme. 3. NHS records will be used to assess whether the programme has contributed to preventing patients re-accessing rehabilitation services and the patient journey after the Otago programme will be monitored (including hospital admission due to falls). 4. Focus groups/one to one interviews offered to assess satisfaction and experiences. The process of implementing the pathway and preliminary results and impact of results for commissioning and practice will be presented and discussed.

**BALANCING YOUR BODY AND COGNITIVE FUNCTION**

Furtado, Sofia; Silva, Celso

*Archeopraxis, Portugal.*

This workshop will cover exercises that stimulate the sensorimotor function and also a superior level of cortical integration. These exercises could contribute to fall prevention. The
use of unstable surfaces, as well as resistance training bands alongside oral information to
stimulates the “neuromotorcognition” control. The exercises will be done individually, in pairs
and as a group. The stimulation of postural control using anteroposterior and mediolateral
oscillations, with open eyes and closed eyes, will be take part of this workshop. Factors such
as coordination, body awareness, special orientation and velocity of reaction will be taken
in account as important psychomotor stimulation. The workshop session will be divided
into two parts: Oral introduction with the scientific fundamentals of the method, followed
by warm up, specific exercises, cool down. **Keywords:** Balance; Cognition; Sensory-Motor
Function; Fall Prevention.

**ADVANCING WHOLE-PERSON WELLNESS FOR OPTIMAL AGING: EXAMPLES OF SUCCESSFUL INITIATIVES IN SENIOR LIVING AND COMMUNITY SETTINGS**

Rose, Debra; Montague, Jan

*California State University, Fullerton, United States.*

To implement a whole-person wellness approach for optimal aging requires knowledge,
understanding, a radical shift in thinking, operational planning and evaluation. During this
workshop, we will define the whole-person wellness approach, describe the evolution of the
whole-person wellness model’s intentional emphasis on proactive living, present research
evidence that provides support for a whole-person wellness approach, and discuss behavior-
specific attitudes, language, and techniques that support and enhance whole-person wellness.
Participants will learn how to build a culture of wellness as it relates to the people, practices,
and environments of different organizations. Finally, examples of whole-person wellness
initiatives that have been successfully implemented in senior living and community settings
will be described. Particular emphasis will be placed on providing workshop participants
with strategies for marketing, developing appropriate program content, and tracking whole
person wellness outcomes (i.e., individual and organizational) in both types of settings.
**Keywords:** Wellbeing; Quality of Life; Optimal Ageing; Natural and Built Environment.

**CHARACTERISATION AND STANDARDISATION OF EXERCISE INTERVENTIONS IN AN OLDER ADULT EXERCISE TRIAL (PROACT65+)**

Gawler, Sheena1; Skelton, Dawn A2; Dinan-Young, Susie1; Morris, Richard1; Iliffe, Steve1.
1 *University College London, UK.*; 2 *Glasgow Caledonian University, UK.*

**Background:** The ProAct65+ trial is a multicentre cluster RCT comparing 2 exercise
interventions, the Otago Home Exercise Programme (OEP) and Falls Management Exercise
(FaME), with usual care, in patients aged 65 and over. The study has recruited over 1200
participants through GP practices in London and Nottingham, 400 of whom are in each of
the exercise arms. Both exercise interventions have a robust research background in falls
rate reduction, reducing falls by 35% (OEP) and 65% (FaME) respectively. Trained staff
are required for intervention delivery; Postural Stability Instructors (PSIs) for FaME and,
in ProAct65+, Peer Mentors (PMs) for OEP. The use of PMs to support OEP participants
is novel. **Aims:** To characterise the difference between the original interventions and those
used in ProAct65+, as well as describing fluctuations in the standardisation of interventions
in ProAct65+. This will be followed by a workshop allowing delegates to experience the
specific ProAct65+ FaME progressions. **Methods:** A descriptive comparison of the intervention
design and content was carried out between the original OEP and FaME trials and those
used in ProAct65+. Additionally, an analysis of ProAct65+ OEP and FaME intervention
characteristics was carried out, including season, PSI/PM demographics such as gender and age, PSI/PM ‘quality’, exercise dose, dose of PM support (telephone calls and home visits) and exercise progression. 

**Results:** The differences in intervention length, progression, patient contact time and adherence support strategies between ProAct65+ OEP and FaME and original OEP and FaME are substantial. The specific ProAct65+ progressions will be experienced practically in the workshop. 

**Discussion:** Exercise interventions designed to reduce falls have been adapted to be used as interventions to increase activity in older people who are not necessarily fallers. Independently of this, exercise interventions are not easily amenable to standardisation. The potential implications of exercise standardisation challenges in both research and falls exercise services will be discussed as well as effective use of evidence-based progressions.

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**Posters**

**BASIC STEPS: A TRAINING AND RESOURCE FOR STAFF WORKING IN RESIDENTIAL CARE**

Castell, Patricia S  
Northern Sydney Health District, Health Promotion, Sydney, Australia

‘Basic Steps’© is a falls prevention and physical activity training program for staff who provide activity programs for less active and frailer older people living in residential care facilities. It was developed by the Northern Sydney Health Promotion unit. The training program provides the underlying knowledge and skills to assist staff apply the appropriate strength and balance ‘exercise prescription’ within their classes and to assist with any new classes being developed. 

**Method:** ‘Basic Steps’ was presented as a 3 hour, face to face training session for residential care staff such as Diversional Therapists, Activity and Recreation Officers. 21 residential care settings received the training with 255 staff attending. It comprises of a theoretical base with accompanying practical exercise application to maintain the functional abilities required to reduce the risk of falls and related injuries. The training includes some falls prevention concepts from the ‘Fall Proof’© training program and uses the NSCCH ‘Staying Active - Staying Safe’© exercise resource format as the base for the exercises. 

**Results:** Evaluations were conducted at the initial training and after 3 months. 82.4% found that the training was excellent to good, with 78% reporting they could apply the information in their work situation. The training program was well accepted by the organisations involved. It was found to be informative and easy to implement and an increased uptake of appropriate exercise programs in the facilities was reported. Other facilities requested the training for their staff to upgrade their knowledge and skills. A CD/DVD resource and training manual has been developed as a result of these requests to enable this program to continue without the need for face-to-face training and to extend the program to more areas. 

**Keywords:** Residential Care; Health Promotion; Fall Risk; Training of Professionals.

**IMPROVED INPATIENT FALL RISK ASSESSMENT IN ELDERLY ACUTE PSYCHIATRIC WARDS IN INSTITUTE OF MENTAL HEALTH, SINGAPORE**

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**Introduction:** Falls are a common problem among older adults with higher prevalence in healthcare settings due to factors such as health conditions, medications and ward environ-
ment. In our Elderly Psychiatric wards patient’s fall risk was being assessed using screening tools, administered by nurses on admission. This process lacked the required specificity to exclude patients not at risk of falls thus making the risk assessment less meaningful. **Methodology:** Accurate assessment of fall risk is crucial to offer person centred care. We observed that not incorporating functional mobility assessment was resulting in over inclusion of patients at fall risk. We enhanced the assessment process by including physiotherapy assessment of mobility and balance. **Results:** With the inclusion of Physiotherapy assessment, there is a reduction in the number of patients identified to be at fall risk by 40% compared to the previous nursing assessment alone. We believe that this is a fair representation of patients at fall risk given that the assessment is done by trained physiotherapists. 2.There was no difference in the average number of falls when compared to earlier screening. 3. With the improved detection of fall risk, nurses on average save 30-45 min of their total shift time due to reduction in unwanted observations and documentation practiced earlier. **Conclusion:** 1. The enhanced screening approach appears to be more accurate and safe in identifying patients at fall risk. 2. With enhanced physiotherapist input, patients are receiving education on falls risk management and benefiting from exercise and increased use of walking aids. 3. From a care delivery perspective, we optimized the utilization of skill resources such as of physiotherapist and nurses to improve quality of care and therefore patient and staff satisfaction. **Keywords:** Fall Risk; Screening; Assessment, Training of Professionals.

**BALANCE AND MOBILITY IMPAIRMENTS IN INSTITUTIONALIZED ELDERLY: THE ROLE OF PHYSICAL EXERCISE FOR PREVENTING FALLS—AN ACT ON Ageing Study**

**Mulasso, Anna; Roppolo, Mattia; Magistro, Daniele; Liubicich, Monica Emma; Ciairano, Silvia; Girelli, Laura**

**University of Torino, Italy**

**Background:** falls are considered one of the most common and serious problem for the elderly (American Geriatrics Society, 2001) resulting in a strong economic impact for community and society (WHO, 2007). A moderate physical exercise may reduce gait and balance impairments in older people lowering the risk of falls and falls-related injuries (Gregg et al., 2000). **Aims:** (1) To assess the effects of a physical exercise on mobility and balance; (2) To investigate the possible mediation role of balance in the relation between participation in a physical training and mobility. **Methods:** the study involved 77 subjects (16 men and 61 women, mean age of 83±7 years) living in six residential care facilities in Piemonte. At baseline, the experimental (EG) and the control group (CG) were homogeneous for the variables under study. The EG participated to a biweekly aerobic training lasting 4 months. We collected baseline and post-test measurements for Tinetti Assessment Tool (Tinetti, 1986) and Timed Up and Go Test (TUG – Podsiadlo and Richardson, 1991). Data were analyzed with Mann Whitney U test, Effect Size (ES), linear regression and Sobel’s formula. **Results:** (1) Physical exercise produced a statistically significant increase in balance (p = .004; ES = .24) and mobility (p = .01; ES = .29) in the EG. (2) The analysis showed a significant main effect between participation in a physical exercise and mobility (p = .004; $R^2 = .43$). Balance played a significant role as a mediator (p = .00; $R^2 = -.58$), whereas the predictor lost of significance (p = .06; $R^2 = .24$). The R2 changed from .18 to .49 after the introduction of the mediation variable. The model was fully mediated (p = .01; Sobel z = 2.57). **Conclusion:** our findings suggested, firstly, the positive effects of physical training on motor abilities such as balance and gait in frail elderly with consequent reduction of falls risk (Lin et al.,
FEAR OF FALLING IN ACTIVE AND SEDENTARY ELDERLY
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According to demographic projections, 33 million Brazilians will be older than 60 years in 2025. It has been suggested that elderly people present reduced ability to control their posture, which may predispose them to increased risk of falling. Fear of falling and avoidance of activity due to fear of falling are common in older people, both in fallers and non-fallers. Habitual exercise counteracts the restrictive effects of the fear of falling on activities. 

Objectives: investigate the fear of falling in active and sedentary elderly.

Methods: were evaluated 64 community-dwelling elderly of city of Marilia, São Paulo, Brazil, divided in two groups: the first group included elderly who performed regular physical activity (AG), and the second group, those who did not perform physical activity (SG). The fear of falling was assessed by Falls Efficacy Scale International (FES-I). The association among the parameters was done by Fisher’s exact test and the comparison between groups was done by Mann-Whitney test. Significance was set at 5% level.

Results: The averages ages of the participants were 71.6 ± 5.1 years and 71.1 ± 4.6 years for sedentary and active groups, respectively (p = 0.69). FES-I values were found to be 29.47 ± 10.4 for the active group and 27.36 ± 10.6 for sedentary group (p = 0.31). When compared the values of FES-I among the groups considering the cut-points to differentiate between low and high concern (16–22 and 23–64, respectively), was not found significant difference (p = 0.07).

Conclusion: the practice of exercises didn’t interfere in the fear of falling in elderly, probably because the fear for falling is associated with psychological and behavior factors and not only with physical factors.

Keywords: Fear of Falling; Sedentary; Active; Elderly; Psychological Factors.

ASSESSMENT OF FUNCTIONALLY ORIENTED EXERCISE REGIMENS AIMING TO REDUCE OVERALL RISK OF INCIDENTAL FALLS
Zak, Marek1; Czesak, Joanna1; Szczerbinska, Katarzyna2; Kozlowska, Dorota1
1University School of Physical Education, Poland; 2Jagiellonian University School of Medicine, Poland

Background: Swelling proportion of the elderly in society requires adequate medical care and complex assistance in multiple functional deficits of daily living, consequently overstraining public health service resources, which prompts a quest for easy-to-apply and cost-effective systemic solutions.

Aim: To determine whether specifically structured, intensive exercise regimens, might improve and help sustain individual muscle strength and mobility, with a view to reducing risk for incidental falls and ultimately preventing an uncontrolled slide into care-dependency.

Methods: The randomised, 6-month clinical trial embraced 112 elderly nursing home residents with a history of recurrent falls (F 82, M 30; mean age 81 years), randomly split into three equal-sized groups: Group I - progressive resistance exercises (PRE) + functionally-oriented exercises (FOE), Group II standard exercises (SE) + FOE, Group III - SE + PRE. The subjects’ muscle strength was assessed with a dynamometer, whereas their individual functional capabilities with the 6MW and Tinetti’s POMA tests, respectively.

Results: Despite short duration of the study significant differences in muscle strength were noted both in favour of Group I and Group III (p = 0.02; p = 0.05; respectively), although not
translating directly into perceptible improvement in individual functional capabilities. Notable improvements in individual mobility were reported in Group II and Group III (p = 0.005), although with no impact on individual muscle strength. **Conclusion:** Only a multi-factorial intervention, i.e. functionally oriented exercise regimens, may appreciably improve overall functional status in the elderly in terms of reducing overall risk for sustaining incidental falls. **Keywords:** Muscle Strength; Mobility; Functionally Oriented Exercise; Fall Risk.

**THE ASSESSMENT OF FUNCTIONAL CAPABILITIES AND INDIVIDUAL PROPENSITY FOR FALLS IN ELDERLY WOMEN UNDERGOING BREAST CANCER TREATMENT**

Zak, Marek; Biskup, Malgorzata; Macek, Pawel; Opuchlik, Anna; Siwon, Anna; Krol, Halina

1University School of Physical Education, Poland; 2Holycross Cancer Centre, Poland; 3Holycross Cancer Centre, Poland

**Background:** The swelling proportion of women in an aging population, accompanied by an increased incidence of breast cancer and its successful treatment, prompts the need for assessing individual post-treatment functional capabilities and overall risk of sustaining incidental falls in this subgroup. **Aim:** The assessment of functional capabilities and individual propensity for incidental falls in the women over 65 years of age undergoing breast cancer treatment. **Methods:** The study embraced 107 women aged 65 - 84 (mean age 71 years) undergoing breast cancer treatment in the Holycross Cancer Centre, Kielce, Poland. Individual functional capabilities were assessed with the aid of the “Eight foot up & go test” and Tinetti POMA test, whereas a potential risk of fall was probed with a questionnaire addressing in detail the number of recently sustained falls and all attendant circumstances. **Results:** The scores achieved by the subjects in the “Eight foot up & go test” exceeded by 3.90 sec. - 1.90 sec. the reference values of the Senior Fitness Test for all respective age categories. The Tinetti POMA test results revealed that ca. 10% of the subjects scored below 19 points. Depending on the respective age categories, within one year of concluding the cancer treatment ca. 20% - 30% of women sustained incidental falls. **Conclusions:** The functional capability scores achieved by the elderly women undergoing breast cancer treatment failed to match the respective reference values for their age categories. They also proved equally prone to sustaining incidental falls as their non-treated peers. **Keywords:** Breast Cancer; Fall Risk; Functional Capability.

**DANCE AS THERAPEUTIC INTERVENTION FOR FALL PREVENTION AMONG COMMUNITY DWELLING OLDER ADULTS**

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1Seoul National University, South Korea; 2Southeast Missouri State University, United States

**Purpose of the study:** The main purpose of the current study is to examine effects of dance as therapeutic intervention on the risk of falls among community dwelling elderly living in Minneapolis, Minnesota. **Methods:** Participants A total of nine subjects were recruited by the primary researcher and dance instructors at Karios Dance Theatre for the present study from the adult care center of the Walker Senior Care Services located in Minneapolis city in Minnesota. Instrument SAFFE (Survey of Activities and Fear of Falling in the Elderly) was employed to assess fear of falling and avoidance of physical activity for quantitative analysis. In addition, interview questions were developed for qualitative analysis of data and...
one on one guided interview was conducted by primary researcher. **Findings:** Analysis of MANOVA reveals that there was no significant difference across all areas of SAFFE. This may be due to the small samples and more importantly, possibly due to nature of dementia which most of the participants exhibit to some degree. However, the study analysis did find some positive effects of the program by conducting qualitative analysis of interview data collected in multiple repetitions of the program. A primary researcher reviewed the interview data isolating meaning units of text. One member of the research team then reviewed all data to ensure all individual meaning units were identified. To categorize responses into themes, the data were then analyzed by employing thematic content analysis (Smith, 1992). The data were categorized into the following three themes: functional improvement (physical and cognitive), decreased fear of falling, and increased socialization. **Keywords:** Dance; Intervention; Dementia; Functional Improvement; Falls.

**MULTIFACTORIAL INTERVENTION TO REDUCE FEAR OF FALLING AFTER A HIP OR PELVIC FRACTURE: MODULES, MANUAL AND WORKSHEETS**

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Hip fractures are one of the most serious consequences of a fall amongst older people. Fear of falling, self-efficacy and perceived control may be important factors in the recovery from hip fracture. While there is some evidence for cognitive-behavioural interventions in community-dwelling older people (e.g. “A matter of balance”; Tennstedt et al., 1998), there is little evidence about FoF interventions in patients after hip fracture. The presented ongoing intervention is one of the very first interventions that evaluate the combination of exercises and cognitive behavioural elements across settings. Within 8 additional face-to-face sessions during rehabilitation, one home visit, and 4 telephone calls after discharge the multifactorial intervention comprises the following modules: **Relaxation techniques**-Depending on his preference the patient is taught in one out of two relaxation techniques. Each patient is provided with a MP3 player and a headphone to listen to the instructions between the sessions himself. **Mobility goals**-The early sessions focus on identifying meaningful areas of life and related mobility goals. **Fall-related cognitions and emotions, critical situations**-This module focuses on the evaluation of attitudes regarding falls, strategies to prevent falling and fear of falling. **Individual physical exercise programme for home-based training** - Based on the mobility goals an individual strength and balance exercise programme is being built up during intervention. **Implementing physical exercise programme and activities in daily life**- Individual motivation strategies are developed to encourage subjects to continue with exercising independently after discharge as well as to reuptake activities in daily life. **Fall hazards** - At the home visit the patients are supported to identify and encouraged to eliminate fall hazards. The modules, manual and worksheets of the ongoing randomized controlled trial will be presented. **Keywords:** Fractures; Falls Prevention; Fear of Falling; Mobility.

**MOTOR LEARNING TRAINING IMPROVES DUAL TASK PERFORMANCE IN PEOPLE WHO HAVE THE FEAR OF FALLING**

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**Background:** fear of falling make us to concentrate focus of attention in body movements (an internal focus) and as a result walking is not automatic anymore. Several reports suggested
that only an external focus of attention (directed at the movement effect) facilitate automatically in motor control, which promotes movement efficiency and gives us the possibility to perform a second task during the walk. The dual-task test is specific tool that estimate walking performance under a concurrent cognitive activity. It is possible to assume that it can be used as training instead of a more complex intervention. We took into consideration the verifying effectiveness of dual task and our motor learning training method to improve gait and balance in people who have the experience of falling and the fear of falling. **Methods:** in order to carry out our research we have created two different groups: control group (CG) and experimental group (EG) with the same standard of age, gender, number of previous falls. 32 subjects aged 67-85 years were recruited in each group. The (CG) to have one hour of ordinary gymnastics twice a week for 3 months, using a dual task. The (EG) also had been submitted to the same hour of special experimental gymnastics twice a week. **Results:** all participants showed an improvement in all tests. We present the average values obtained after our work: (EG): Tinetti test - 1.53, TUG - 11.2%, the speed of the normal path - 8.6%, the walking speed during the execution of the cognitive task (dual task1) - 16.9%, the walking speed during execution of the motor task (task2 dual) - 14.5%. (CG): Tinetti test - 1.1, TUG - 7.4%, the speed of the normal path - 5.7%, the walking speed during the execution of the cognitive task (dual task1) - 9.7%, the walking speed during execution of the motor task (task2 dual) - 9.5%. **Conclusion:** our method is demonstrated to be more effective than dual task in improving walking performance under a concurrent cognitive activity. **Keywords:** Dual Task; Walking; Cognition; Fear of Falling; Intervention.

**FALLS PREVENTION STRATEGIES IN PLACE IN CANADIAN LONG TERM CARE FACILITIES**

Johnson, Shanthi

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Falls are a major threat to the health of older adults. Compared to older adults who live in the community, residents of long-term care (LTC) facilities fall 2 to 4 times more often, and are twice as likely to injure themselves. While many LTC facilities are located in rural areas, falls and injury prevention literature is predominantly urban-centric. As such, this study examined the rural-urban differences in the falls prevention strategies involving 79 LTC facilities (of a possible 118 facilities) in Saskatchewan and using key informant telephone interviews of the Director of Care or alternate. The interview guide encompassed facility information, profiles of interviewees, and fall- intervention strategies currently in place in the facilities. Approximately 65% of the participating facilities were located in rural areas, while the remaining facilities in urban locations (approximately 35%) and the size of the facilities ranged from four to 270 residents (ave = 54). The majority of interviewees were female (90%) and had a nursing background (67%). The facilities were generally similar except for statistically significant differences in the size of the facility (ave = 35 beds in rural vs. 90 in urban areas) and length of operation (ave = 29 years in rural vs. 36 urban). In total, 84% of all facilities surveyed stated that falling was a concern and there were no statistically significant regional differences. Several falls prevention strategies were adopted by the facilities with the use of assistive devices, environmental modification, medication review and clinical assessments being the most common. Exercise as a falls prevention intervention showed the greatest rural-urban differences. However, there were no statistically significant regional differences in the falls prevention strategies in place in LTC facilities. The study highlights the need to promote promising and effective falls prevention strategies in rural as well as urban contexts. **Keywords:** Falls Prevention; Care Facilities; Rural; Urban; Canada.
COMPREHENSIVE CARE ENHANCES SELF-CARE ABILITY AND DECREASES EMERGENCY ROOM VISITS FOR OLDER TAIWANESE PATIENTS

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1Chang Gung University, Taiwan; 2University of Michigan, United States; 3MeiHo University, Taiwan; 4Chang Gung Memorial Hospital, Taiwan

Background: Little evidence is available on the effects of intervention models containing both hip fracture-specific care and management of malnutrition, depression, and falls. Whether a comprehensive approach is more beneficial to older patients with hip fracture is still unknown. Objectives: To explore the 2-year effects of an interdisciplinary, comprehensive care program for elderly patients with hip fracture. Methods: A Randomized experimental design was used. A 3000-bed medical center in northern Taiwan. Patients with hip fracture (N = 299), randomized to three groups: comprehensive care (n = 99), interdisciplinary care (n = 101), usual care (control) (n = 99). Usual care included only 1 to 2 in-hospital rehabilitation sessions without in-home rehabilitation, discharge planning, geriatric assessment or consultation. Comprehensive care integrated interdisciplinary care, which included geriatric consultation, continuous rehabilitation, and discharge planning, with nutrition consultation, fall prevention, and depression management. Patients’ self-care ability was measured as performance of activities of daily living (ADLs) and instrumental ADLs (IADLs) using the Chinese Barthel Index and Chinese version of Lawton and Brody’s (1969) IADL scale, respectively. Outcomes were assessed at 1, 3, 6, 12, 18, and 24 months following hip fracture. Results: During the first 2 years following hip fracture, patients in the comprehensive care group had better performance trajectories for ADLs and IADLs, and fewer emergency room visits than patients in the usual care group. Comprehensive care did not significantly affect patients’ mortality rates and hospital readmissions. Conclusion: Comprehensive care may improve self-care ability and decrease emergency room visits for elders up to 2 years after hip-fracture surgery. Our results may provide a reference for health care providers in countries using similar programs with Chinese/Taiwanese immigrant populations. Keywords: Fractures; Health Care Professionals; Comprehensive Care.

ANTICIPATORY AND COMPENSATORY POSTURAL ADJUSTMENTS IN THE ACTIVE ELDERLY SUBMITTED TO DISTURBANCE OF THE LATERAL POSTURE

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With advancing age, the human body suffers functional changes, which lead the postural instability in elderly people. And an important factor in this, are linked to the inappropriate uses of postural adjustments strategies: anticipatory postural adjustment (APA) and compensatory postural adjustments (CPA). Therefore, the aim of this study was to investigate the APAs and PCAs and their inter-relationships in groups of elderly (20 and 20 with and without falls) and 20 young subjects. The electromyography activity (EMG) of lateral ventral and dorsal postural muscles by recording, in four time windows (APA1, APA2, APC1 and APC2) typical for these reactions, and displacement of body center of pressure (COP). The postural disturbance occurred in the medial-lateral direction, through the impact of a pendulum on the right shoulder of individuals under two conditions: unpredictable and predictable. The results showed significant differences between time windows APAs and CPAs. During the
unpredictable condition, the activity of APAs did not occur, with the extensive activity of APCs. In the predictable condition, occurred APA activity with less activity APCs to the trunk and leg muscles. The elderly groups with and without falls had, in general, smaller amplitude activation (JEMG) of the PCAs to the studied muscles in both conditions. The elderly showed changes in the pattern of synergistic lateral muscles compared to the group of young individuals. There were wide movement of the COPy and COPx in the elderly with falls and young groups respectively. In general, the elderly showed changes only in the compensatory adjustments, mainly to the muscle (gluteus medius) which may make the elderly susceptible to falls. Based on the results, research and training programs/training or treatment designed to restoring balance in the elderly enhancing the activation of the gluteal muscle should be developed. **Keywords:** Postural Instability; Compensatory Adjustments; Anticipatory Adjustments; Disturbances.

**INSTITUTIONALIZED ELDERLY: FALLS AND FEARS**

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**Introduction:** Institutionalized elderly falls 30 to 50% per year (Tinetti, 1987). Fear of falling (FoF) -ptophobia- seems to be associated with previous falls history, however this is multifactorial (Legers, 2002; Zilstra, et al., 2007). Physical activity (PA) was be basal in FoF and falls decrease, yet FoF can be seen as a barrier to PA and consequently induce more independence. **Objectives:** This study has the following objectives: to quantify FoF; relate FoF with other variables (sex; number of falls; participation in PA programs and institution) and identify if FoF is a barrier to PA practice. **Methodology:** The sample is composed by 13 institutionalized elderly (32 men and 81 women) with aged between 65 and 97 years-old. Is a quantitative study and questionnaire was used to collect the sample. The FoF evaluation was performed by fitting Falls Efficacy Scale ¨C Portuguese version by Melo (2003). Data were analyzed by SPSS, version 13.0 and was used descriptive statistics and study of the mean difference. **Results:** Elderly people have on mean between ‘same’ and ‘little’ FoF in 10 daily situations (6.82 ± 2.94). FoF was only considered by one person as a barrier to PA practice. The variable ‘Evaluation scale of FoF’ has statistically significant differences (p > 0.01) for the variables, ‘Sex’, ‘Fall’ and ‘Institution’. **Discussion/Conclusion:** Such as Tinetti (1994) our results showed that although elderly has FoF in daily activities, this doesn’t extend to PA practice. FoF is superior in female, proven by others studies and corrobated by this. Elderly with previous falls seem to have more probability to have FoF. This relationship was identified by many studies too. FoF seems to be influenced also by institution but not influenced by participation in PA, that wasn’t expected, because PA practice is associated with more balance and less FoF. **Keywords:** Fear of falling; Falls; Elderly; Institutionalization; Physical Activity.

**TELEHEALTHCARE IN CARE HOMES TO REDUCE FALLS**

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It is estimated that 20% of unscheduled admissions to hospital with hip fracture are from care homes. Our aim was to utilise appropriate telehealthcare equipment to reduce the number of falls. Telecare products are not new but the range of telecare equipment available has been extended and is smarter. Telecare products monitor people at risk, improving their safety...
and helping them to stay independent for longer. A fractured hip costs the National Health Service between £15,000 and £25,000, a bed monitor costs around £300. This feasibility study evolved as it was felt that traditional methods of falls reduction were not effective i.e. visiting care homes and doing education sessions. This was not effective due to the transient nature of care home staff and difficulties of engaging them in a short session. Telehealthcare would be effective as the care home staff would recognise the equipment as easing their workload. Care Home residents are changing and they have increased care requirements, dementia problems are more prevalent and they have more co morbidities. The results show on average a 37% reduction in falls. This represents a significant cost reduction to the NHS. Quality of care provided is improved as staff can intervene more quickly. Residents and staff also report increased confidence with mobility for those residents with falls detectors as they feel safer and reassured knowing they will be found quickly if they have a fall. This supports Releasing Time to Care as routine checks are no longer required. This has proved particularly valuable overnight as residents are no longer disturbed by two hourly checks and staffs are freed up for other tasks. Residents also value the increased privacy as there is less routine monitoring required. Telecare can be an effective way to assist in the overall management of falls for care home residents. Its use should be considered as part of residents overall care needs and as part of a multi-factorial falls risk assessment. Keywords: Fall Risk; Hospital Admission; Technology; Fractures; Care Home.

THE INFLUENCE OF PERSISTENT PAIN ON FALLS IN OLDER PEOPLE

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It is known that older people with persistent pain are more likely to fall if they have pain in two or more joints. The reasons for this appear complex so this study explored what older people themselves thought about the link between pain and falls and their experiences of them. People over the age of 65 years living in the wider community who have had persistent pain for at least 3 months and who have fallen at least once in that time, have been invited to take part. A phenomenological approach to gain insight into older people’s experiences has been adopted. Keywords: Pain; Joints; Falls; Older People.

EFFECT OF STRONTIUM RANELATE ON VERTEBRAL PAIN SYNDROME AND FUNCTIONAL ABILITIES IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS

Povoroznyuk, Vladyslav; Dzerovych, Nataliia; Bondarenco, L; Verych, V; Gnylorybov, A; Hrytsenko, H; Hrytsenko, H; Kosterin, S; Kuhtei, O; Recalov, D; Synenkii, O; Trubina, S; Chizwikova, I; Shpilevaya, N; Jashina, E

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Aim: To evaluate the effect of strontium ranelate in treatment of systemic osteoporosis in postmenopausal women. Materials and methods: There were examined 894 postmenopausal women with systemic osteoporosis (average age 59.97±10.57 years, average height 161.82±7.09 cm, average weight 71.32±13.44 kg). Evaluation of pain syndrome and level of physical activity was carried out with visual analogue scale (VAS). Examination was performed before onset of treatment and after a four, eight and twelve month treatment course. Strontium ranelate (Bivalos, «Servier») was taken in a dose of one 2 g sachet as a
suspension in water once a day and 1 tablet of Calcemin-advance (Calcium – 500 mg, Vit. D – 400 IU) 2 times a day during 12 months. Results: The patients had the risk factors of osteoporosis: 28% of patients had osteoporotic fractures in their anamnesis; 17% – hip fractures in mother or father of patients, 12% – smoking, 8% – alcohol abuse, 27% of patients have taken corticosteroid tablets for more than 3 month. We observed a reliable decrease of vertebral pain syndrome (after treatment – 2.97±0.77, after four months – 2.24±0.85, after eight months – 1.61±0.94; after twelve months – 1.24±1.04; p < 0.00001) and increase of functional abilities of patients (after treatment – 1.50±0.67, after four months – 2.08±0.52, after eight months – 2.67±0.53; after twelve months – 2.88±0.63; p < 0.00001). Conclusion: It has been demonstrated that strontium ranelate treatment significantly decreases pronounced vertebral pain syndrome and improves functional abilities of patients in the postmenopausal women. Keywords: Osteoporosis; Postmenopausal Women; Physical Activity; Strontium Ranelate.

SENSE OF COHERENCE AFFECTS COMPLIANCE AND RESPONSE TO RESISTANCE TRAINING IN OLDER PEOPLE WITH HIP FRACTURE HISTORY

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Objectives: To study effects of sense of coherence (SOC) on training compliance and inter-individual changes in muscle strength, mobility and balance after resistance training in older people with hip fracture. Strong SOC enables a person to identify and use their resources to overcome stressors and improve wellbeing. Methods: Secondary analyses of 12-week randomized controlled trial of progressive resistance training in over 60-years-old community-dwelling people 0.5-7 years after hip fracture (n = 45;ISRCTN34271567). (2) Pre- and post-trial assessments included SOC (1), isometric knee extension strength, maximal walking speed, timed get-up-and-go(TUG) and Berg balance scale. Results: Baseline characteristics of the training and control group were similar (Table1). In the training group, those with weaker pre-trial SOC had no improved or slightly reduced performance at post-trial in TUG (r = –0.74) and Berg balance (r = 0.38; Figure1). In the control group, no association between SOC and change in performance was found. In repeated measures ANOVA, significant group x SOC interaction effects were found for TUG (p = 0.006) and Berg balance(p = 0.042), but not for muscle strength or walking speed. Weaker SOC was associated with poorer training compliance (mixed model; p = 0.009). Conclusions: Older people with hip fracture history and weaker SOC may not benefit as much from resistance training as those with stronger SOC. Those with weaker SOC had poorer training compliance, although training improved muscle strength regardless of SOC. More complicated mobility and balance tasks did not improve in those with weaker SOC. It may be possible to design training programs in a way that those with poorer SOC may benefit more, even without a necessary change in SOC. To optimize participation in rehabilitation or physical exercise programs and its effect in older people more research is needed. References: 1) Feldt et al. Qual Life Res 2006; 16: 483. 2) Portegijs et al. Arch Phys Med Rehabil 2008;89:1667. Keywords: Muscle Strength; Training Compliance; Fractures; Balance; Mobility.
EXTENDED HOME SECURITY SYSTEM CAPABLE OF DETECTING IRREGULAR MOVEMENTS/FALL FOR ELDERLY PERSONS

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This paper describes functional extension of the existing home security system gSHA-5000 in order to create much more ease, safe, comfortable, reliable, secure home environments especially for elderly with active. The current SHA-5000 can detects fire, gas leakage, intrusion, and doors/windows' open or shook by using each dedicated sensors, and a user alert sent from a wireless pendant-style module that is worn by habitants. Real-time status can be remotely sent via a telephone or IP line to either a security company or customer’s mobile phone. Email message indicating the status to mobile phone are also available. It can accommodate 8 wired and 32 wireless sensors in total. In order to create such home environments that are able to aware habitant’s condition especially for elderly with active, the system is being extended its function with wearable sensor(s) detecting body movements captured by both 3-axis acceleration and 3-axis angle speed. By compiling an individual’s data over long periods, the current movement can be ascertained relative to the baseline to find irregular state, especially a state lead to fall. The movement pattern is interpreted by a pattern recognition technology to predict the dangerous or irregular states. Major one is a fall beforehand that will reduce additional cost for injury/bedridden. In the functional extension, several type of hardware is under experiment; they are a pendant-style module, wristwatch type sensors, and sensors attached to a waist and/or a shoulder. Major specifications for wireless transmission of pendant-style module are; unidirectional transmission at 426.4375 MHz by MSK (Minimum Shift Keying) modulation with 1200 bps over 100 m distance. By using this system, habitants are able to enjoy his/her life with secure environments for not only home-related items, but proactive physical activities of themselves. Family/relatives living in a remote location can feel safe as well. Keywords: Home Security; Technology; Falls; Movement.

FATIGUE RECOGNITION: FOOT PRESSURE CAPTURE BY WEARABLE SENSOR

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Introduction: Fall-related injuries are a serious problem for the elderly in developed countries. When an elderly person falls, social costs will be high since they can yield bone fractures and even death. People at high risk of falls tend to show high gait variability, but most, especially the elderly, cannot easily discern physical fatigue, a key determiner of this variability. Methods: We target the distribution of the COP (Center of Pressure) of the foot as a fatigue metric. Experiments measure normal and fatigued gait. The foot pressure distributions of 10 subjects were measured as they walked normally for 30 m. Next, the subjects ran on a treadmill. Treadmill speed was gradually increased until each could run easily at a comfortable speed. The RPE (Rate of Perceived Exertion) of each subject was continuously monitored. Running was continued at rank 14 (Very, very light to somewhat hard) or under, and RPE was determined every min. If the RPE reached rank 15 (hard), running was halted. Immediately after the exercise, each subject walked 30 m. Analysis: COP was extracted from the right foot (270 steps) and subjected to gait analysis yielding time-sequential two-dimensional coordinate data. X-axis is the lateral direction of the right foot and y-axis is the
longitudinal direction. The subjects were classified as exhibiting either normal or fatigued walk. **Discussion:** COP analysis clearly demonstrated the changes that occur when fatigued. This demonstrates the possibility of estimating the fatigue currently experienced by the user. By using a wearable foot pressure sensor, gait data can be continuously gathered in everyday life, and the risk of a fall can be fed back to the user. The full paper will clarify the relationship between COP and fatigue level using more measurements for each subject. In addition, it will identify how to best use the data to prevent falls. **Keywords:** Fatigue; Fall-Related Injuries; Gait Variability; Foot Pressure Sensor.

**YOGA AND TAI CHI FOR FALL PREVENTION IN RESIDENTIAL CARE: A FEASIBILITY STUDY**

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**Background:** Higher vulnerability to injurious falls (1), disability and pain have a profound effect on the quality of life of older adults in residential care facilities (RCF). Tai Chi and Yoga are two forms of complementary alternative medicine that are emerging as having positive influence on balance, pain and quality of life (2,3). **Aim:** 1.To determine the feasibility of conducting a 14-week Tai Chi or Yoga program in a RCF. 2. To determine the feasibility of detecting changes in balance, pain experience and quality of life in older residents by comparing the intervention and control groups. **Methods:** The ethics approved feasibility study involved a randomised controlled trial with two intervention groups, where each group received 14 weeks of either Yoga or Tai Chi. The control group received usual care provided by the facility. Focus groups were conducted post intervention for all groups. **Results:** The comparison between the intervention and control groups on outcome measures from: Berg balance scale, verbal descriptor pain scale, Dementia quality of life questionnaire will be presented. **Conclusion:** The feasibility study would enable determining the appropriate forms of both Tai Chi and Yoga for RCF population and inform residential care providers and policy makers on practical issues in provision of similar programmes. **References:** 1.Sherrington, C., Lord, S. R., & Finch, C. F. (2004). Physical activity interventions to prevent falls among older people: update of the evidence. Journal of Science & Medicine in Sport, 7(1), 43-51. 2.Brown K, K. J., Lotz M. (2008). A yoga-based exercise program to reduce the risk of falls in seniors: a pilot and feasibility study. Journal of Alternative and Complementary Medicine, 14(5), 454-457. 3.Lee, L. Y. K., Lee, D. T. F., & Woo, J. (2009). Tai chi and health-related quality of life in nursing home residents. Journal of Nursing Scholarship, 41(1), 35-43. **Keywords:** Yoga; Tai Chi; Falls Prevention; Dementia; Balance.

**THE PROFILE OF POSTURAL CONTROL IN ELDERLY THROUGH TRADITIONAL METHODS**

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This study’s main objective was to characterize the profile of postural control in elderly through traditional methods. A sample of 75 people aged 68 years mean ± 6 years, according to the WHO considered old youth. 40 elements in the sample are regular practitioners of a structured physical activity programs and 35 elements are not engaged in structured physical activity. Data were collected on a platform of forces, through the CoP, in accordance with guidance from the volunteer. Signs of the platform and formula CoP anteroposterior (AP)
and mediolateral (ML), calculated and transformed the data into action, observable in stabi-
logram using formulas in MATLAB. The variables analyzed were the total displacement of
the oscillation (DOT), root mean square (RMS) amplitude of displacement (ACP), Average
Speed (VM), Total Average Speed (VMT), Area, Average Frequency (FM) and analysis of
frequency spectral peak frequency, frequency at 50% of the power spectrum and 80% of the
power spectrum. After data analysis it is concluded that significant differences exist between
Eyes open / Eyes closed, in measures of mediolateral oscillation between practice and not
structured in the practice of PA in total displacement of oscillation-DOT, the amplitude of the
displacement ACP ml, in Area in the ml plane, the VM EC (Eyes Closed), VMT EC (Eyes
Closed) at Frequency Average EC at Fpico EC and F80 EC. The practice of Tai Chi on uneven
surfaces and level of PA appear to influence the profile of postural control in the elderly.

Keywords: Postural Control; Force Platform; Eyes Open/Eyes Closed; Physical Activity.

SEASONAL VARIATION IN PHYSICAL ACTIVITY, SKIN PROTECTION BEHAV-
IOUR AND VITAMIN D: MAKE VITAMIN D WHILE THE SUN SHINES

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Background: Vitamin D levels in older adults at higher latitudes vary seasonally. Age-related
changes to cutaneous production of vitamin D, as well as insufficient ambient UVB for 3
months of the year in Tasmania (latitude 41 degrees south) have detrimental impacts on
serum levels of vitamin D in winter. Skin protection behaviours, especially avoidance of
sun in summer, have the ability to negatively impact vitamin D production. Study Design:
Longitudinal study design, measuring over 15 months. Participants: Adults over 60 years
dwelling in their own home. Outcomes: Serum vitamin D, physical activity, time spent
outside, skin protection behaviour and ambient UVB were measured at 5 time points, at
the end of each season. Analysis: Annual cyclic trends were investigated by fitting a sine
wave formula to data for each outcome measure. The amplitude of the seasonal variation
(in percentage change), the timing of the peak values and the annual mean values (mesor)
were estimated using repeated measures non-linear regression, adjusted for age and gender.

Results: Vitamin D (±15%; P < 0.001), time spent outside (±20%; P < 0.001) and physi-

cal activity (±13%; P < 0.001) vary seasonally, with highest levels in summer. The highest
values for activity and hours spent outside recorded in January (mid-summer) and occurred
4 weeks before the peak value in serum vitamin D. Skin protection is greatest at the end of
summer, when ambient UVB is highest. Although 76% of participants were insufficient in
Vitamin D during winter, 50% were still insufficient in summer. Conclusion: Many older
adults do not have sufficient levels of vitamin D in summer. Participants who were more
active outside had higher levels of serum vitamin D. Older adults at high latitudes should be
couraged maximizing their outdoor activity in summer, with frequent shorter bursts of skin
exposure to maximize vitamin D production without increasing skin cancer risk, so as to build
up reserves for winter. Keywords: Seasonal Physical Activity; Vitamin D; Skin Protection.

THE FEASIBILITY AND BENEFITS OF A STRUCTURED GYM PROGRAM
FOR ASSISTED LIVING RESIDENTS AT A CONTINUING CARE RETIREMENT
COMMUNITY

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The purpose of this study was to determine the feasibility and actual and perceived benefits of a strength and conditioning program for assisted living (AL) residents, 80 years of age and older, who are at risk for falls. A mixed-methods research design was employed to determine improvements in upper and lower body strength (quantitative) and to identify perceived program benefits (qualitative). Twelve (12) residents participated in the yearlong ‘open gym’ program (2 sessions per week) with supervision from a Senior Fitness Specialist and university student interns. The study took place at the continuing care retirement community (CCRC) where the participants reside. Pre-post measures of upper and lower body strength and endurance yielded individual and mean group increases. Findings indicated that AL residents, when provided the opportunity and support, will regularly participate in a gym program; take pride in their accomplishments; ultimately identify as “an exerciser;” make gym time a priority in their lives; promote the program to other residents; and, initiate increasing workloads. The conclusion of this study is that even the ‘old-old’ who live managing multiple chronic conditions and are identified as a “fall risk” will adhere to and benefit from a strength and conditioning program if we build it with their needs in mind.

**Keywords:** Gym Programme; Feasibility; Care Home; Fall Risk.

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**THE LONG-TERM EFFECTS OF CONTINUED PILATES EXERCISE IN OLDER, COMMUNITY DWELLING MEN AND WOMEN**

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**Background:** Poor balance and reduced strength remain important physical fall risk factors for older adults. Long-term balance benefits have been reported in older adults after short-term resistance training and Tai Chi interventions. Pilates a popular but the long-term benefits of Pilates have not been reported. **Methods:** 40 people (68±7yrs) participated in Pilates classes for 5 weeks, with measurement of balance and strength pre (T1) and post intervention (T2). At 12 months participants were invited to attend again (T3). Postural sway, four square step test (FSST), Timed Up and Go (TUG) and strength were measured. T3 participants were split into those who had continued Pilates classes and those who ceased. Within group changes were compared using a one-way ANOVA. Comparison between T3 groups was performed via independent t tests. **Results:** 30 people attended at 12 months. Dynamic balance and function improved after the initial Pilates training (T1-T2), and was maintained at T3. No strength improvements were recorded at T2. There were significant differences at T3 for FSST (0.5 sec; P = 0.025) and TUG (0.5 sec; P = 0.022) between participants who continued performing Pilates (N = 14) and those who had ceased. Participants who continued Pilates were significantly stronger at T3 (6.6 kg; P = 0.006). Postural sway improved (T1-T3: 2.6 cm) but was not significantly different between groups at T3 (P = 0.300). **Discussion:** Balance and function benefits are apparent after a short Pilates intervention at one year after the program. Increased benefits, including strength, exist for those who continue Pilates for a year compared to those who ceased after 5 weeks. **Conclusion:** Pilates has been shown longer-term to provide benefits to strength and balance. **Keywords:** Pilates; Strength; Balance; Tai Chi; Postural Sway.

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**MORPHOFUNCTIONAL CHARACTERISTICS AND RISK OF OSTEOPENIA AND OSTEOPOROSIS IN ELDERLY MALES AND FEMALES**

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Bone mass, strength and quality in the elderly have been associated with morphofunctional characteristics and environmental factors, namely, physical activity (PA). **Objective:** The present study aimed (1) to determine the prevalence of osteopenia and osteoporosis in elderly males and females, and (2) to examine their association with lower-body strength (LBS), aerobic endurance (AE), PA, and legs lean tissue mass (LLTM). **Design:** This cross-sectional study included 802 subjects, 401 males and 401 females, aged 60-79 years, from Autonomous Region of Madeira, Portugal. LBS and AE was assessed by the chair stand and 6-min walk tests from the Senior Fitness Test. Bone mineral density (BMD) at the femoral neck (FN) and LLTM were determined by dual-energy x-ray absorptiometry-DXA. FN BMD (g/cm²) was used to define osteopenia and osteoporosis according to the criterion proposed by the World Health Organization. PA was assessed through the Baecke questionnaire. Statistical analysis included descriptive statistics, Pearson product-moment correlation coefficient and logistic regression analysis (LRA). **Results:** The prevalence of osteopenia was 39.4% and 49.5% in males and females, respectively. Osteoporosis reached 5.0% in males and 8.2% in females. The FN BMD (g/cm²) was positively related to LBS (p < 0.002 and p < 0.001) and, AE (p < 0.026 and p < 0.001) in males and females, respectively. A similar result was found with total PA, but only in females. The strongest predictor of osteoporosis or osteopenia was LLTM [odds ratios of 3.8 (95% CI: 0.23-0.63) and 4.1 (95% CI: 0.26-0.65) in males and females, respectively]. **Conclusion:** This study demonstrated that total PA, LBS and AE were positively associated with FN BMD (g/cm²). The strongest predictor of osteopenia and osteoporosis in Portuguese elderly was LLTM. **Keywords:** Osteoporosis; Osteopenia; Strength.

**CLINICAL ASSESSMENT OF REACTIVE BALANCE CONTROL: PRACTICE PATTERNS AMONG ONTARIO PHYSIOTHERAPISTS**

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**Introduction:** Reactive balance control, the ability to generate rapid postural responses when external instability threatens to move the center of mass outside the base of support, ultimately determines whether or not an individual will fall following a loss of balance. As reactive control is related to fall risk and amenable to treatment, it should be routinely incorporated in balance assessment. The purpose of this study was to determine how physiotherapists assess reactive control in clinical practice. **Methods:** A cross-sectional survey was conducted. A questionnaire was mailed to 1000 physiotherapists in Ontario, Canada who treated adults with balance impairments. The questionnaire asked respondents about the components of balance they assess and standardized measures used (reported in Sibley et al. 2011 Phys Ther), and specifically probed how they assess reactive control. **Results:** Three hundred sixty nine individuals completed the questionnaire. Of the 277 respondents who assessed reactive control at least some of the time in their practice, 14.0% used a standardized measure, 82.3% used a non-standardized approach, and 17.3% used both. Thirty-three methods of assessing reactive control were reported. The most common methods used were non-standardized perturbations (43.1% of 239 respondents who answered an open-ended question) and movement observation (19.7%). The remaining 31 methods were each used by less than 8% of respondents. **Conclusions:** Despite the availability of instrumented technology and valid standardized measures to evaluate reactive control, respondents relied primarily on non-standardized approaches and observational assessment. Furthermore, many of the standard measures respondents used to assess reactive control do not contain a specific test
evaluating reactive control. Future work should examine the factors influencing choice of reactive control assessment tools and promote awareness about standardized measures for reactive balance control. **Keywords:** Balance Control; Physiotherapists; Clinical Practice; Measurement of Balance.

**ASSOCIATION OF FALL WITH EXERCISE AND FARMING WORK AMONG CHINESE NONAGENARIANS AND CENTENARIANS**

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**Objectives:** Previous studies show that exercise can prevent the occurrence of fall. However, less is known about the relationship between falls and exercise and farming working in Nonagenarians/Centenarians. Due to lots of old people in China are still working in farmland. This study was conducted to observe the association of fall with habits of exercise and farming work among very old people. **Methods:** In the present cross-sectional study, we observed the association of fall with habits (current and former) of farming work and exercise among very old people using a Chinese cohort aged 90-108 years. **Results:** The population included 805 unrelated Chinese nonagenarians and centenarians (68.94% women, mean age 93.70 years). In women, subjects with current habit of farming work had significantly higher prevalence fall than those without this habit \( p = 0.032 \); but subjects with current habit of exercise had significantly lower prevalence fall than those without this habit \( p = 0.009 \). However, in men, there was no significant difference in prevalence of these habits between subjects with and without fall. After adjust for age, gender, body mass index, educational levels, Living styles, vision levels and temperament, we found that current habit of farming work and exercise had a significant odds ratio (OR = 1.527 95% CI (1.142, 2.042) and OR = 0.631 95% CI (0.429, 0.928), respectively) for fall. **Conclusions:** In summary, among nonagenarians and centenarians, among habits (current and former) of farming work and exercise, there seems to be significant association of fall only with current habits of farming work and exercise. The habit of farming work might be positively associated with fall, but the habit of exercise might be negatively associated with fall in Chinese longevity old people. **Keywords:** Rural, Urban; Falls; Exercise; Habits; China.

**IMPACT OF A THEORY-BASED OSTEOPOROSIS EDUCATION INTERVENTION ON PHYSICAL ACTIVITY IN OLDER ADULTS: A RANDOMIZED CONTROLLED TRIAL**

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**Objective:** Whether dual energy X-ray absorptiometry (DXA) screening alone or combined with a theory-based education intervention, results in an increase in habitual physical activity and the decision to start or increase weight-bearing activity to prevent or manage osteoporosis. **Materials and Methods:** Men and women 50 years of age and older (age range 50-80 years), were referred by their healthcare provider to undergo DXA screening for the first time at the local hospital. Participants \( n = 182 \) were randomly assigned to an intervention group \( n = 91 \) or control group \( n = 91 \). Both groups underwent DXA screening and completed Voorrip’s physical activity questionnaire to assess habitual activity. The intervention group also received theory-based osteoporosis education. Six months after baseline, participants completed Voorrip’s questionnaire again and a follow-up questionnaire evaluating change
in weight-bearing activity. Group differences and differences based on DXA results (osteoporosis, osteopenia, normal) were compared using chi-square, paired/independent t-tests, and contingency tables/ANOVA. **Results:** At follow-up, 25.8% of participants reported starting or increasing weight-bearing activity, but there was no significant difference between groups. Habitual physical activity decreased from baseline to follow-up in both groups. At follow-up, the intervention group had slightly increased activity scores (M = 11.93, SE = .68) compared to control group (M = 10.43, SE = .59); however this difference was not significant (t(171) = -1.72, p > .05). Osteoporosis diagnosis was associated with significant increase in weight-bearing activity (p = .05), but not habitual activity. **Conclusions:** This study provided evidence that a theory-based education intervention was unsuccessful in increasing weight-bearing or habitual physical activity. More research is needed in using a theory-based approach for improving physical activity to promote bone health in this population. **Keywords:** Osteoporosis; Bone Health; Physical Activity; Intervention; Questionnaires.

**RELIABILITY OF TEMPORAL AND SPATIAL GAIT PARAMETERS DURING TREADMILL WALKING IN COMMUNITY-DWELLING HEALTHY SENIORS**

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The present study focused on between- and within-day-variability of temporal and spatial gait characteristics during treadmill walking in healthy seniors. In 20 active seniors (10 women, 10 men, age: 64.8 (SD 3.2) years, height: 1.70 (0.10) m, weight: 69.7 (10.9) kg, physical activity: 11 (6) h/week-1), gait characteristics were assessed on three days in weekly intervals (between-day variability). Either on day 2 or 3 testing was repeated 30 min after the initial trial (within-day variability). Spatiotemporal gait parameters as well as gait variability were determined during 400 steps at a normal walking speed (5.0 (0.4) km/h-1) on a one-dimensional ground reaction force measuring treadmill. No significant mean differences were observed in any parameter for between- and within-day comparisons. Between-day ICC were high (ICC ≥ 0.86) for most parameters despite for temporal (ICC = 0.44) and spatial (ICC = 0.22) gait variability. Coefficients of variation (CoV) were also high in the latter parameters (CoV = 30.2 - 36.1%), whereas all other variables showed clearly lower values (CoV < 7%). CoV were still lower between days 2 and 3 (CoV < 5%). Compared to between-day comparisons within-day variability was comparable in spatiotemporal gait parameters (CoV < 5%, ICC ≥ 0.97) and lower in gait variability parameters (CoV < 18%, ICC ≥ 0.72 - 0.74). In conclusion, most gait parameters were highly reliable during treadmill walking. Changes of less than 10% can be detected with sufficient confidence. Gait variability parameters were less reliable and, thus, should be carefully interpreted. **Keywords:** Gait Parameters; Treadmill Walking; Physical Activity.

**THE EFFECTS OF 12 WEEKS PILATES-INSPIRED EXERCISE TRAINING ON FUNCTIONAL PERFORMANCE IN OLDER WOMEN**

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**Background:** Lower-extremity weakness and balance impairment are considered independent predictors for future falls. So, falls prevention exercise, including strength, balance and walking training, should be recommended to the general community as well as those
at high risk for falls. Pilates inspired-exercise claims to improve muscular strength, balance, flexibility and cardiorespiratory fitness in old age, however, its benefits are still under investigation. This study investigates the effects of 12-week Pilates-inspired exercise on functional performance in community-dwelling older women. **Methods:** Forty community-dwelling older women were randomly allocated to Pilates-inspired exercise training (PG, n = 21, 66.0 ±1.4yrs) or control group (CG; n = 19, 63.3 ±0.9yrs). The functional performance on one-leg stance (OLS), timed-up and go (TUG), 5-repetition sit-to-stand (STS) and six-min walk (6MW) tests were evaluated before and after Pilates training (2x/week, 60 min/session) or control period. Each exercise session was divided in warm-up (10 min), Pilates inspired-exercises (40 min) and cool-down period (10 min). The exercises were performed on mats, using accessories such as exercise rubber bands, Swiss and exercise balls. Group and time effects on functional performance were assessed by repeated measures ANOVA. Intragroup differences were evaluated by paired t-test. The level of significance was set at p ≤ 0.05. **Results:** After 12-weeks, time effects were observed for STS (p = 0.03) and 6MW tests (p < 0.01). Only PG decreased significantly the time spent to rise from a chair and return to seated position (2.0s faster, p = 0.02) and increased the distance walked in six min (~30m, p < 0.01). OLS and TUG performance remained unaltered in both groups. **Conclusion:** Pilates inspired-exercise improved lower-extremity strength and cardiovascular fitness in community-dwelling older women. Therefore, it may be a potential exercise regime to prevent falls in old age. **Keywords:** Balance Impairment; Pilates; Cardiovascular Fitness; Falls Prevention.

**THE INFLUENCE OF ABDOMINAL FAT ON BONE MINERAL DENSITY**

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Obesity and osteoporosis, two disorders that become more prevalent with advancing age, are becoming increasingly deleterious public health concerns in Europe and throughout the world. While excessive fat mass was previously thought to have a protective role on bone health, recent publications have documented a negative relationship between abdominal fat and bone mineral density (BMD) in adults (Katzmarzyk et al 2012). The aim of this study was to assess whether increased abdominal fat is associated with poor bone health. A cross-sectional analysis was conducted. Total BMD and abdominal fat (L1-L4 region) was measured using dual-energy x-ray absorptiometry (Lunar iDXA™, GE Healthcare, Chalfont St Giles, Bucks., UK) on 1,303 Irish adults (females n = 770, males n = 534) aged 18-81y. Using a linear regression model that adjusted for body mass, gender and age and accounted for 63.2% of the variance in BMD, abdominal fat was found to be negatively related (β = -0.234) to BMD. Being female and older (p < .0001) were also associated with a lower BMD. As indicated by variance inflation factor (VIF) analysis there was no influence of multi co-linearity in the regression analysis. These data provide supportive evidence for an influence of increasing abdominal fat mass on bone health that is particularly relevant to the ageing population. **Reference:** Katzmarzyk, P. T., Barreira, T. V., Harrington, D. M., Staiano, A. E., Heymsfield, S. B. and Gimble, J. M. (2012) ‘Relationship between abdominal fat and bone mineral density in white and African American adults’, Bone, 50(2), 576-579. **Keywords:** Obesity; Osteoporosis; Bone Health; Ageing.
PECULIARITIES OF RELATIONSHIP BETWEEN STRUCTURAL-FUNCTIONAL STATE OF BONE TISSUE AND KNEE OSTEOARTHRITIS IN POSTMENOPAUSAL WOMEN

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The aim was to study the age-related particularity of relationship between structural-functional state of bone tissue and development of knee osteoarthritis (KO) in women of postmenopausal period. **Material and Methods:** 175 postmenopausal women aged 50-79 years old with KO were examined, the control group consisted of 60 healthy women. Bone state was measured by Dual-energy X-ray absorptiometry “Prodigy” (DXA), calcaneus quantitative ultrasound (QUS) densitometry “Sahara,” digital X-ray radiogrammetry (DXR) of the II-IV metacarpal bones (OSTIM+). **Results:** We found the significant correlation between indices of QUS and presence and stage of KO. In patients with I stage of KOA densitometry data were significantly higher compared with healthy women, but in patient with III stage of KOA they were significantly lower (Stiffness index: 0 st. KO – 76.5±16.4; I – 83.6±15.9; II – 71.0±13.6; III – 67.8±14.1; F = 4.33, p = 0.005). Analysis of aging particularities showed that significant differences ultrasound densitometry data were in postmenopausal women aged 50-59 and 60-69 years old with knee osteoarthritis but were not in patients 70-79 years old. In postmenopausal women we did not found significant relationship between indices of DXA (lumbar spine, neck, total femur) and digital X-ray absorptiometry and presence/stage knee osteoarthritis, except bone mineral density (BMD) of total body and total spine. The indices of BMD of total spine were significantly higher in postmenopausal women with III stage of KO compared with healthy patients and women with early stages of osteoarthritis (0 st. KO - 0.90±0.12; I – 1.00±0.10; II -1.01±0.15; III – 1.08±0.12 g/cm²; F = 7.31, p = 0.0001). **Conclusion:** Presence and stage of knee osteoarthritis had significantly influence on QUS data, but not on DXA indices (lumbar spine, neck, total femur) and digital X-ray absorptiometry. **Keywords:** Knee Osteoarthritis; Bone Tissue; Postmenopause; Ultrasound.

QUANTITATIVE ULTRASOUND DENSITOMETRY AND FRAX® IN EVALUATION OF STRUCTURAL-FUNCTIONAL STATE OF BONE IN POSTMENOPAUSAL WOMEN

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The aim of the study was to estimate the informative value of quantitative ultrasound and its combination with FRAX® in evaluation of structural-functional state of bone in Ukrainian postmenopausal women. **Material and Method:** 363 postmenopausal women aged 45-87 years were examined, average age 65.1±0.5 years, duration of postmenopausal period 16.5±0.5 years. Bone mineral density (BMD) was measured by Dual-energy X-ray absorptiometry (DXA) “Prodigy” and calcaneus quantitative ultrasound (QUS) “Sahara.” The ten years probability of major osteoporotic fracture calculated with FRAX® tool. **Results:** There is difference in distribution of bone indexes in depending of used methods. Among women which had osteoporosis of femoral neck by DXA, 34% had osteoporosis, 57% − osteopenia, 9% − norma data by QUS. Sensitivity of QUS indexes ranging was from low to moderate, but specificity was low (with femoral neck – 38% and 39%, total hip – 63% and 34%, lumbar spine – 45% and 34%, total body – 56% and 34% accordingly). Such sensitivity and speci-
ficity increased when combining QUS with the ten years probability of major osteoporotic fracture without BMD (FRAX®) (with femoral neck – 71% and 87%, total hip – 90% and 100%, lumbar spine – 72% and 83%, total body – 79% and 91% accordingly). Conclusions: QUS of is informative method in evaluation of structural-functional state of bone in postmenopausal women. Sensitivity and specificity increased when combining QUS with FRAX® from 38% and 34% up to 90% and 100% accordingly. Keywords: Postmenopause; Ultrasound; Bone Health; Fractures; Ukraine.

IMPACT OF EDUCATION ON NURSING KNOWLEDGE TO IMPROVE INPATIENT CARE IN ELDERLY PSYCHIATRIC WARDS

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Introduction: At institute of Mental Health (IMH), Department of geriatric psychiatry, patient’s safety is one of our top priorities. Among several strategies to minimize falls, physical form of restraint has been historically in practice as a fall prevention strategy as a last resort. Research evidence shows no significant benefit of using restraints for fall prevention. Instead they may actually lead to unwanted consequences. Restraint use can also be stigmatizing to the overall image of psychiatric care. As use of restraints is primarily an aspect of nursing care, we conducted a survey among ward staff of their knowledge of restraint use and preference for restraint free policy. Methodology: Our survey included questions on safety and efficacy of restraints, the most preferred and the least preferred method of restraint and preference of a restraint free policy. A preliminary survey was followed by small group teaching sessions attended once by nursing staff who have participated in the survey. We conducted a post-teaching survey using the same questionnaire on those who attended the teaching and those who have not attended the teaching. Results: 1. The pre-education survey included 37 ward staff. 78% did not prefer restraint free policy and 45% believed that restraints were not at all harmful. 2. Those staff who did not attend the teaching sessions (17) maintained their views as before with 82% still not in favour of restraint free policy and 52% believing that restraints are not at all harmful. 3. The group who attended teaching session (16) showed a significant change in their views with now only 50% not favouring restraint free policy and only 18% believing that restraints are not at all harmful. Conclusion: 1. Ongoing education plays a crucial role in continuous professional development and improved patient care. 2. Education of ward staff should be objective and based on research evidence to improve acceptability by minimizing potential bias of views expressed. Keywords: Training of Professionals; Inpatient Care; Psychiatry; Mental Health.

TEST-RETEST RELIABILITY OF SIT-TO-STAND PERFORMANCE MEASURES WITH A PENDANT-WORN ACCELEROMETER

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Introduction: Measures of performance of mobility related activities in daily life, like sit-to-stand (STS), are important indicators of overall functioning and fall risk of old people. Recent advances of on-body sensors brought new insights in measuring STS performance in an unobtrusive way. In many studies, STS measures require fixation of sensors on truck or
thigh to ensure conformity of measurement results. However, fixed body location is to some extent inconvenient for long-term monitoring. Hence, the usability in daily life applications is limited. Therefore, we investigate the test-retest reliability of various STS performance measures with a pendant-worn 3D accelerometer. **Methods:** 10 young adults (age: 21.9±1.2) volunteered to complete two sessions of an experiment with 1 week time in between. In each session, they performed standing up with 3 trials in normal speed and 3 trials as fast as possible. The 3D accelerometer sampling at 50Hz was worn with a necklace belt pendant at the chest location. Maximum vertical acceleration, maximum jerk, scaled duration and scaled peak power of STS were analyzed. The intraclass correlation coefficient (ICC) of averaged measures, computed with two-waymixed model and 95% confidence interval in consistency, is used to assess the test-retest reliability. **Results:** Excellent reliability (ICC ≥ 0.75) was seen with measures of maximum vertical acceleration (fast: 0.88/normal:0.94), maximum jerk (fast:0.95/normal:0.94)and scaled peak power (fast:0.84/normal:0.79). Scaled duration was found with excellent reliability in measures of fast STSs (0.93) and good reliability in normal STSs (0.72). **Conclusions:** In this preliminary study, the pendant-worn accelerometer showed good to excellent relative test-retest reliability in averaged measures of STS parameters in young adults. The results indicate the feasibility of using pendant-worn 3D accelerometer in assessment of STS performance. A similar study is ongoing in older people. **Keywords:** Pendant-Worn Accelerometer; Mobility; Sit-To-Stand; Assessment; Reliability.

**PECULIARITY OF FUNCTIONAL TESTS IN PATIENTS WITH VERTEBRAL FRACTURES**

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The purpose of the study was to examine the functional activity in patients with vertebral fractures. We examined 153 postmenopausal women (60-89 years old), divided into two groups: the first – without osteoporotic fractures, the second – with vertebral fractures. **Methods of research - questionnaires (to assess life style), functional tests (dynamometry, static balancing, 15-meter test), Thomayer’s, Schober’s, Ott’s tests, orthopedic examination (range of movement assessment in the thoracic/lumbar spine, determination of the chest excursion and breath holding spell), dual-energy X-ray absorptiometry (DXA). Bone mineral density (BMD) of lumbar spine and femoral neck in patients with vertebral fractures was significantly lower than appropriate data in control group. Indexes of daily activity in patients with vertebral fractures were considerably lower compared to the control group. It was found significant differences in Schober’s test and parameters of movement of the thoracic and lumbar spine. Others functional tests were without significant difference. In patients without vertebra fractures it was found the significant positive correlation between BMD of the femoral neck and lumbar spine and data of functional tests indexes (dynamometry, Thomayer’s, Schober’s tests, maximum and average chest excursion). In contrast, in patients with fractures we didn’t found significant correlation between BMD data and indexes of functional tests. In patients with vertebral fractures was determined significant correlation between Schober’s tests and breath holding spell in contrast to patients without vertebral fractures. Vertebral fractures leads to reducing of functional ability. **Keywords:** Fractures; Functional Test; Postmenopause; Vertebrae.
BARRIERS AND ENABLERS TO PHYSICAL ACTIVITY AMONG OLDER AUSTRALIANS WHO THINK THEY ARE INSUFFICIENTLY ACTIVE

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Background: Older adults’ participation in physical activity is essential for prevention and treatment of cardiovascular, metabolic and bone diseases yet less than half of older adults are sufficiently active. Physical activity interventions targeting older adults can be optimised if barriers and enablers are better understood. This study examined whether associations between barriers and enablers of physical activity differ by demographic and health characteristics and which were associated with meeting physical activity recommendations.

Methods: Participants were 2,225 adults aged 65 years and above who perceived themselves to be insufficiently active and self-reported their barriers and enablers to physical activity in the 2009 New South Wales Falls Prevention Survey (Australia). Binary logistic regression analyses examined associations between barriers and enablers and meeting physical activity recommendations. Results: Forty five% of respondents met physical activity recommendations, participating in at least 150 min a week. After adjusting for gender, age, BMI, and education, people who listed ill health (51%) as a barrier (OR = 0.53, 95%CI 0.43-0.65) and people who listed having no one to exercise with (4%; OR = 0.48, 95%CI 0.27-0.85) were significantly less likely to meet recommendations. Those citing too expensive (3%) as a barrier (OR = 2.33, 95%CI 1.27-4.29) and those who listed nothing will help (33%; OR = 1.39, 95%CI 1.12-1.73) and making time to be active (8%; OR = 1.76, 95%CI 1.23-2.53) as enablers were significantly more likely to meet physical activity recommendations.

Conclusions: These findings give insights into older adults’ perceptions of factors that influence their physical activity, which could assist physical activity program planning in this population. In particular, the study highlights the importance of consideration issues related to health status and social support when developing physical activity programs for older people. Keywords: Physical Activity; Barriers and Enablers; Social Support.

PHYSICAL ACTIVITY, ADIPOSITY, AND MUSCLE QUALITY: IMPACTS ON PHYSICAL FUNCTION IN BMI AND AGE-MATCHED OLDER MEN AND WOMEN

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Older men typically have more physical activity (PA), more muscle mass, strength and power, less adiposity (%Fat), and better lower extremity physical function (LEPF), and relatedly, less risk for physical disability compared to older females. Much contemporary research is exploring the interactive relations among PA, leg strength and power, %Fat, and LEPF in older adults. Muscle quality (MQ), defined here as power per unit of lower body lean mass, may allow a novel exploration of this health disparity between the sexes as it accounts for differences in muscle mass. The aim of this study was to assess the influence of MQ and %Fat on LEPF in older men and women matched in age and BMI. Older adults (n = 80, 76.0±5.8 years, 27.1±3.8 kg/m²) were assessed for PA via questionnaire, body composition via DXA, leg power via Nottingham power rig, and LEPF using a Physical Performance Test (PPT, score range = 0 to 36), 30s chair rise (CHR), and 8 foot up and go (UpGo) tasks.
PA was not related to %Fat (r = -.17, p = .14) or MQ (r = .16, p = .17); %Fat was related to CHR and UpGo (r = -.29 and .22, respectively, p < .05) and MQ was related to all measures of LEPF (r range = .38-.49, p < .05). Men and women did not differ in PA, %Fat, PPT, or UpGo (all p > .05). Men performed 11% more CHR (p = .03) and had 25% greater MQ (p = .01) than women. When grouped via PPT performance [low (<30), moderate (31-33), or high (>33)], better function was associated with greater MQ in a similar and sequential manner (p < .05) in males and females (p = .05); however, PPT groups did not differ in %Fat (p > 0.05). Greater MQ did not translate into higher PPT in males. This relation between MQ and PPT, although similar in pattern but different in magnitude, may be partially explained by the higher relative load (body mass) to be carried during the PPT for males. More work is needed to explore the relations among MQ, body composition and LEPF to elucidate interventions to reduce risk for disability in both sexes. Keywords: Physical Activity, Muscle Quality; BMI; Adiposity.

IMPACT OF PHYSICAL ACTIVITY, MUSCLE QUALITY AND ADIPOSITY ON PHYSICAL FUNCTION IN OLDER WOMEN VARYING IN FUNCTIONAL STATUS

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Relations exist among physical activity (PA), leg strength and power, adiposity, and lower extremity physical function (LEPF) in older women. The primary predictor of LEPF appears to depend on physical functional status with muscle strength and power being a primary contributor in low functioning individuals and adiposity being more important in higher functioning women. Our own lab has also determined that muscle quality (MQ), defined as leg strength per unit of leg lean mass, plays a major role in LEPF. This study aimed to explore the utility of a novel expression of MQ (leg power per unit of lower body lean mass) to determine how MQ and adiposity (%Fat) differentially influence LEPF in older women across levels of functionality. Women (n = 101, 74.1±5.8 yrs, range 65–93 yrs) were assessed for PA via questionnaire, body composition via DXA, leg power via Nottingham power rig, and LEPF using a Physical Performance Test (PPT, score range = 0 to 36), 30 s chair rise (CHR), and 8 foot up and go (UpGo) tasks. As expected, age was associated with variables of interest, thus statistically controlled. PA was not related to MQ or %Fat (p > .05). MQ and %Fat were significantly related (r = -.20, p = .04). Controlling for age and %Fat, MQ was related to all three measures of LEPF (r range = .44 to .40, all p < .05). Controlling for age and MQ, %Fat was related to UpGo and CHR (r = .30 and -.33, respectively, both p < .05). When grouped via PPT performance [low (<30), moderate (31-33), or high (>33)], better function was associated with greater MQ in a sequential manner (all p < .05); however, PPT group did not differ in %Fat (p > 0.05). We conclude that both MQ and %Fat contribute to LEPF in older women, independent of habitual PA. However, MQ has a stronger relationship to LEPF across functional levels whereas %Fat does not appear to influence LEPF in a graded manner; thus, MQ may be a more important target for exercise interventions than adiposity to preserve LEPF in older women. Keywords: Physical Activity, Muscle Quality; BMI; Adiposity; Functional Status.

COMPREHENSIVE CARE ENHANCES SELF-CARE ABILITY AND DECREASES EMERGENCY ROOM VISITS FOR OLDER TAIWANESE PATIENTS

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Background: Little evidence is available on the effects of intervention models containing both hip fracture-specific care and management of malnutrition, depression, and falls. Whether a comprehensive approach is more beneficial to older patients with hip fracture is still unknown. Objectives: To explore the 2-year effects of an interdisciplinary, comprehensive care program for elderly patients with hip fracture. Methods: A Randomized experimental design was used. A 3000-bed medical center in northern Taiwan. Patients with hip fracture (N = 299), randomized to three groups: comprehensive care (n = 99), interdisciplinary care (n = 101), usual care (control) (n = 99). Usual care included only 1 to 2 in-hospital rehabilitation sessions without in-home rehabilitation, discharge planning, geriatric assessment or consultation. Comprehensive care integrated interdisciplinary care, which included geriatric consultation, continuous rehabilitation, and discharge planning, with nutrition consultation, fall prevention, and depression management. Patients’ self-care ability was measured as performance of daily living (ADLs) and instrumental ADLs (IADLs) using the Chinese Barthel Index and Chinese version of Lawton and Brody’s (1969) IADL scale, respectively. Outcomes were assessed at 1, 3, 6, 12, 18, and 24 months following hip fracture.

Results: During the first 2 years following hip fracture, patients in the comprehensive care group had better performance trajectories for ADLs and IADLs, and fewer emergency room visits than patients in the usual care group. Comprehensive care did not significantly affect patients’ mortality rates and hospital readmissions. Conclusion: Comprehensive care may improve self-care ability and decrease emergency room visits for elders up to 2 years after hip-fracture surgery. Our results may provide a reference for health care providers in countries using similar programs with Chinese/Taiwanese immigrant populations. Keywords: Fractures; Health Care Professionals; Comprehensive Care.

PERCEIVED ENVIRONMENTAL BARRIERS IN OLDER PATIENTS RECOVERING FROM HIP FRACTURE

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Objectives: To study effects of a multidisciplinary intervention, aiming to improve mobility and function in hip fracture patients, on perceived environmental barriers. Methods: Secondary analyses of a randomized controlled trial of physical rehabilitation in community-dwelling hip fracture patients (ISRCTN53680197). Assessments at baseline (on average 70 days after trauma), 3 and 6 months later included perceived housing-related barriers (indoor/outdoor stairs, steps, lighting, floor surfaces and storage for mobility devices) and perceived barriers in the outdoor environment (streets in poor condition, hilly terrain, long-distances, lack of resting places, noisy traffic, and dangerous crossroads). Sum scores (range 0-6) for housing-related and outdoor barriers were computed and analyzed using mixed methods.

Results: The intervention (n = 39) and control (n = 39) group did not differ on baseline characteristics (Table1). Patients in the intervention group perceived more barriers related to housing and outdoor environment at baseline than the control group. Preliminary analyses did not show a significant effect of the intervention on sum scores of perceived barriers related to housing (p = 0.865) or outdoor environment (p = 0.602; Figure1). Conclusion: Preliminary analyses did not show a significant intervention effect on sum scores of perceived housing-
related and outdoor barriers. Hip fracture patients experience large improvements in mobility in the first months after hip fracture, also when not exposed to an intervention. Improved mobility will theoretically reduce perceived barriers, while moving outdoors more frequently may predispose people to environmental barriers. In addition, the seasons in Finland may affect perceived barriers (e.g. related to terrain) as well as frequency of moving outdoors. Intervention effects on separate items as well as confounding effects of aforementioned factors will be further studied. References: 1) Sipilä et al. BMC Musculoskelet Disord 2011;12:27. Keywords: Hip Fracture; Intervention; Environment; Barriers; Mobility.

PHYSICAL ACTIVITY, FITNESS AND FATNESS: INTERACTIVE IMPLICATIONS FOR PHYSICAL FUNCTION AND QUALITY OF LIFE IN OLDER ADULTS

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Aging and concurrent declines in physical activity are associated with increased risks for obesity and physical disability. In the United States, individuals aged 60 and over are more likely to be obese than younger adults with ~ 42% of older women being obese. Management of obesity in older adults is challenging as weight loss also causes bone and muscle mass loss, thereby increasing risks for osteoporosis and sarcopenia. Beyond physical health, obesity can also compromise psychosocial health status reducing vigor and quality of life. Physical activity is an established key to weight management, enhances physical function, and positively impacts psychosocial health in older adults. However, the interactive effects of physical activity, body composition (fat and muscle mass), fitness (musculoskeletal and neuromotor), and physical and psychosocial function are not clearly delineated. Moreover, health status may alter the relations among the aforementioned variables in that physical function may be most impacted by musculoskeletal and neuromotor fitness in frail individuals whereas adiposity may be the primary predictor in higher functioning older adults. The objective of this symposium is to highlight the contemporary literature regarding: a) weight management guidelines for older adults, b) the interactions among physical activity, fitness (muscle strength, endurance and power; neuromotor control), body composition (fat and skeletal muscle mass), and physical function within the context of health status; c) the negative implications of obesity on psycho-social health and the utility of physical activity to enhance quality of life even in the presence of excess adiposity; and, d) statistical considerations when conducting research in this area to isolate the physical activity, fitness and body composition effects on physical function. Our symposium, similar to the disease of obesity, is multi-faceted and will use an integrated and interdisciplinary approach. Keywords: Sarcopenia; Physical Activity; Fitness; Obesity; Musculoskeletal.

HIGH VEGETABLE INTAKE IS ASSOCIATED WITH LOWER FRAGILITY FRACTURE RATE IN POSTMENOPAUSAL ELDERLY TAIWANESE WOMEN

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Chang Gung Memorial Hospital, Taiwan

Objectives: Osteoporosis-related fragility fracture is a major health issue in older adults. This study was developed to investigate the relationship of lifestyle factors with fragility fracture prevalence in postmenopausal Taiwanese women. Methodology: A cross-sectional study, conducted during September 2008 and December 2009 in the community in western Chiayi
County in Taiwan. Postmenopausal women in the community with a mean age of $66.7 \pm 8.6$ years, ($n = 1050$). A structured questionnaire collected personal data, lifestyle information and fracture history. Fragility fractures were defined as those resulting from low energy impact. Laboratory examinations provided biochemistry data. The relationship between fragility fracture prevalence and other variables was analyzed. **Results:** The overall prevalence of fractures of all etiologies and fragility fracture were 18.7% and 9.7%, respectively. Wrist was the most common site of fragility fracture (48 cases). Fragility fracture prevalence in subjects who rarely or did not consumed deep-colored vegetables was significant higher than that of those who often consumed deep-colored vegetables: $17.6\%$ versus $9.0\%$, with an odds ratio of $1.96$ (95% CI: 1.05-3.68) by multivariate logistic regression analysis. **Discussion and Conclusion:** Intake of deep-colored vegetables was significantly associated with a decreased risk of fragility fracture. Long-term intake of deep-colored vegetables should be encouraged in populations at risk for fragility fractures. **Key words:** Osteoporosis, Fragility Fracture, Nutrition, Taiwan.

**DISTRACTION AS CAUSE FOR FALLS: DIFFERENCES BETWEEN SUBGROUPS OF OLDER ADULTS**

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**Background:** Subgroups of older people (i.e. single vs. recurrent fallers, indoor vs. outdoor fallers) have been identified which differ with respect to physical and cognitive capacities. However, it is unknown whether self-reported dual tasking at the time of a fall is associated with cognitive and physical function in older people. **Methods:** Independent living older adults ($n = 105, 79.5\pm4.8$years) underwent a series of physical and cognitive function tests. Fallers ($\geq 1$falls in past 12 months) were categorised as “distracted” fallers when they reported a dual task/distraction as the dominant cause of the fall or as “not distracted” fallers when they did not. **Results:** Thirty participants (28.6%) fell in the year prior to assessment, 10 distracted and 20 not distracted fallers. ANOVA with Tukey post-hoc tests and multiple regression analysis (adjusting for education as appropriate) showed significant differences ($p < 0.05$) or trends ($p < 0.10$) indicating the not distracted participants performed worse than the distracted fallers in tests of physical performance (Physiological Profile Assessment ($p = .009$), sway ($p = .091$), Timed-up & go ($p = .014$)) and cognitive function (Trail making B-A test ($p = .049$)). These differences could not be explained by differing proportions of recurrent fallers between groups. There were no differences between the non-fallers and distracted fallers in any test. In contrast, the not distracted fallers differed from the non-fallers in nearly every measure. **Conclusions:** The findings indicate different characteristics between distracted and not distracted fallers categorised by a self-report measure of dual tasking at the time of falling. The use of these subgroups may improve diagnostic accuracy of assessments and provide direction for fall prevention strategies. **Keywords:** Dual Tasking; Cognitive Function; Faller; Distraction.

**POOR PERFORMANCE IN A TEST OF SELECTIVE ATTENTION, RESPONSE INHIBITION AND STEPPING IS ASSOCIATED WITH FALLS IN OLDER PEOPLE**

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**Background:** Previous studies have shown that older fallers have poorer cognitive function than non-fallers. We developed a test that combines stepping with selective attention.
and response inhibition to provide a functional measure that reflects complex real life scenarios. We aimed to determine whether this test discriminates between older fallers and non-fallers. **Methods:** 102 older adults (79.4±4.9 years) without cognitive impairment (MMSE 28.9±1.1) completed an inhibitive step task (INHIB) using an exergame device. In the centre of a computer screen (58cm) an arrow was presented pointing in one of four directions (up, down, left, right). Inside the arrow was a written word indicating a different direction. In 20 trials, participants had to step according to the word and inhibit the response indicated by the arrow’s shape. Participants also underwent a range of tests of physical and functional performance (timed up & go (TUG), alternate step (AS), 5 Sit-to-Stand (5STS), choice stepping reaction time (CSRT)) and cognitive function (Color Word Stroop test (CW-Stroop), Trails A&B, digit symbol (DS). Participants who reported one or more falls in the past 12 months were classified as fallers. **Results:** Participants who took longer to complete INHIB had fewer correct items in the CW-Stroop test (r = -0.337) and performed poorly in the other cognitive tests. (DS r = -0.393, Trails A r = 0.344, Trails B r = 0.370). These participants also had worse functional performance (TUG r = -0.457, AS r = 0.480, 5STS r = 0.438, CSRT r = 0.620). Univariate logistic regression indicated that participants who performed poorly in the INHIB were at increased odds of falls (OR = 2.90 (1.12-7.49), p = 0.028) with an overall correct classification of 73%. **Conclusions:** INHIB, a test that combines stepping with selective attention and response inhibition, was able distinguish fallers from non-fallers, providing further evidence for cognitive mechanisms on fall risk in older people. **Keywords:** Faller; Non-Faller; Cognition; Attention; Response Inhibition.

“HELP THE HELPERS”: PERCEPTIONS OF LOCAL VOLUNTARY WORKERS TEAMS ABOUT A COMPREHENSIVE HEALTH PROMOTION PROGRAM

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**Introduction:** “Please don’t fall” is the biggest community intervention project directed towards the health promotion of the Azorean aging population. Its first edition lasted 11 months and relied on the clinical expertise of an interdisciplinary healthcare team (physiotherapists, nutritionists and nurses) that monitored 45 min physical exercise classes twice a week and monthly health educational workshops. These actions took place in community-based centers. Teams of voluntary workers work in those centers to help their fellow elderly citizens. **Aim:** The aim of this survey was to explore the voluntary workers’ perception and satisfaction with a comprehensive health promotion program. This survey was planned to assess self-perceived benefit and perceived benefit for the elderly population, not objective benefits. **Methods:** 87 voluntary female workers of the participating community centers (Angra do Heroismo, Portugal) were asked to participate in a interview in order to verify their satisfaction with the project, as well as their perceptions of the impact it had on the elderly population. **Results:** 50,6% (44) agreed that the program met the needs of the elderly; 63,5% (54) said it contributed to the good functioning of the centers; 50% (43) agreed that it helped their voluntary work. 49,4% (42) scored the organization of the project as “very good”; 53,4% (43) scored the work developed by the physiotherapy team as “very good.” The intervention of the nutrition team was “good” for 51,9% (43), while 44,6% (37) thought the nurses’ work was also “good.” 54,4% (43) believed that the program had contributed to the old people’s wellness. 55% (46) agreed that the elderly were more motivated than before to play an active role on the regular activities of the center. The majority of the voluntary workers 42,68% had the opinion that this comprehensive program was “good.” **Conclusion:** The
AN AZORIAN OPINION SURVEY OF THE SELF-PERCEIVED IMPACT OF A COMPREHENSIVE HEALTH PROMOTION PROGRAM

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“Please don’t fall” is the biggest community intervention project directed towards the health promotion of the Azorean aging population. Its first edition lasted 11 months and relied on the clinical expertise of an interdisciplinary healthcare team (physiotherapists, nutritionists and nurses) that monitored 45 min physical exercise classes twice a week and monthly health educational workshops. **Aim:** The aim of this survey was to explore Azorean old people’s perception and satisfaction with a comprehensive health promotion program. This survey was planned to assess self-perceived benefit and not objective benefits. **Methods:** 675 aging citizens of Angra do Heroismo (Azores, Portugal) who participate in a major health promotion program were contacted through their local community center and asked to participate in an interview in order to verify their satisfaction with the project, as well as its impact on their daily life. **Results:** 342 participants were lost to follow up. 333 participants were interviewed. Among the reasons for participating in the program 55.58% (120) referred the Pnf-Chi exercise sessions. Most participants enjoyed the health activities a lot[53.6% (177) Pnf-chi classes, 66.1% (119) water physical exercise sessions, 54.5% (165) health education sessions, 49.8% (154) nutritional education sessions]. 72.5% (166) said the same about the parallel social activities. When asked about their overall status after participating on the program, 91.5% (292) participants felt more interested about life, 90.3% (288) were happier. 40.3% (131) were moving better and 70.2% (239) were more satisfied with life. A majority of 46.3% (161) participants reported that the program was overall “very good” whilst “40.5%” (141) classified it as “good. **Conclusion:** The interviewees perceive benefit from and are overall satisfied with the comprehensive “please don’t fall” program. This may represent a positive impact on a biopsychological level. **Keywords:** Health Promotion; Volunteering; Benefits; Community Intervention.

A COMMUNITY EXERCISE GROUP FOR OLDER PEOPLE WITH MENTAL HEALTH CONDITIONS TO PROMOTE PHYSICAL ACTIVITY, FALLS PREVENTION AND SELF-MANAGEMENT

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**Purpose:** To provide an opportunity for older people with a mental health illness to experience the positive effect of exercise in a community-based environment, in order to improve fitness; reduce long term risk of falls and help maintain/improve mental health and wellbeing. At the end of the programme, individuals were then supported in accessing and attending ‘main-stream’ community exercise groups. **Relevance:** Research states this patient group significantly benefits from taking regular exercise to help reduce risk of falling, increase confidence, encourage social inclusion and maintain independence at home by promoting self-management. However, clinical experience has shown that patients rarely access ‘main-stream’ community exercise groups due to low confidence, poor physical functioning and
anxiety. This evidence-based programme was designed to bridge the gap in service and provide a time-limited community-based exercise group to improve physical fitness and increase the uptake of mainstream community exercise groups for these patients. **Description:** 12-week exercise group incorporating resistance, aerobic and balance exercises and Tai Chi. Home exercises including strengthening and walking three times a week. At the end of the programme, participants met individually and suitable follow-on mainstream community exercise groups discussed with initial support provided in attending the groups. **Conclusions:** Attendance/completion rate high with the majority of participants moving on to mainstream exercise groups. Outcome measures showed improved confidence, balance and physical activity levels. **Implications:** This self-management model enables older people with mental health problems to receive increased support in improving their physical fitness/confidence to then be able to access mainstream exercise groups and maintain a level of independence and social inclusion. **Keywords:** Mental Health; Physical Activity; Falls Prevention; Self-Management.

**THE FUNCTIONAL MOVEMENT CIRCLE FOR ELDERLY (FUMOC-E): A MULTIFACTORIAL INTERVENTION TO AFFECT FALL-RELATED RISK FACTORS**

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**Introduction:** Loss of muscle strength and power, gait and balance disturbances are well known as risk factors for falls in the elderly. Especially in everyday movement situations (uneven surface, stumbling on carpets or stair climbing) fall risk arises. The FuMoC-E involves everyday movement routines inside a track embedded in a balance and strength training. The goal of this study was to determine the effects of this new training concept for elderly on fall-related risk factors. **Methods:** Eighteen healthy, community-dwelling older adults aged 61 to 81 years participated in the FuMoC-E pilot study. They trained twice a week for 60 min each training session for 12 weeks using two balance, six strength exercises and the everyday life movement track. Isometric and dynamic strength, gait velocity, balance, and several functional performance tasks were assessed before and after the 12 weeks of training. **Results:** Dynamic strength for chest press (15%; p < .001) and timed-up-and-go (8%; p < .001) improved significantly. Furthermore, habitual gait velocity (9%; p = .011) and maximum step length (right: 6%; p = .014; left: 7%; p = .011) increased significantly with training. 12 weeks training with FuMoC-E improved also maximum gait velocity, balance, chair stand performance, isometric and dynamic strength. **Conclusions:** FuMoC-E positively influences fall-related risk factors of elderly subjects. The improvements observed in this study could be enlarged by longer intervention duration (6 months). This pilot study was feasible in recruitment, assessment, and training implementation. However, a larger randomized controlled trial is needed to investigate mechanisms of benefit and long-term efficacy of this new training program. **Keywords:** Falls; Risk Factors; Intervention; Balance; Strength.

**THE EFFECT OF PHYSICAL ACTIVITY AND NON-PHYSICAL LEISURE ACTIVITY ON AGING WELL**

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Aging well is defined as “positive, person-centered process in which the promotion and protection of physical, mental, social, economic, and daily life styles are paramount for achieving a sense of satisfaction, health, dignity, and well-being in old age” (Hawkins, 2000). It is well established that physical and non-physical leisure activity are related to positive outcome including health outcomes, well-being, successful aging and mortality risk for older adults. A little researches, however, has been done about which activities more contribute to aging well or successful aging. The purpose of the study was to examine the difference in aging well among older adults who participate in both physical and non-physical leisure activities, only physical activities, only non-physical activities, and no activity. The study used secondary data from Aging Well: A Study of Adult Well-Being, which was part of the Global Aging Initiative (2004). Data includes individuals ranging in age from 50-92 years. This study used ANOVA analysis with a post-hoc test to examine the difference in aging well among older adults participating in different type of activities. The study found that older adults who actively participated in physical activity or non-physical leisure activity had high level of aging well. Especially, those who participate in both physical and non-physical activity showed higher aging well scores. The study confirms the importance of physical activity as well as non-physical activity to aging well for older adults. Older adults who participate in both physical and non-physical leisure activities were more likely to be aging well. Keywords: Wellbeing; Physical Activity; Leisure Activity; Aging Well.

DIFFERENT MODES OF EXERCISING, FITNESS, MOOD AND FATNESS IN OLDER ADULTS

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Aim: Physical independence and positive mood states contribute to successful aging. The purpose of the present study is to analyze the effects of aerobic and strength-based training programs on functional fitness and mood states in older adults, and to assess the relationship between adiposity and mood. Methods: Seventy-eight older adults (age 65 to 95 years old) were randomly assigned to a control group (C), aerobic training (AT), or strength training group (ST). Functional fitness was assessed with the Senior Fitness Test battery relating to lower and upper body strength and flexibility, velocity, agility and dynamic balance, and aerobic endurance. Mood states (depression, tension, fatigue, vigour, anger, and confusion) were determined using the POMS-SF questionnaire. Participants were evaluated at the baseline and at the end of a 16-week exercise programme. Results: Both the ST and AT groups improved their functional fitness following the 16 week training. Body mass index (BMI) was positively associated with tension (r = 0.30; p < 0.01), fatigue (r = 0.31; p < 0.01) and confusion (r = 0.24; p < 0.05). At 16-week evaluation, control group reported increased levels of confusion, and the ST group reported increases in vigour (p < 0.05). Conclusions: Results support the idea that strength-based training can be as effective as aerobic-based training in improving physical skills that contribute to functional mobility in later years. Positive associations between increased BMI and mood disturbance were also found. Physical training also contributed to some improvements in mood. Keywords: Strength; Training; Obesity; Physical Activity; Mobility.
DISABILITY AMONG OLDER ADULTS IN SPAIN: THE SIZE OF THE POPULATION

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The aim of this study was to determine the relationship of population size with functional disability in activities of daily living (ADLs). This cross-sectional study used data from The Survey of Older Adults by “the Institute Of Aging And Social Services” (IMSERSO) in 2010. 2,535 individuals, 50.5% men and 49.5% women, aged ≥ 65 years, distributed in 17 regions of Spain, were interviewed by phone. The ADLs were measured by questions related to the difficulties in carrying out household chores and personal care (use of ladders, bathing, toilet use, pick up objects in the kitchen, washing clothes and extending). The sum of the responses was categorized into three levels of dependence. The size of the municipality was classified in extracts (<10,000, ≥10,000 and <100,000, and >100,000 inhabitants). In the data analysis we used the chi-square, p < 0.05. The prevalence of independent people or with mild dependence was 13.6% (n = 346) and severe dependence was 66.8% (n = 1694). In relation to the size of the municipality, 39.4% (n = 1000) lived in cities with population < 10,000 and 21% (n = 532) in cities with population > 100,000. There is a relationship between the variables (χ² = 29.07 p < 0.0001). The smaller cities had a higher prevalence of independent elderly (n = 167), while the larger municipalities had a population prevalence of approximately 50% less severe dependence when compared to other groups. Furthermore, it is concluded that there is a high prevalence of functional dependence in elderly Hispanics. Implementation of interventions in population and the size of the municipality must be observed so that the assistance and intervention mode meet the needs and characteristics of residents. Keywords: Functional Disability; Measurement of Activity; Independent Living; Population; Spain.

PERCEIVED STRESS AND PHYSICAL ACTIVITY LEVELS IN ETHNOCULTURAL LOW INCOME OLDER ADULT POPULATIONS IN TORONTO, CANADA

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Background: little is known about the influence of stress levels on physical activity among ethnically diverse older adults. Purpose: The objective of the present study was to determine whether perceived stress is a determinant of physical activity among an ethnically diverse group of older adults living in an urban center in Canada. Methods: Data from an ongoing intervention study was used for purposes of the current analysis. Participants were men (n = 29) and women (n = 127) between the age of 55-87 who lived in low-income urban neighbourhoods. Upon recruitment in the study, all participants completed the Perceived Stress Scale (PSS), the Healthy Physical Activity Participation Questionnaire (HPAP-Q) and provided relevant demographic information. Multiple linear regression models were performed using physical activity as the dependent variable and PSS as the main independent variable. Age, sex, marital status and education were included as covariates in the regression model. Results: Variables in the full model were able to explain 10% of the variation in physical activity levels. A significant and negative association between perceived stress level and physical activity was obtained (beta = - 0.1, p < 0.01). Conclusion: Perceived stress
is a determinant of physical activity levels among ethnically diverse older adults. As such, focusing on decreasing stress level in this population may be essential for lifestyle change. **Keywords:** Stress; Physical Activity; Ethnoculture; Income; Urban.

**WHAT DOES SOCIAL PARTICIPATION MEAN FOR HEALTHY HOMEBOUND OLDER ADULTS?**

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**Introduction:** Active engagement with life is one of factors of the theory of successful aging. Social participation is also a significant strategy proposed by WHO to facilitate people’s good old age and active aging. However, is participation the only way to promote a good old age? To raise the low rates of social participation of older adults in Taiwan and to better facilitate people’s successful aging, the purpose of the study was to explore the perceptions of social participation for older adults who were healthy and preferred to be homebound and to find their own strategies of aging well. **Methods:** A qualitative design was adopted to explore the subjective perspectives of the older adults. By means of in-depth interviews, the participants were 12 older adults who were (1) 60 or more, (2) never participated in volunteering in their life and have no employment and no learning one year before the interviews. **Results:** The findings showed that older adults perceived social participation as a good thing for senior to kill time easily as well as a symbol of being healthy. Their not participating might result from personality, feeling no need, previous impressions of social participation, and other things occupying their time. Also, those healthy homebound seniors regarded different kinds of social participations differently. Among being employed again, doing volunteerism, and participating in learning, most of the interviewees perceived being employed as the most favorite one of social participations. **Discussion:** The findings also point out that older adults’ low social participation was influenced by negative stereotypes of older adults and old age. **Keywords:** Aging well; Social Activities; Active Engagement; Homebound.

**CHANGES IN PHYSICAL ACTIVITY IN THE RETIREMENT WINDOW: A THEORY-BASED INTERVIEW STUDY**

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Older adults are the most sedentary segment of the population. The retirement window may provide an important opportunity to deliver interventions to increase physical activity however little is known about the determinants of physical activity in the retirement window and how physical activity and its determinants may change during the retirement transition. The study aimed to identify theoretically linked facilitators and barriers to physical activity behaviour perceived by participants by participants who were within 18 months pre or post retirement. Participants were interviewed using a theory-based interview designed to elicit perceptions of physical activity. The interview covered the 11 behavioural domains identified within the Theory Domain Framework (Michie et al., 2005) that have potential to explain to explain physical activity behaviour. Interviews were audio-recorded, transcribed verbatim and coded to identify core beliefs about physical activity. The most frequently reported facilitators for physical activity were within the behavioural domains ‘beliefs about consequences’, ‘motivation & goals’ and ‘environmental context’. The most frequently reported barriers to physical activity were within the domains ‘beliefs about capabilities’
and ‘emotions’. Retired and non-retired participants reported actual or anticipated changes in physical activity which were most frequently related to having more time (‘beliefs about capabilities’) to do physical activity after retirement. The findings from this study suggest that future interventions designed to increase physical activity targeting individuals within the peri-retirement window should focus on these theory-based determinants of physical activity behaviour. **Keywords:** Retirement; Physical Activity; Barriers; Behaviour.

**LIFESTYLE REDESIGN: CAN A PREVENTIVE OCCUPATIONAL THERAPY APPROACH IMPROVE THE HOSPITAL TO HOME INTERFACE FOR OLDER PEOPLE?**

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Increasing pressure on health and social care services due to the changing population demographic has resulted in development of policy that emphasises wellness, prevention of illness and delivery of community based services. Reducing hospital admissions, length of stay and improved outcomes for older people are key factors. Lifestyle Redesign®, an innovative approach developed in the USA, has produced convincing evidence through randomised controlled trials that occupational therapy (OT) can provide sustained, cost effective improvements in the health and wellbeing of older people that reduce use of health and social care services. A Winston Churchill Memorial Trust travel award provided the opportunity for an OT from NHS Dumfries & Galloway, Scotland to spend 8 weeks at the University of Southern California, USA with Dr Florence Clark and the research team who designed and continue to develop the Lifestyle Redesign® approach. The aim of the visit was to investigate how Lifestyle Redesign® could be used to improve outcomes for older people at the hospital/home interface. OTs view occupation- all that an individual needs and wants to do in their life- as central to the achievement and maintenance of health and wellbeing at every stage of life. The skills of OTs have traditionally been used in rehabilitation or recovery work. OTs trained in Lifestyle Redesign® facilitate clients through a process of making self-directed changes to their lifestyle and daily routines that are personally meaningful, health promoting, sustainable and enhance quality of life. The presentation will discuss the findings of the study visit and examine the case for the use of the approach by OTs to improve the hospital/home interface. Use of this OT intervention has the potential to make a significant contribution to the national healthcare agenda and to significantly improve outcomes for older people at a vulnerable time in their lives. **Keywords:** Occupational Therapy; Prevention; Home Interface; Wellbeing.

**ASSOCIATION BETWEEN BONE MINERAL AND FUNCTIONAL CAPACITY IN BRAZILIAN SUBJECTS AGED 80 YEARS OR OLDER**

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**Introduction:** Aging is a gradual and progressive process that is accompanied by decrease in bone mineral content (BMC), bone mineral density (BMD) and functional capacity. **Objective:** To analyze the association between bone mineral content and bone mineral density with functional capacity in subjects aged 80 years or older. **Methods:** The sample was composed by 93 subjects aged 80-91 years (83.2±2.5y), being 61 women (83.3±2.7years) and 32 men.
(83.1±2.2 years) living in Presidente Prudente-Sao Paulo/Brazil. The Dual-energy X-ray Absorptiometry (DEXA) was used to assess the BMC and BMD of the femur and spine(T1-T4). The functional capacity was assessed by walking speed tests, static equilibrium and strength of lower limbs, according recommendation contained in the Wellness Health and Aging questionnaire. The BMC and BMD and functional capacity were categorized according to the median values and score tests, respectively. The association between variables was carried out by chi-square test, the software used was SPSS, version 17.0(p < 0.05).

**Results:** The femur BMC was the only variable that presents significant correlation with all performance tests (p < 0.0001). The other correlations did not showed statistical significance with performance tests.

**Conclusion:** The femur bone mineral content in the male subjects was the most associated with the functional capacity. **Keywords:** Bone Mineral; Functional Capacity; Bone Mineral Density; Brazil.

### EFFECT OF CONCURRENT TRAINING ON BODY COMPOSITION AND BONE MINERAL DENSITY IN POSTMENOPAUSAL WOMEN

**Introduction:** Aging and menopause are independent risk factors for the development of obesity and osteoporosis, and these risks increase when associated with sedentary lifestyle.

**Objective:** To investigate the effect of concurrent training on body composition and bone density in postmenopausal women. **Methods:** Sample consisted of 94 postmenopausal women, aged 50-75 (61.4±6.9) years, from Presidente Prudente, Sao Paulo-Brazil. The participants were distributed in three groups: training group (TG): performed only concurrent training during eight weeks, three times/week; training+diet group (TDG): performed the same concurrent training with supervised food ingestion, and control group (CG): did not train or diet. Total fat mass (FM),% of body fat (%BF),fat-free mass (FFM), trunk fat mass (TFM) and bone mineral density (BMD) were estimated by Dual Energy X-ray Absorptiometry (GE Lunar DPX-NT). The intervention period lasted eight weeks, and consisted by the combination of 50-min strength training followed by 30-min aerobic exercise. The training prescription followed the recommendations of the ACSM (2002). The caloric intake followed the recommendations of the AHA (2000). The comparison between periods, before and after training, was made using the Student’s t test for paired variables. All statistical analysis was performed using SPSS, version 17.0 (p < 0.05).

**Results:** The comparisons between both moments, before and after intervention, showed that the TG presented significant decrease in the FM (p = 0.043),%BF (p = 0.010), and improvement in the FFM (p = 0.003). The CG presented significant decrease in the BMD (p = 0.001). No significant differences were observed in the TDG. **Conclusion:** Concurrent training without diet was effective to decrease fat mass and% of body fat, and increase fat-free mass. These results were not observed in the other two groups. **Keywords:** Bone Mineral Density; Postmenopausal Women; Diet; Body Fat.

### COMPARISON OF TWO DOSES OF AN EXERCISE INTERVENTION ON MOBILITY AND FUNCTION IN OLDER ADULTS

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**Purpose:** The purpose of the present study was to compare the effect of varying frequency of the FallProof™ intervention on function and mobility. **Methods:** Participants (n = 23; mean age = 79.1, one male) with mild-moderate mobility impairment were recruited from a local residential retirement community and randomly assigned to one of two intervention groups, 1 day group (1D, n = 12), or 2 day group (2D, n = 11), utilizing the FallProof™ program. The exercise program was conducted for 16 weeks, with baseline, 8 week and 16 week assessments of the Berg Balance Scale (BBS), 8 foot Up and Go (UG), 50-foot walk test and 30-sec chair stands. The Motor Fitness Scale (MFS) and Late Life Function and Disability Instrument (LLFDI) questionnaires were administered pre and post intervention. **Results:** Of the 23 participants that began the intervention, 19 completed 8 weeks and 14 completed all 16 weeks. There was no difference in adherence to the protocols between groups for either those that completed 8 weeks (p = .45) or 16 weeks (p = .92). Significant improvements were observed on the BBS and UG, respectively, for both the 1D (49.9 to 52.4, p < .05; 8.7sec to 6.9sec, p < .05) and 2D (45.1 to 48.7, p < .05; 10.9sec to 8.9 sec, p < .05) groups from baseline to 16 weeks. A significant difference was observed between the groups on the Motor Fitness Scale at 16 weeks (1D = 9.7 + 2.1, 2D = 6.0 + 2.4; p < .01). **Conclusion:** These results suggest that the FallProof™ exercise program, offered one day per week, can achieve improvements in the BBS and UG similar to two days per week. Small sample sizes prevent broad generalization of the effectiveness of the FallProof™ program offered 1 day per week, so further research is needed, utilizing larger and more diverse samples. Nevertheless, these results support the potential for cost effective adoption of the FallProof™ program, offered one time per week, among retirement communities and senior centers. **Keywords:** Exercise; Intervention; Technology; Mobility.

**THE RELATIONSHIP BETWEEN THE LATE LIFE FUNCTION AND DISABILITY INSTRUMENT AND BERG BALANCE SCALE**

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**Introduction:** The Berg Balance Scale (BBS) has been shown to be reliable for predicting fallers, however a limitation of the BBS is that it requires significant training and one on one supervision to administer the test which consists of 14 tasks that are scored from 0-4 for a total of 56. The Late Life Function and Disability Instrument (LLFDI), developed to predict who is at risk for disability, provides a composite score of basic lower extremity function and advanced lower extremity function. Since it is a questionnaire, it requires less training and can be administered in a one to four ratio in most settings. For many retirement communities the cost to administer the BBS would prohibit its use, whereas the LLFDI could be administered at a much lower cost per resident. **Purpose:** To compare the baseline results of the BBS and LLFDI which were both utilized in an intervention study aimed at improving mobility and balance in older adults. **Methods:** The BBS and the LLFDI were administered, by researchers appropriately trained to use both approaches, at baseline. Subjects (n = 20: 1 male, 19 female) were residents of an independent living retirement community (age 67-91, mean 78). **Results:** The mean score for the BBS at baseline was 46.3 (SD 7.9). The baseline LLFDI basic lower extremity function mean score was 57.95 (SD 8.6). The advanced lower extremity function mean score was 35.3 (SD 16.4). A moderate relationship was observed between the BBS and the basic lower extremity score from the LLFDI (r = .65, p = .002). The relationship was also moderate (r = .71, p = .0001), when comparing
the BBS to the advanced lower extremity score for the LLFDI. **Conclusion:** These results suggest that the LLFDI may provide an alternative screening approach to the BBS, which can be more costly and time consuming to administer, for those considered at high fall risk and in need of a full prevention program. **Keywords:** Berg Balance Scale; Falls Prediction; Screening; Disability.

**THE EFFECT OF A WITHOUT-WEIGHT-BEARING WALKING INTERVENTION ON BONE MINERAL DENSITY**

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**Background:** Previous studies have found that walking could have positive effects on maintaining Bone Mineral Density among postmenopausal women. However the majority of this group tends to be sedentary. Barriers to maintaining regular physical activity among postmenopausal women are found to be the lack of accessibility of physical activity facilities and the convenience and safety of the mode of physical activity. Walking is viewed as an easy, less costly physical activity and could be adopted with limited time and location. **Objective:** Aims to examine the effect of a 12-week walking intervention, without weight bearing, on maintaining BMD among postmenopausal women. **Methods:** A randomized controlled trail design was used to test the effect of the walking intervention. Participants were recruited from an east township of Taiwan. A total of 57 participants was randomized to either a control (n = 28) or intervention group (n = 29). Control group participants received a usual care when needed. Participants in intervention group received a 12-week, without-weight-bearing walking intervention. **Results:** At 12th week follow up, mean change of BMD was similar in two groups (p = .5). Aerobic steps were increased in intervention group. Scores of exercise self-efficacy and exercise outcome expectation were also improved significantly. **Conclusions:** A 12-week, without-weight-bearing walking intervention may increase postmenopausal women’s physical activity, exercise self-efficacy and exercise outcome expectation but the effect on maintaining BMD was not found. Future study testing the effect of longer period, without-weight-bearing walking intervention or vice-versa on maintaining BMD is warranted. Only then maintaining or improving BMD through walking activity among postmenopausal women could be feasible. **Keywords:** Bone Mineral Density; Walking; Intervention; Self-Efficacy.

**DELIVERING ON PREVENTION AND ANTICIPATORY CARE: A REVIEW OF THE REGISTRATION SYSTEM FOR BLIND AND PARTIALLY SIGHTED PEOPLE IN SCOTLAND**

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**Introduction:** Research has predicted that the impact of an ageing population on the prevalence of sight loss could see the number of people with serious sight loss in Scotland rising to almost 400,000 by 2031. Despite an ageing population and increasing incidence of sight loss, new registrations fell by 7%, suggesting that the current registration system is not fit for purpose and fails to connect with people at the right stage. **Methods:** A review of the literature and evidence on the current registration process in Scotland was conducted. The views of service providers within the hospital eye services (HES); Local Authorities and Local Sight Loss Societies were sought across Scotland. In addition, two focus groups were
Conclusions: There is a clear case to modernise the current system. The proposed changes would significantly improve anticipatory care through initiating early access to assessment, information and support services. This would also enable people, particularly older people, to live more active and independent lives. The changes would also prevent unnecessary or avoidable health and social care interventions in line with current Scottish Government policy. Through shifting the focus from Ophthalmology to Optometry, it would represent a shift in the balance of care from acute to community, ensuring that the process was more efficient and would automate the distribution, storage and recovery of the information collated. Recommendations: 1. Review the clinical criteria currently used to register people as blind or partially sighted 2. View visual impairment as a long-term condition, moving away from a ‘register’ 3. Implement a system of notification and indexing built into an electronic referral process. Keywords: Prevention; Visual Impairment; Active Life; Scotland.

PERCEPTIONS AND BEHAVIORS OF ROMANIAN ELDERLY CONCERNING HEALTHY AND ACTIVE AGEING
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The aim of our presentation is to reflect perceptions and personal behaviors of Romanian elderly concerning a healthy lifestyle and a healthy and active ageing. Older people are one of the segments of the European population who are more likely to define themselves as in poor health, or long-term ill. Their life quality is affected and much more resources are needed. Life expectancy at birth for the general population of Romania has a slightly increasing trend, reaching 72.7 years. However this is considerably lower than in other countries of Central and Eastern Europe. Among the main causes of death in Romania, cardiovascular diseases are followed by malignant tumors digestive diseases and also some infectious and parasitic diseases from external causes. This is an explorative research focused on the concerns of the Romanian elderly throughout their life-course for a healthy lifestyle and an active and healthy ageing. 28 narrative interviews have been used for data collecting. Perceptions, concerns, habits, options for a treatment in poor health situations, access to health care system, personal and social responsibility, preparedness for a healthy and active ageing were the major topics followed in our dialogs. The narrative and constructivist approaches were been used for analyze and interpreting. Triangulation has been also assured. Promoting and living a healthy lifestyle was not the main concern of all elderly we interviewed. For some of the interviewed people, linking levels of their actual health status with quality of personal ageing becomes surprising. Across their youth and economic active live, a healthy lifestyle has not a major personal choice or topic. As various dimensions of frailty appeared, a much more healthy behavior becomes their main concern. On the bases of the individual ageing process and experiences, a sum of hints for a healthy and active ageing are collected and interpreted. Keywords: Behaviour; Perception; Health; Active Ageing; Romania.

ACTIVE AGEING POLICY DEPLOYMENT IN BISCAY
Murillo Corzo, Sergio; Rekagorri Barreneruxea, Andoni
Bizkaiko Foru Aldundia, Spain

Introduction: On its Plan for the Elderly 2006-2011, Bizkaia Provincial Council stressed that the fostering of Active Ageing was its key priority. The emphasis was on the institutions and society in general working to ensure that “Ageing Actively” was something intrinsic
to lifelong “living actively” as part of a diverse, intercultural and intergenerational society where seniors are treated fairly. Deployment: This political undertaking was embodied in the “Bizkaia Manifesto for Active Ageing,” which was an initial resource to raise awareness of a new life model for seniors. In 2010, a Plan of Action for Active Ageing in Bizkaia was designed to create the optimum conditions to encourage AGE AGEING. Three specific mechanisms were introduced: a) surveying the opinion of political representatives and public sector technicians, b) analysing the development of public policies in terms of their capacity to foster Active Ageing processes and c) setting up a commission within the Seniors Board, a deliberative body with an advisory and consultation role, answering to the Department and which is made up by representatives both from Seniors associations and from institutions. The work pinpointed the challenges to be met: 1) Changing the negative stereotypes about old age 2) Fostering an integral concept of seniors 3) Achieving understanding of the Active Ageing concept 4) Trying to change the integration and participation systems for seniors 5) Encouraging progressive access and getting ready for retirement 6) Fostering socio-economic situations that enable decent ageing To conclude, the Action Plan for Active Ageing with specific actions is currently being assessed. Conclusions: Key factors for success are: 1.Institutional undertaking (top-down approach) 2.Civic society’s involvement in the diagnostic process and plan of action (bottom-up approach) 3.The transversal approach being included in all the policies (inter-disciplinary) 4.Institutional leadership. Keywords: Active Ageing; Health Promotion; Public Sector.

BALANCE EXERCISE CLASS PATIENT QUESTIONNAIRE

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Background: The purpose of the investigation was to quantify patient reported outcomes following participation in balance groups. Balance groups provide targeted exercise to people with a history of falling, a fear of falling, unsteadiness on their feet or osteoporosis. Methods: All patients attending Balance Exercise Programme were asked to complete a questionnaire at the final session and on completion place in a sealed box at reception. All completed questionnaires were sent to the audit department to collate and produce this report on the results. The audit lasted one year. Results: 47 patients in total submitted a questionnaire out of a possible 60. 96% of patients enjoyed attending the group. The patient’s comments were very positive. After attending the group:- 83% of patients felt more flexible; 77% felt more confident when carrying out their daily activities; 70% of patients felt stronger; 66% felt their balance had improved; 53% were happy to do all the exercises at home after discharge; 96% found the challenge of the exercises “just right”; 98% were happy to do at least some of the exercises at home. Discussion: 66% of patients felt their balance had improved. 34% of patients, however, reported no change in their balance. Previous small audits showed objective improvement in patient’s balance following balance groups. The multi factorial nature of balance may make improvements in balance more difficult for patients to notice than for example muscle strength or flexibility. Patients may benefit from more targeted verbal feedback to reinforce their progress in balance exercises. It is important, in future, to obtain qualitative data about patients’ confidence in continuing with the balance component of home exercises in order to ensure they are exercising at an optimal level when unsupervised. Conclusion: The questionnaire provided patient reported evidence of physical improvement following exercise in balance groups Future questionnaires need to ask more specific questions in order to inform further improvements as outlined in the discussion. Keywords: Physical Improvement; Exercise; Intervention; Balance; Strength.
FALL REDUCTION TECHNIQUES IN WATER EXERCISE

Galloway, Melanie F

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Bone density is known to respond best to loading and impact in gravity but those with movement challenges may be advised to exercise in water for cardiovascular conditioning. Swimming requires a skill set; vertical water exercise does not and can be offered to a wide range of fitness levels and age groups. The physiological benefits of vertical water exercise are known but the opportunity to train for fall reduction is rarely considered. Studies have demonstrated improvement in lateral hip stabilisers and core strength when lateral motion is incorporated in upright water exercise. Muscle power, speed, and strength can all be improved using water resistance. Quick direction changes demanding eccentric loading on legs promotes agility and is safer done in the supportive buoyancy of water since falls during practice are unlikely to result in more than wet hair. Reaction speed, arm reach, hand grasp, turning speed, and peripheral visual quickness are all aspects that can be integrated into programs while also promoting heart health and social wellness. There is a need for instructor education specific to fall reduction techniques with methods that can be incorporated into classes at all levels of ability. There is also a need for further water based research investigating ideal approaches for reducing fall risks.

REFINE: REDUCING FALLS IN IN-PATIENT ELDERLY

Avis, Mark1; Vass, Catherine1; Drummond, Avril1; Sahota, Opinder2; Kendrick, Denise1; Grainge, Matthew1; Gladman, John2; Sach, Tracey3

1University of Nottingham, UK; 2University of Nottingham and Nottingham University Hospitals Trust, UK; 3University of East Anglia, UK.

**Background:** In patient falls are an important cause of patient morbidity and a source of additional costs to health care providers and burden to staff. **Aim:** To reduce in-patient falls. **Method:** Individual patient computer randomised control trial recruiting patients admitted to five acute elderly medical care wards in an UK teaching hospital between January 2009 and March 2011. Exclusion criteria were permanently bed bound prior to admission, moribund or unconscious, in receipt of terminal care or previous inclusion in the trial. In addition to usual fall prevention measures, for the intervention group a battery-operated bed and bedside chair pressure sensor was fitted that caused an alert on a handheld battery-operated radio-pager carried by nursing staff when the subject left the bed or bedside chair. The control group had usual care only. The primary outcome measure was the number of in-patient bedside falls ascertained from incident reporting forms per 1,000 bed days from time of randomisation to date of discharge, death, or study withdrawal, whichever occurred soonest. A concurrent qualitative study recorded the process of implementation. **Analysis:** The falls rate was calculated as the total number of falls divided by the total number of days post randomisation to give the number of falls per 1000 bed days. **Results:** 1,839 patients were randomised (921 to the control and 918 to the intervention arm). The mean age was 84.6 years (range 61 to 103), with a slight predominance of females (55% of total). Treatment arms appeared comparable in terms of baseline characteristics. There were no significant differences, adjusted or unadjusted between groups: the rate of falls in the control group was 9.84 per 1,000 bed days compared to 8.71 per 1,000 bed days in the intervention group. **Conclusion:** The addition of pressure sensors to usual fall prevention did not reduce the number of bedside falls.
IMPACT OF A THEORY-BASED OSTEOPOROSIS EDUCATION INTERVENTION ON PHYSICAL ACTIVITY IN OLDER ADULTS: A RANDOMIZED CONTROLLED TRIAL

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1University of Regina, Canada; 2Saskatchewan Ministry of Health, Canada; 3Regina Qu’Appelle Health Region, Canada

Objective: Whether dual energy X-ray absorptiometry (DXA) screening alone or combined with a theory-based education intervention, results in an increase in habitual physical activity and the decision to start or increase weight-bearing activity to prevent or manage osteoporosis.

Materials and Methods: Men and women 50 years of age and older (age range 50-80 years), were referred by their healthcare provider to undergo DXA screening for the first time at the local hospital. Participants (n = 182) were randomly assigned to an intervention group (n = 91) or control group (n = 91). Both groups underwent DXA screening and completed Voorrip’s physical activity questionnaire to assess habitual activity. The intervention group also received theory-based osteoporosis education. Six months after baseline, participants completed Voorrip’s questionnaire again and a follow-up questionnaire evaluating change in weight-bearing activity. Group differences and differences based on DXA results (osteoporosis, osteopenia, normal) were compared using chi-square, paired/independent t-tests, and contingency tables/ANOVA. Results: At follow-up, 25.8% of participants reported starting or increasing weight-bearing activity, but there was no significant difference between groups. Habitual physical activity decreased from baseline to follow-up in both groups. At follow-up, the intervention group had slightly increased activity scores (M = 11.93, SE = .68) compared to control group (M = 10.43, SE = .59); however this difference was not significant (t(171) = -1.72, p > .05). Osteoporosis diagnosis was associated with significant increase in weight-bearing activity (p = .05), but not habitual activity. Conclusions: This study provided evidence that a theory-based education intervention was unsuccessful in increasing weight-bearing or habitual physical activity. More research is needed in using a theory-based approach for improving physical activity to promote bone health in this population.

FALL PREDICTION IN ELDERLY POPULATION THROUGH ISOKINETIC ASSESSMENT OF THE LOWER EXTREMITIES AND STATIC AND DYNAMIC BALANCE FIELD TESTS

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Objective – To investigate for predictive factors for falls in the elderly population after lower extremity strength assessment in an isokinetic dynamometer and after performing in two static and dynamic balance field test and to construct a discrimination model for the classification of the elderly in a fallers and non-fallers group. Methods - 59 community dwelling elderly men and women aged 60 years and older with or without a history of falls all in good health were selected. We used six concentric and two eccentric speeds isokinetically (60°, 90°, 120°, 180°, 240°, 300°/sec and 60°, 120°/sec respectively) and four different angular positions isometrically (75°, 60°, 45°, 30° of knee flexion, 0° = anatomical zero) in the knee joint for both legs in flexion and extension. We also used two field tests of static and dynamic balance, the Timed Up & Go (TUG) test and the Functional Reach (FR) test. T-test was used in order to identify differences between fallers and non-fallers. Stepwise discriminant analysis performed in order to reveal the factors for classification of the elderly in fallers/
non-fallers group. **Results** – The results revealed that from the total 62 variances entered in the discriminant analysis, three predictive variables occurred: the mean total work ratio in 60°/sec., the TUG, and the mean eccentric peak torque in 120°/sec., classifying correctly the 94.6% of the elderly in the fallers-non fallers group. The predictive equation that derived was $z = 19.699 \text{ (mean total work ratio in 60°/sec.)} + 0.255 \text{ (TUG)} + 0.323 \text{ (mean eccentric peak torque in 120°/sec.)} – 99.091$. **Conclusions** - Isokinetic and isometric assessment of the lower extremities strength in the elderly population in combination with simple field tests of static and dynamic balance (TUG and FR tests) can discriminate fallers and non fallers. As a result we can therefore classify older people in prevention programs according to their probability for falls. Key Words: fall prediction, elderly, isokinetic assessment, static balance, lower extremities

**POSTURAL CONTROL AND MUSCLE ACTIVITY DURING SQUAT-TO-STAND IN OLDER ADULTS**

*Kuo, Fang-Chuan; Kao, Wen-Pin*

*Hungkuang University, Taiwan*

Squat-to-stand after ground activity is one important body weight transfer movement of daily activities. The purpose of this study was to compare the postural stability, kinematic and muscle activity during squat-to-stand between older and young adults. Twenty-four old adults (OA) and 24 young adults (YA) squatted on a platform to perform the rising up and the stability index during movement was measured. Surface EMG data were recorded on selected trunk and the lower extremity muscles. An electrogoniometer was fixed over the knee joint, and an inclinometer was fastened on the head to record kinematic data. The task was split into six movement phases based on the angular displacement and velocities of the knee joint. The OA had larger stability index in anterior-posterior direction than the YA. The maximal angle displacements and angular velocity of the knee joint were significantly ($p < 0.05$) lower in OA than YA. In addition, old adults use more head flexion in first half movement cycle but less lateral flexion in later half cycle than young ones. To cope with the motor pattern, the old adults need to increase activation of adductor magnus, gluteus medius, biceps femoris, rectus femoris, and gastrocnemius to stand up. The erector spinae was active earlier in the OA than the YA, while the gluteus medius and gastrocnemius muscles were active later. Older subjects and young subjects had different kinematic patterns of knee and head. Older subjects rise up with more posture sway and effort that implies loss of balance during this task easily.
Thursday 16th August 2012
Day Theme: Neurological and Musculoskeletal Conditions

Plenary Keynotes

PREVENTION AND MANAGEMENT OF NEUROLOGICAL CONDITIONS IN OLD AGE THROUGH PHYSICAL ACTIVITY AND EXERCISE
Studenski, Stephanie
Department of Medicine, University of Pittsburgh, United States.

Neurological impairments are a major contributor to problems of gait and balance in older people. Whether due to well-characterized conditions such as stroke or Parkinson’s disease, or to more recently recognized conditions such as leukoencephalopathy or age related dopamine deficiency, there are numerous emerging opportunities to promote improved function through physical activity. The key to successful interventions may be to go beyond traditional exercise that focuses on endurance and strength, to exercise that incorporates principles of motor learning.

NEW TECHNOLOGIES TO ENGAGE OLDER ADULTS IN PHYSICAL ACTIVITY
Smith, Stuart
Neuroscience Research Australia, Australia.

Over the past few decades, there has been a wealth of published scientific evidence for the physical, cognitive, and social health-related benefits of exercise and increasing physical activity (PA), especially in older adults. Strength, mobility, aerobic capacity, energy, anxiety, depression, and reduction in fall risk in older populations have been shown to improve following increased PA interventions. While numerous studies have demonstrated the health-related benefits of PA, adherence to PA programs is often disappointing. Barriers to adherence may include lack of interest in the program, low outcomes expectation, the weather, or even a fear of falling during exercise. In our group at Neuroscience Research Australia, we are examining how videogame technology can be used to increase compliance with exercise. In particular we are assessing the effects of exercise-based videogames to reduce the risk of falling, a major barrier to continued independence.
NEW INSIGHTS INTO PREVENTION OF DISABILITY BY PHYSICAL ACTIVITY AND EXERCISE

Tak, Erwin1; Dronkers, Jaap2; Koeneman, Margot3; Hopman-Rock, Marijke4

1TNO, Netherlands; 2General Hospital Gelderse Vallei, Netherlands; 3TNO/VU University Medical Center, Netherlands; 4TNO/VUmc, Netherlands.

Aging is often accompanied by a decline in functional performance and disability as described in the disablement process model (Nagi, 1976; Verbrugge & Jette, 1994). Physical activity and exercise have been identified to influence the pathway from aging and disease to disability. Recent work in this area will be presented by researchers from the Body@Work Research center TNO VU university medical center (Leiden/Amsterdam, The Netherlands). This symposia will cover a short introduction, a review and meta-analysis of the relationship between physical activity and ADL disability in older adults, studies on preoperative physical activity and physical fitness predicting postoperative recovery, and whether major life events predict physical activity among older adults.

Review and meta-analysis of the relationship between physical activity and ADL disability in older adults

Review and meta-analysis of the relationship between physical activity and ADL disability in older adults

Tak, Erwin1,2; Kuiper, Rebecca1; Chorus, Astrid1; Hopman-Rock, Marijke1,2

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Introduction: physical activity (PA) has been identified as an important behavior to prevent or slow down the disablement process caused by aging an chronic diseases. It is unclear whether PA can directly prevent or reduce ADL disability. We performed a systematically review and meta-analysis on the association between physical activity and the incidence and progression of disability in basic activities of daily living (BADL) in community dwelling older adults. Methods: electronic literature search in PubMed (until January 2012) and by cross-referencing; prospective longitudinal studies in community dwelling older adults (50+) with PA and BADL included at baseline and follow-up using multivariate analysis and reporting a point estimate for the association were included. Two reviewers independently scored all included articles on quality measure, study description, PA level (low, medium, high) and disability definition (incidence or progression), point estimates (Odds or risk ratio).

Results: compared to low PA, a medium/high PA level reduces the risk on incident BADL with 0.51 (95%CI: 0.38, 0.68; p < .001) based on 9 included longitudinal studies covering over 17.000 participants followed 3 to 10 years. This result was not different for older (75+) or younger age groups, length of follow-up, study quality or for differences in demographics, health status, functional limitations, or lifestyle. The risk of progression of BADL for older adults with medium/high PA compared to low PA is 0.55 (95%CI: 0.42, 0.71; p < .001), based on 4 studies covering around 8.500 participants. Discussion: PA prevents and slows down the disablement process in aging or diseased populations, positioning PA promotion as a very effective strategy in preventing and reducing disability, and therefore enhancing future independence and reducing health care costs in aging societies.
The better the way in, the better the way out: Preoperative functional status as predictor and improvement factor of the postoperative course

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Objective: To determine whether preoperative physical activity (PA) and physical fitness (PF) can predict postoperative recovery in older patients. Background: A low PA and PF adversely affect how a patient responds, physically and mentally, to the challenge of hospitalization and surgery, which could result in increased mortality, postoperative complications, and loss of mobility. Methods: Prospective cohort study of 175 patients (mean age 72±7 years) scheduled for major oncological abdominal surgery. Conventional risk factors (age, metastatic cancer, diabetes, heart diseases, COPD, smoking, productive cough), PA factors (LASA Physical Activity Questionnaire [LAPAQ]), and PF factors (Timed Up and Go [TUG], Chair Rise Time [CRT], Maximal Inspiratory Pressure [MIP], Respiratory Cumulative Energy [RCE], Handgrip Strength [HGS]) were assessed preoperatively and in-hospital mortality, discharge destination, and length of stay (LOS) postoperatively. Results: Thirteen patients died in hospital, and in-hospital mortality was significantly correlated with age, LAPAQ, TUG, RCE, and HGS (p < 0.05); multivariate analysis identified LAPAQ (OR 5.5, 95%CI 1.4 – 21.9) and RCE (OR 5.2, 95%CI 1.4 - 19.1) as independent predictors. Sixteen patients were discharged to a nursing home, and this was correlated with age and all but one PA and PF factor (p < 0.05); multivariate analysis identified LAPAQ (OR 6.7, 95%CI 1.4 – 3.0) as independent predictor. LOS (median 12; IQR 12 days) was significantly correlated with diabetes, COPD, CRT, and MIP (p < 0.05); multivariate analysis identified COPD (B 0.5, 95%CI 0.2 – 0.9) and LAPAQ (B 0.3, 95%CI 0.1 – 0.5) as independent predictors. Conclusion: Preoperative indices of PA and PF were prognostic of postoperative recovery, additional to conventional predictors.

Do major life events influence physical activity among older adults: The Longitudinal Aging Study Amsterdam

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Background: Major life events are associated with a change in daily routine and could thus also affect habitual levels of physical activity. Major life events remain largely unexplored as determinants of older adults’ participation in physical activity and sports. This study focused on two major life events, widowhood and retirement, and asked whether these major life events were associated with leisure time moderate to vigorous physical activity (MVPA) and
sports participation. **Methods:** Data from the first (1992-93) and second (1995-96) wave of the Longitudinal Aging Study Amsterdam (LASA), a prospective cohort study with a representative sample of the Dutch population aged 55 and older, were used. Change in marital status and employment status between baseline and follow-up was assessed by self-report. Time spent in MVPA (min/d) and sports participation (yes/no) was calculated based on the LASA Physical Activity Questionnaire. The association of retirement and widowhood with MVPA and sports participation was assessed in separate multivariate linear and logistic regression analyses, respectively. **Results:** Widowhood \( N = 136 \) versus 1324 stable married- was not associated with MVPA \( (B = 3.5 [95\% CI, -57.9 ; 64.9]) \) or sports participation \( (OR = 0.8 [95\% CI: 0.5;1.3]) \). Retired participants \( (N = 65) \) significantly increased their time spent in MVPA \( (B = 32.5 [95\% CI: 17.8;47.1]) \) compared to participants who continued to be employed \( (N = 121) \), but not their sports participation. Age was a significant effect modifier \( (B = 7.5 [90\% CI: -1.1;13.8]) \), indicating a greater increase in MVPA in older retirees. **Discussion:** Our results suggest that the association between major life events and MVPA and sports participation varies by type of major life event and age group. MVPA increased after retirement, but no influence of widowhood was seen.

**PHYSICAL ACTIVITY AFTER STROKE: CURRENT DEVELOPMENTS**

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**Introduction:** Following a stroke, physical fitness is often considerably reduced, affecting muscle strength, muscle power, and aerobic capacity. We will start this symposium by highlighting the extent to which physical fitness is impaired after stroke \( (1) \), and explain the impact this may have on activities of daily living, independence, and community reintegration. Next, we will discuss the evidence base for exercise and fitness training after stroke, including its safety, feasibility, effectiveness \( (2) \), and psychosocial impact \( (3) \). This body of evidence has informed current clinical guidelines and government policies, which recommend physical activity as part of a more active lifestyle after stroke wherever possible \( (4) \). However, in order to successfully engage stroke survivors in physical activity, we need to understand the barriers and motivators they may perceive, and the psychosocial factors that influence their engagement with physical activity \( (5) \). We will present new findings from a programme of work in this relatively unexplored area, and discuss its possible implications. With more and more stroke survivors being referred for exercise and fitness training, it is important to establish the number and quality of available services. We will discuss the main findings from a recent survey of community-based exercise after stroke services in Scotland, which demonstrated a lack of service provision, as well as considerable variation in quality and governance \( (6) \). The findings from the survey informed the development of best practice guidance for exercise after stroke services \( (7) \), of which a brief overview will be presented. Key issues in relation to community-based exercise after stroke services will be discussed. The session will conclude with directions for further research, practice and service design. **References:** 1. Smith A, Saunders D, Mead G (in press). Cardiorespiratory fitness after stroke: a systematic review of the literature. Int J Stroke; 2. Brazzelli M, Saunders DH, Greig CA, Mead GE (2011). Physical fitness training for stroke patients. Cochrane Database of Systematic Reviews 2011, Issue 11. Art. No.: CD003316. DOI: 10.1002/14651858.CD003316.pub4; 3. Sharma H, Bulley C, van Wijck F (in press). Experiences of an exercise referral scheme from the perspective of people with chronic stroke: a qualitative study. Physiotherapy. doi.org/10.1016/j.physio.2011.05.004; 4. Scottish Intercollegiate Guidelines Network (2010).
INCREASING WALKING PARTICIPATION THROUGH PRIMARY CARE: WEST END WALKERS

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1University of Strathclyde, UK; 2University of Glasgow, UK; 3Glasgow Caledonian University, UK.

Primary care is a good setting for physical activity promotion since the majority of older adults visit their GP at least once each year. In the West End Walkers 65+ study [WEW 65+], we aimed to assess the feasibility of a pedometer-based walking programme in combination with physical activity consultations with patients aged over 65 years from primary care. The study was designed as a two-arm (intervention/control) 12-week randomised controlled trial with a 12-week follow up for the intervention group and with additional qualitative methods and was set in one general practice in Glasgow, UK. The intervention group received two 30-min physical activity consultations from a trained practice nurse, a pedometer, and a walking programme. The control group continued as normal for 12 weeks and then received the intervention. Both groups were followed up at 12 and 24 weeks. In this symposium, we will summarise the main findings in relations to physical activity and sedentary time, provide insight to the participants’ experiences, and discuss the merits of providing a walking group and offer novel analysis of patterns of sedentary time recorded from the participants. Each speaker will talk for 10 min and then 5 min of question or discussion will follow. There will be time for an overall discussion at the end.

Study rationale and design

Mutrie, Nanette

University of Strathclyde, UK.

In the West End Walkers 65+ study [WEW 65+], we aimed to assess the feasibility of a pedometer-based walking programme in combination with physical activity consultations with patients aged over 65 years from primary care. We had evidence from previous work that adults could increase their step count by around 3,000 steps/day when guided by a pedometer based walking programme and a physical activity consultation [Baker et al., 2008]. However, such an approach had not been tried for older adults. Recruiting older adults from primary care was seen as a good approach since the majority of older adults visit their GP at least once per year. The feasibility element of this trial was needed to determine if older adults would respond to an invitation from their GP to take part in a walking study...
and if they could be retained over 6 months. The pilot element was needed to determine if the instrumentation was appropriate and to guide sample sizes needed for a fully defined trial. The trial is registered [Trial registration number ISRCTN70658148] and the protocol has been published (McMillan et al., 2010).

**Intervention effects for physical activity and for sedentary time**

Fitzsimons, Claire

*University of Strathclyde, UK.*

The primary outcome was the average daily step count over one week, recorded with a sealed pedometer (NL-1000). The *activPAL* monitor (PAL Technologies Ltd) was also used to record step counts and quantify activity patterns. Psychosocial variables were assessed by self-report questionnaires: the Short-Form Health Survey version 2 (SF-36v2) to assess quality of life; the Positive and Negative Affect Schedule (PANAS) to assess mood; the Perceived Motor-Efficacy Scale for Older Adults (PMES-OA) to assess functional ability; and the UCLA Loneliness Scale (version 3) as a measure of emotional and social loneliness. Step counts, activity patterns and psychosocial variables were assessed at three time points; baseline, 12 weeks and 24 weeks. There was no evidence of changes in pedometer step counts in either group during the first 12 weeks of the study, and no difference between groups over this period. Between weeks 12 and 24, the control group increased their average daily walking by 1672 pedometer steps. There was strong evidence of an intervention effect with *activPAL* step counts, based on the between-group comparison of changes over the first 12 weeks of the study (2,119 steps/day, \( P = 0.001 \)). During the walking intervention both study groups showed similar step count increases (1,907 for intervention and 1,908 for control when they received the intervention; standardised effect = 0.78). The increase in steps observed from baseline appears to have been maintained in the intervention group (mean step count week 12: 9,351; week 24: 9,161; \( P = 0.65 \)). Both groups showed increases in walking time and decreases in sedentary time during the periods when they received the walking intervention. Whilst a pattern of improvement was seen across all subscales of the SF-36, the physical health dimension score was most sensitive to change during the intervention. Neither PANAS (both positive and negative) scores, the UCLA Loneliness Scale nor PMES-OA scores showed any evidence of within- or between-group effects during the study.

**Exploring participant views and experiences**

Shaw, Rebecca

*University of Glasgow, UK.*

The aim of the qualitative study was to explore participants’ views and experiences of the intervention. Two focus groups were conducted; one with each study group (intervention and control) upon completion of the 12-week programme. The focus group schedule explored perceived benefits of increased walking, views on the pedometer and *activePAL™*, the physical activity consultation and on-going support, problems encountered, future recommendations and reflections on participation. A thematic analysis of the data highlights a number of barriers and facilitators to increased walking. This data also provides insights into the underlying processes that determine the feasibility of implementing such an intervention in this setting and with this population group, for instance, what worked, what did not work, the perceived impact and why and how the intervention could be improved for future delivery.
Is a walking group a good idea?
McMillan, Freya

*University of Strathclyde, UK.*

We set up a twice-weekly optional walking group as part of the WEW65+ intervention. The group was poorly attended with only 9 participants taking part in at least one walk and only 5 regular attendees (who attended at least 6 walks). As the WEW65+ intervention successfully increased activPAL steps despite the poor attendance at the group, we conclude that the study walking group was not an essential element for our participants. However, during focus groups discussions several participants spoke positively about walking groups mentioning benefits such as the added safety of walking as a group. Others mentioned not being able to attend our walk as they were unavailable during the running times or because they preferred to walk alone. We suggest working closely with existing local walking groups to provide the option to attend a walking group for those that find group support important.

Patterns of sedentary time
Grant, Margaret

*Glasgow Caledonian University, UK.*

The primary results from this study showed that a pedometer-based walking programme, in combination with physical activity consultations, was effective in increasing the number of steps walked in a sample of older adults aged ≥65 years. To examine the effect of the walking intervention on other parameters of physical activity behaviour, the postural profiles of the participants were investigated. Using a single body-worn monitor, the postural behaviour of the participants was recorded continuously over the period of a week at baseline, 12 and 24 weeks. Using novel analysis techniques, this presentation will describe the changes in postural activity patterns over the course of the study.

EFFECTS OF AGING AND EXERCISE ON PERSONS WITH SPINAL CORD INJURY
Dolbow, David; Gater, David

*Hunter Holmes McGuire VA. Medical Center, United States.*

Spinal Cord Injury (SCI) has evolved from a condition of almost certain rapid death three quarters of a century ago to a chronic disability that is treated throughout life. Due to advances in medical and rehabilitational care, the life expectancy of those with SCI has dramatically increased and is nearing that of the able-bodied population. With increased longevity come many of the medical, physical, and psychological conditions that accompany aging and inactivity. However, these conditions appear more rapidly and to a greater extent in those with SCI. Whereas the causes of death in persons with SCI have changed along with medical advances, health conditions linked to aging and inactivity have increased. Cardiovascular disease and respiratory problems have emerged as the primary causes of death, while obesity, metabolic syndrome, diabetes and osteoporosis have become epidemic in the SCI population. Likewise, the psychological and quality of life issues that accompany aging and disability are found in those with SCI more frequently and much earlier in life causing depression to occur at a rate 2 to 3 times greater than with the able-bodied population. **Keywords:** Spinal Cord Injury; Aging; Physical Activity; Quality of Life; Depression.
Aging and metabolism after spinal cord injury

Gater, David R.

Hunter Holmes McGuire V.A. Medical Center, United States.

The spinal cord provides the conduit, figuratively and literally, for communication between the brain and the peripheral nervous system. Disruption of the cord profoundly impacts somatic as well as autonomic control, as well as reflex responses in both realms. Loss of motor control and sensory perception is dependent upon the level and completeness of a spinal cord injury (SCI), and diminishes an individual’s independent mobility, as well as activities of daily living and ability to participate in vocational and community activities. Sympathetic nervous system disruption associated with higher levels of SCI further diminishes a person’s responsiveness to internal and external cues required to maintain homeostasis. Cumulatively, these perturbations alter practically every organ system in a way that accelerates the usual aging process and places the individual with SCI at significantly greater risk for the complications of aging than his/her non-injured peers. This presentation will review SCI impact on each organ system and provide a foundation for understanding the potential benefits and limitations of exercise applications in this vulnerable population.

Keywords: Spinal Cord Injury; Metabolism; Autonomic Control; Aging.

Functional electrical stimulation cycling as a counter to accelerated aging after SCI

Dolbow, David R

Hunter Holmes McGuire V.A. Medical Center, United States.

Individuals with SCI undergo what is referred to as “Accelerated Aging Phenomena” during which most organ systems of the body deteriorate at an accelerated rate. This is especially true concerning body composition with rapid loss of muscle mass and bone mass and an increase in fat mass. This process is due in large part to denervated muscles and decreased overall physical activity. Due to advances in technology home-based functional electrical stimulation cycling is emerging as a viable counter to the accelerated aging process. Two case reports of older males with chronic SCI provide encouragement to this end. A 64-year-old male of age performed FES-LEC three sessions per week for 9 weeks in his own home while monitored by the research staff via internet connection. The participant completed 25 of 27 recommended exercise sessions for a 93% compliance rate. Cycling distance increased from 3.98 to 9.00 km (126%). Total body LM increased from 48.94 to 53.02 kg (8.3%). The %BF decreased from 29.6 to 28.4(-1.2%). Total body weight, FM and BMD remained unchanged. Average static seat pressure decreased from 55.5 to 52.59 mm Hg (5%), whereas maximum seat pressure decreased from 120.76 to 91.5 mm Hg (24%). The psychological domain (perception of body image, appearance, and self-esteem) of the QOL questionnaire improved from 12.67 to 14. A 53 year old male, 33 years post motor complete C4 SCI participated in functional electrical stimulation lower extremities cycling (FES-LEC) in his home 3 sessions per week for 24 weeks. The participant cycled 59 out of a recommended 72 sessions, which is an exercise adherence rate of 82%. Body composition displayed increases in total body lean mass (LM) with an increase of 3.3% and an increase in leg LM of 7.1%. Energy expenditure increased by 1.26 kcal/min or greater than 200%. The physical and psychological domain scores of QOL increased by 25% and 4.5% respectively. These case studies provide encouragement concerning the feasibility and practicality of a home based FES-LEC program for those with SCI. Keywords: Muscle and Bone Mass; Technology; Functional Electrical Stimulation Cycling.
Pelvic floor exercise for urinary continence in elderly spinal cord injured client: A case from Bangladesh perspective

Karim, Mohammad M
CRP, Bangladesh.

Introduction: Urinary incontinence in the elderly is a significant health problem fraught with isolation, depression, increased risk of institutionalization and medical complications. It is also very common in spinal cord injured (SCI) clients and Pelvic floor exercise is prescribed in urinary incontinence. Effectiveness of pelvic floor exercise in aged SCI patient is measured in a single case from Bangladesh. Methods: Pelvic floor exercise is applied on a 62-year-old SCI patient incomplete C in ASIA impairment scale. Slow contraction of pelvic floor muscles was applied for 10 times with interval. Every contraction last for 10 seconds each. Same protocol is also applied in fast contraction of pelvic floor muscles. Each slow and fast contraction was repeated actively 5/6 times every day while patient was in relaxed supine position for 6 weeks. After 6 weeks, the patient is evaluated by subjective questionnaire. Results: The initial complaint of the client was dripping of urine during supine to side lying, sit to stand to sit, during pumping tube well, early removal of urine during sitting to Asian toilet, during coughing, sneezing, and laughing. He also felt incomplete evacuation of urine after urination. After 6 weeks, he completely managed dripping during supine to side lying. Very rarely, he leaks urine during pumping tube well, sneezing, coughing, and laughing but still to improve in Asian toilet sitting. Now he is feeling more complete evacuation of urine after urinates. Discussion: Pelvic floor exercise helps the client to control the incontinence effectively. Less strength of pelvic floor muscles were making the incontinence which has been improved after exercise. Still it needs to be continued to get further improvement. It seems to be a vital way of reducing incontinence among spinal cord injured clients. More research is recommended with larger numbers of people. Keywords: Pelvic Floor Exercise; Spinal Cord Injury; Urinary Incontinence; Bangladesh.

REHABILITATIVE WAYOUT IN RESPONSIVE HOME ENVIRONMENTS (REWIRE): ISSUES AND POSSIBLE SOLUTIONS OF MOVING STROKE REHABILITATION AT PATIENT’S HOME

Borghese NA1, de Bruin, Eling D2, Paraschiv-Ionescu A3, Bulgheroni MV4
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Introduction: Rehabilitation after stroke is based on guiding the patient through a set of adequate exercises that are usually carried out in a one-to-one session with the therapist with high costs for the Health Providers and high stress and discomfort for the patients. Aims: REWIRE develops, integrates, and field tests an innovative virtual reality based rehabilitation platform, which allows patients, discharged from the hospital, to continue intensive rehabilitation at home under remote monitoring by the hospital itself. Methods: The platform is constituted of three hierarchical components: a patient station (PS), installed at home, a hospital station (HS) and a networking station (NS) at the health provider site. The PS is based on off the shelf components: video-based tracking, pressure measurement, and virtual reality. The patient sees himself or an avatar on the display moving and interacting in real-time with a virtual game with his movements tracked in real-time. A variety of game
scenarios and a balanced scoring system with quantitative exercise evaluation, together with audio-visual feedback aim at maximizing motivation. Patients’ daily activity is monitored by Body Sensor Networks and his/her activity is profiled and used to tune the rehabilitation level, to assess potential risks and advice clinicians on the therapy. The HS has two main roles: defining and monitoring the rehabilitation carried on at home and to support a set-up for a community of patients to educate and motivate them. Data mining in the NS discovers common features and trends of rehabilitation treatment among hospitals and regions. 

Results: Preliminary results on the design and implementation of the PS and the HS will be reported and discussed along with the main issues and trade-offs that have to be considered for massive deployment. Discussion: These results show that assembling novel ICT technology a reliable platform can be assembled that makes rehabilitation at home possible. Keywords: Stroke; Rehabilitation; Home Treatment; Technology.

Rehabilitation at home: The Intelligent Game Engine for Rehabilitation (IGER system)

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1Applied Intelligent Systems Laboratory, University of Milano, Italy; 2Department Electrical and Computer Science Engineering, Politecnico of Milano, Italy.

Introduction: Videogames are becoming a valuable tool to guide patients through rehabilitation as they provide motivation as well as the possibility to monitor performance. Methods: The REWIRE platform is heavily based on games. These are implemented inside a Patient Station (PS) deployed at patient’s home. The PS provides three major functionalities: support of a patient’s virtual community, log of lifestyle data, and management of the communication with hospital. It also hosts the Intelligent Game Engine for Rehabilitation (IGER) containing a game engine, an input layer, and a game supervisor. The game engine provides the game scenarios to the patient on a home TV screen and monitors the interaction of the patient with them. Scenarios variety, balanced scoring system, quantitative exercise evaluation, audio-visual feedback aim all at maximum patient’s motivation. An input abstraction layer allows the integration of several input devices for the same game depending on patient’s disabilities and rehabilitation goals. Game play is controlled by the game supervisor that monitors the patient’s performance and adapts the play in real-time. The supervisor is based on implicit intelligence that allows keeping the game at an adequate challenge level. An explicit intelligence module is also implemented inside the supervisor to monitor critical situations; e.g. tilting the trunk when moving a foot forward or laterally, or moving the shoulder forward instead of extending the arm when reaching for an object. In these cases, a virtual therapist appears on the screen to warn the patient and to give advice on how to improve performance. Discussion: Preliminary games aimed at posture and balance will be presented. These have been designed according to Gentile’s taxonomy. Examples on the operation of implicit and explicit game intelligence will be shown to illustrate the potentiality of the IGER system. Keywords: Stroke; Rehabilitation; Home Treatment; Technology; Games.

Design of a theory based exergame program for chronic stroke survivors to enable continued rehabilitation at home

de Bruin, Eling D, Wüest, Seline

Institute of Human Movement Sciences and Sport, Department Health Sciences and Technology, ETH, Zurich, Switzerland
Introduction: A challenge for health-care is an increased need for rehabilitation programs to enhance recovery and improve functional status of stroke survivors. Termination of motor rehabilitation is often recommended in those cases where stroke patients become more chronic and/or when they fail to respond positively to continued rehabilitation. It can be speculated, however, that when principles of exercise training are adhered to part of the impairments seen in stroke survivors will continue to recover. This indicates the need for continued training in the chronic stroke population with programs that are adapted to the needs of patients. Aims: To develop a theory-driven home based rehabilitation program where patients perform remotely supervised neuro-rehabilitative training in a virtual environment. Define appropriate physical exercises and training recommendations to optimally challenge patients’ performance capabilities. Methods: Gentile’s taxonomy [1] was adopted to design appropriate training exercises targeted to enhance and restore stroke patients’ motor function. Results: Exercises were developed in which two general dimensions of an action are distinguished: (1) the environmental context and (2) the function of the action. These two dimensions were subdivided into four environmental context characteristics and four action function characteristics. The interaction of these characteristics resulted in a training program of sixteen different skill categories. The skill categories are used to design the exergames. Discussion: Using the taxonomy, long-term continuation and monitoring of stroke patients’ rehabilitation process and associated functional progress might be possible in a rather simple way. The classification system provides the opportunity to gain exercise-based data over an individuals’ continuous rehabilitation over longer time periods. References: [1] Magill RA. Motor learning and control: Concepts and applications. McGraw-Hill Boston, MA; 2007. Keywords: Training Exercises; Stroke; Home Rehabilitation; Technology.

Tuning up home rehabilitation therapy using lifestyle evaluation.
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Introduction: The REWIRE project aims at providing a virtual-reality (VR)-based home rehabilitation tool for patients discharged from hospital. Although the REWIRE rehabilitation platform allows patients to remain connected to their initial centre of care for remote therapy planning and performance assessment, VR-based home therapy encompasses several challenges due to the limited supervision during training. Aims: The purpose of the lifestyle evaluation module, in the framework of REWIRE, is to deliver a feedback to the therapy planning engine which enables automatic, fine-grain adaptation of the rehabilitation exercises based upon patient’s short- and long-term physiological and physical functioning metrics. Methods: The lifestyle evaluation will be performed through a network of unobtrusive body-worn wireless sensors capable of both activity and physiological (heart-rate) monitoring. A multi-time scale assessment is envisioned to quantify patient’s daily-life behaviour and will be provided as feedback information to the REWIRE therapy planning engine. On one hand, short-term (e.g. daylong) assessment, based on activity type and intensity as well as patient’s current physiological state will reflect the current patient’s fitness prior starting a rehabilitation session. On the other hand, advanced data mining techniques will provide a longer-term overview of the therapy progress through a longitudinal analysis of patient’s lifestyle. Discussion: Unobtrusive and multi-scale lifestyle evaluation does not depend on the type of rehabilitation/clinical condition and can therefore become an effective assessment tool not only in home rehabilitation but also in “conventional” rehabilitation and/or different
Designing a comprehensive system for home rehabilitation: Cooperative involvement of technicians, clinicians, therapists and end users

Bulgheroni MV, d’Amico EM, Laudanna E

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Introduction: Home rehabilitation is a key issue in the reorganization of health and social systems. Demographical changes and new lifestyles ask for a new approach to long-term rehabilitation. Aims: The purpose of this study is to design an effective home rehabilitation system that will deliver suitable rehabilitation programs within the overall framework of the health and social system. The final aim is to move the point of care to the patient’s home extending the hospital system to include it. Methods: The design of an effective home rehabilitation system needs a detailed investigation of different requirements: end users look for rehabilitating at home without losing connection with the clinical setting; therapists search for new working scenarios over the one to one session limit; clinicians ask for successful ways to evaluate therapy outcomes and health administrators aim at improving costs/benefits ratio for a more sustainable health care. To cope with this multifaceted environment, two complementary approaches have been combined. On one side a top-down methodology, based on the decomposition of the system complexity in its basic functions, has been performed by means of Unified Modeling Language and conceptual maps; on the other a bottom-up process has been applied by directly involving users through devoted surveys. Results: The resulting system builds around a kernel consisting in the rehabilitation design and performing. End users will interact with the system to exercise, connect to the hospital environment, and participate to a community of users. Therapists will design and monitor rehabilitation according to the single user needs. Clinicians will keep care of the individual assessment. Health administrator will manage the overall picture. Discussion: A prototype of the complete system is under development. A strict connection with users will be maintained all along the development phase by means of devoted small pilots in real life conditions.

Keywords: Stroke; Rehabilitation; Home Treatment; Technology.

PHYSIOLOGICAL SOCIETY SPECIAL SYMPOSIA: THE INFLUENCE OF PHYSICAL ACTIVITY ON SARCOPENIA—RESEARCH UPDATE

Greig, Carolyn1; Rennie, Michael J2; Onambele-Pearson, Gladys3; Beyer, Nina4; Visser, Marjolein5

1 University of Edinburgh, UK; 2University of Nottingham, UK; 3Manchester Metropolitan University, UK; 4Musculoskeletal Rehabilitation Research Unit, Bispebjerg Hospital, Denmark; 5VU University Amsterdam, The Netherlands.

Despite an increasing research effort utilising physical activity strategies to target sarcopenia, there remain several important gaps in our knowledge and understanding that hamper our efforts to ameliorate this condition. For example, we still know relatively little about the mechanisms influencing responsiveness to acute and chronic activity in old people, the constituents of the optimal training regime, the efficacy of multimodal interventions and the translational value of current basic and applied science physical activity approaches. There exist also important practical challenges inherent to the design and delivery of interventions, particularly for frail older people. This Symposium aims to review current physical activity/
sarcopenia research, highlight the knowledge gaps, discuss the practical challenges, and propose future research directions.

**How do exercise and nutrition affect muscle mass with age and can we do anything about it?**

Rennie, Michael J  
*University of Nottingham, UK.*

It is well established that human skeletal muscle mass declines with age at about 0.5-2% per year after the age of 50. The mechanisms of this decline are not well understood but obviously involve a failure of the balance between muscle protein synthesis and muscle protein breakdown. Some years ago it seemed to most workers in the field that there must be a deficit in the rates of basal muscle protein synthesis (MPS) or an elevation of muscle protein breakdown (MPB) but this was shown not to be the case and it now appears that the major driver for the loss of muscle protein is a failure of MPS in response to feeding and exercise. Hormonal effects on human MPS are slight, there being no influence of insulin or growth hormone on MPS, and no age related effects. However, MPB is inhibited by insulin and the effect is less in older subjects. Nevertheless, the major defect seems to be what we have termed “anabolic resistance” to the normal stimulatory effects of amino acids, particularly the essential amino acids leucine. Together with the effect of a lessening of the inhibitory effect of insulin on MPB, there is a deficit of the capture of amino acids in the diurnal period. There appear to be sex related effects with anabolic resistance being greater in postmenopausal women. Resistance exercise stimulates MPS in a dose related manner, with the slope and extent of the curve being less in older subjects. Exercise training increases the microvascular blood flow to skeletal muscle in a way that increases the delivery of nutrients and hormones in a manner likely to be beneficial. Increased intake of dietary protein per se is unlikely to stimulate muscle maintenance but addition of moderate amounts of fish oil appears to rejuvenate anabolic effects of amino acids in older subjects.

**The efficacy of multimodal interventions to combat sarcopenia?**

Onambele-Pearson, Gladys  
*Manchester Metropolitan University, UK.*

Sarcopenia is one of the many chronic conditions the incidence of which increases even in healthy ageing. Our knowledge of sarcopenia in older persons suggests that changes are concurrent with increased production of catabolic cytokines, inadequate intake of dietary energy, declines in alpha-motor neurons, growth hormone production, sex steroid levels, and physical activity, culminating in increased fatty tissue content, decreased skeletal muscle (and satellite cells) content as well as decreased bone mineral density. Overall, the ensuing result is a decreased physical ability which has been proposed to be reversible with exercise training. The majority of the exercise training interventions have been with resistance modalities. Indeed many resistance training (RT) studies, utilising either one or a combination of concentric, eccentric, or inertial loading, demonstrate substantial (>50%) improvements in the maximum force capacity of older persons after 6 or more weeks of training. Similarly, muscle power, arguably the most important parameter of relevance to physical performance since it accounts for ~40% of the variance in functional status, is also shown to improve with RT. Moreover, the reports on the effectiveness of RT demonstrate that the amount
of skeletal muscle tissue, either directly seen through CT/MRI/DEXA/US scanning and anthropometry or indirectly as demonstrated through endocrinologic alterations such as IGF-1 and myosin levels, can also be improved in a similar time frame. RT and alternative interventions, including postural balance training, flexibility training, 'unstructured' group activities, and nutritional supplementation (e.g. protein, statins, dietary cholesterol, omega3, anti-oxidants, vitamin D), have recently been trialled in various combinations with variable degrees of success. The effectiveness of any intervention is limited by the fact that whilst mechanical loading (and/or adequate nutrition) can increase the cross-sectional area of the fibers that are present in the older persons muscle, these interventions tend not to restore the number of fibers that is characteristic of young muscle. A major challenge in preventing an epidemic of sarcopenia-induced frailty in the future is improving the understanding we have of the degree of responsiveness and/or the exact life style choices required to obtain/retain physical independence. Here, we explore the current status of the evidence for the efficacy of multimodal programs to reverse ageing-associated sarcopenia.

How can we optimise physical training regimes for older people?

Beyer, Nina

Musculoskeletal Rehabilitation Research Unit, Bispebjerg Hospital, Copenhagen, Denmark.

Sarcopenia, i.e. low muscle mass and strength, is related to increased risk of falls, frailty, disability, and loss of functional independence with age. Lower body strength is needed for a variety of daily activities such as getting out of chair or bed, walking, and climbing stairs. Deficits in muscle strength appear to be most dominant in tasks where a certain amount of strength is necessary to succeed. The question is what type or types of training to choose if the goal is to improve muscle strength and function and increase reserve capacity. Few studies exist on the effect of endurance exercise in old people. High-intensity interval walking has been shown to improve fitness and muscle function but at present the potential benefits of this type of training are unclear. In frail older people, reduced muscle mass and strength may result in an inadequate cardiovascular load to stimulate increases in cardiac output and thus prevent an effect on fitness. In contrast, strength training appears to be feasible in healthy older people and people with co-morbidity from the young old to the oldest old. Particularly, higher intensity progressive resistance training is effective for improving muscle mass and strength among older adults indicating a dose-response relationship. In addition, high-intensity strength training and power training (where the concentric phase is performed with maximal speed) is more effective in improving stair climbing compared with low-intensity. In contrast, there appears to be no significant differences between the effect of resistance exercise and functional training for improving less demanding activities such as normal walking speed and Time-Up-and-Go performance. Although resistance exercise may improve balance training, regimes for older persons with balance problems should include balance training especially if the goal is to prevent falls. During the last decade, whole body vibration training has been promoted as a potentially safe, low impact alternative to improve muscle function in mobility-limited individuals. However, the published literature to date provides only weak support for the efficacy of whole body vibration training for muscle function. So, although a vast number of randomised studies exist on exercise in older people there is still need for high quality large scale studies to determine the optimal exercise regimes for different groups of older people.
The influence of physical activity on skeletal muscle frailty
Visser, Marjolein

*Department of Health Sciences, VU University Amsterdam, The Netherlands.*

In 1994 a landmark study was published showing that exercise training increases muscle mass and muscle strength among frail older nursing home patients. These type of studies and the launching of the concept sarcopenia (defined as the age-related decline in muscle mass) have led to an sharp increase in the number of studies investigating the association between physical activity and muscle in older persons. This presentation will review some results of specific intervention studies aiming to increase muscle mass and/or strength by physical activity. The impact of the intervention on fat infiltration into the muscle will be discussed, as well as its impact on the prevention of muscle loss during energy restriction in older obese persons. Apart from intervention studies, data from observational studies among large cohorts of older persons will be presented to discuss the association between physical activity and muscle. Specific attention will be paid to prospective studies investigating age-related change in muscle over time, thereby showing the potential benefit of an active lifestyle for successful aging.

**Oral Presentations**

**EXERCISE AND PHYSICAL ACTIVITY IN FRAILER OLDER PEOPLE**

Changes in muscle thickness over 12 months in older frail women nursing home residents

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**Introduction:** The reduction of skeletal muscle mass that occurs with aging (sarcopenia) leads to disability in the elderly population. **Purpose:** To investigate the prevalence of sarcopenia among older frail nursing home residents and to examine the rate of change in muscle thickness (MT) over 12 months. **Methods:** B-scan ultrasound equipment with a 5MHz transducer was used to measure MT on 16 older frail women nursing home residents (age = 85.0 yr, height = 143.9 cm, mass 45.4kg) at six sites (triceps, biceps, subscapular, abdomen, quadriceps, and hamstrings). Sarcopenia was defined as 2 SD below the MT norm for Japanese young men and women (Abe and Fukunaga, 1995). **Results:** MT of quadriceps for all subjects was 2 SD below the normal MT of young adults at baseline. The prevalence of sarcopenia in triceps, biceps, abdomen, subscapular, and hamstrings was 25-93% at baseline. After 6 months of living in a nursing home, the prevalence of sarcopenia for the upper body and trunk increased (p < 0.05). Biceps and triceps MT decreased by 37% and 32%, respectively, after 12 months. Abdomen and subscapular MT decreased by 29% and 52%, respectively. Quadriceps and hamstrings MT decreased by 18% and 24%, respectively. **Conclusion:** Residing in a nursing home and maintaining an inactive lifestyle is associated with a decrease of upper limb and trunk MT that parallels the loss of muscle mass in the lower limbs. Future research should address interventions that attenuate this muscle loss. **Keywords:** Muscle Thickness; Nursing Home; Inactive Lifestyle; Sarcopenia.
Interventions for age-related visual problems in patients with stroke: A Cochrane systematic review

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Background: The prevalence of eye problems and visual impairment increases with age. As the incidence of stroke also increases with age, a significant proportion of stroke patients will have concurrent visual problems. The interaction between the sequelae from stroke, stroke related co-morbidities and age-related visual problems will be complex and the effect of interventions may differ, compared to the wider population. The nature and outcome of interventions for age-related visual problems may be different in patients with stroke.

Objectives: The aim of this Cochrane systematic review is to determine if interventions for age-related visual problems improve functional ability following stroke.

Methods: We searched the relevant Cochrane Trials Registers and nine electronic bibliographic databases including: MEDLINE, EMBASE, and CINAHL (1982 to December 2009). We also searched reference lists and trials registers, hand searched journals and conference proceedings and contacted experts.

Selection Criteria: Randomised trials in adults after stroke, where the intervention is specifically targeted at assessing, treating or correcting age-related visual problems, or improving the ability of the patient to cope with visual impairment. Primary outcome was functional ability in activities of daily living and secondary outcomes included functional ability in extended activities of daily living, visual acuity, visual field, falls, depression, and discharge destination.

Results: We considered 7357 titles, 460 abstracts, and 85 full papers. We identified no studies for inclusion in this review.

Conclusions: There are no studies that can be used to direct practice in stroke patients with age-related visual problems. Evidence relating to the general population with age-related visual problems is available from other Cochrane reviews, but no subgroups of stroke patients are identified within them. The ways in which future trials and reviews address this complex issue will be discussed.

Keywords: Vision; Stroke; Cochrane Review; Functional Ability.

Community public-private partnership program-physiotherapy rehabilitation corner for institutionalised elderly

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Introduction: Elderly living in old age homes frequently faced gradual decline in balance, functional mobility, and gait stability. It is not sure whether a collaboration of old age home (OAH) and community physiotherapy (CPT) in setting up of a rehabilitation venue to provide physical and mobility training can enhance functional outcomes of the institutionalised elderly. Objectives: A designated venue ‘Physiotherapy Rehabilitation Corner’ was established. CPT and OAH staff delivered physical and mobility training. The program was started from June to December of 2011. Methods: 3 old age homes participated as pilot to establish the rehabilitation Corner. The training program was designed by physiotherapist (PT). 8 sessions were led by PT and further 4 sessions were led by OAH staff alone and
supervised by PT. The rehabilitation program included mobilising/strengthening exercise for upper and lower limbs, functional and gait training which lasted for 60 min. The outcome measures of baseline and post-12 sessions training which included modified functional ambulatory categories (MFAC), Berg Balance Scale (BBS), Modified Rivermead Mobility index (MRMI), Timed up and go test (TU&G) and 6 min walk test (6MWT) were recorded to monitor the progress of each elderly. **Results:** 22 elderly participated in the training program. After completing 12 sessions of physical training, a Wilcoxon Signed Rank test was conducted to evaluate five objective outcomes. The results indicated a statistically significant difference: Wilcoxon Signed Rank Test and Median-(Pre/Post) MFAC: \( Z = -4.11 \ T = 0.001 \) (4/5); BBS: \( Z = -4.11 \ T = 0.001 \) (15/36); MRMI: \( Z = -4.12 \ T = 0.001 \) (21/31); TU&G: \( Z = -4.01 \ T = 0.001 \) (74/45); 6MWT: \( Z = -4.1 \ T = 0.001 \) (31/54). **Conclusion:** The results of this pilot program organised by joint effort of CPT and OAH showed improvement in functional outcomes and gait stability of elderly. This pilot program could be a pioneer model for better continuation care for institutionalised elderly. **Keywords:** Care Homes; Mobility Training; Measurement of Activity; Rehabilitation.

**Velocity of movement during ankle strength and power training with elastic resistance bands in older patients attending a day hospital program**

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Power training may be more beneficial for older adults than strength training, because many daily activities are more affected by power losses with age than strength losses. However, most power training programs do not actually measure the velocity of training so it is unclear how fast the training is. This could explain why some studies have not shown additional benefits with power training as compared to strength training. Additionally, very little research has been done on power training using elastic resistance bands. Because they are portable and inexpensive they could provide a desirable means of conducting power training programs, particularly for de-conditioned older adults. The purpose of this study was to determine the velocity during strength and power training, with elastic resistance bands, in older adults attending a day hospital rehabilitation program. Nine older patients were trained for power and strength of the ankle (plantar flexor and dorsiflexor) muscles using elastic resistance bands for 4 to 6 weeks. Training sessions were filmed to assess the velocity of training using Proanalyst software. Power training occurred at faster peak velocities as compared to strength training \((p < 0.001)\) for both muscle groups. However, there were significant differences for average velocity only during training of the plantar flexors \((p < 0.001)\). Overall, there was a wide variability observed between subjects in velocities at which they trained, and overlap was found between velocities for strength and power training across individuals. The results of this study suggest that researchers should monitor velocity during different types of training in older adults, particularly when examining the differences between training that is expected to have different velocities. Also, future studies could examine the benefits of strength and power training, based on the actual velocities that are attained by participants during their training sessions. **Keywords:** Power Training; Resistance Bands; Rehabilitation; Hospital.

**An augmented exercise programme in the acute setting can improve mobility and quality of life in frail hospitalised older patients: A pilot trial**

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Objective: Functional decline is experienced by up to 50% of older hospitalised patients. Frailty may influence this decline. A pilot trial was conducted to determine the levels of frailty in our older hospitalised population and the effects of augmented exercise on length of stay, function, and quality of life. Methods: A controlled pilot trial was conducted over an eight-week period in an acute setting involving medical in-patients over 65. Patients referred for physiotherapy were screened and if eligible for participation, were alternately allocated to the usual care group (three times weekly physiotherapy) and the intervention group (usual care augmented with two half-hour exercise sessions daily, five times weekly). Differences from baseline within and between groups were compared for the following parameters: frailty (handgrip strength); physical ability (Short Physical Performance Battery; Barthel Index); falls (number of falls, MFES); Depression (ABC Depression Screen); and Quality of Life (EuroQol-5). Results: Of the 185 older patients admitted during the trial, 55 were screened. Forty-two (76.4%) of the patients were categorised as frail. Forty of these were eligible for the trial; 20 patients to each group. Groups were comparable at baseline. On discharge, the intervention group showed better physical ability (SPPB: p = 0.03) and quality of life (EQ-Act: p = 0.02, EQ-VAS: p = 0.001) than the control group with their median length of stay 2 days less than the control group. The cost of running the service for eight weeks was approximately €778. Conclusion: These results are encouraging and support the value of a large randomised controlled trial. Keywords: Mobility; Quality of Life; Frailty; Intervention; Physical Ability; Costs.

Chair based exercise in frail older people: A systematic review

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Introduction: Frail older people are usually unable to undertake high intensity exercises with proven benefit. Consequently lower intensity chair based exercises (CBEs) are provided despite uncertainty over their effectiveness. We undertook a systematic review to examine the effects of CBEs in frail older people. Method: A systematic search was performed for CBE studies in populations who were frail and aged over 65 years published 1990-2010 in electronic databases supplemented by other sources. Quality of papers and reporting were performed by using the Jadad and PRISMA methods respectively. Results: The search identified 164 references: 42 duplicates were removed, and the papers/abstracts of the remaining 122 were reviewed, 116 of which were excluded leaving 6 for analysis. Number of participants in the 6 studies ranged from 20 to 82. Two studies showed no obvious benefit from CBE (Nicholson 1997, Thomas 2003). The others showed some evidence of benefit in the domains: Mobility and Postural Stability (Baum 2003, Hruda 2003,); Cardio-respiratory Fitness (Witham 2005); Mental Health (Hruda 2003, Van de Winckel 2004). No harmful effects were reported in any of the studies and compliance with CBEs was generally good in the populations studied. 26 different outcome measures were used, grouped in 3 domains: A) Mobility and Postural Stability (including timed up and go, timed walk, Berg balance, chair stand, , physiological profile, grip strength); B) Cardio-respiratory fitness (including respiratory fitness, heart rate, Guyatt chronic heart failure, accelerometry); C) Mental Health (including Becks depression inventory, Amsterdam dementia screening, falls efficacy confidence measure). All 6 studies were of low methodological quality (Jadad score up to
Conclusion: The quality of the evidence base for CBEs is low. Large well designed randomised controlled trials to test the effectiveness / cost-effectiveness of CBE’s required. Keywords: Frailty; Chair Based Exercises; Review.

Experiences of a high-intensity functional exercise programme among older people dependent in activities of daily living
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The purpose of this qualitative study was to describe the experience of participating in a high-intensity functional exercise programme among older people dependent in activities of daily living and living in residential care facilities. The informants had participated in an exercise intervention based on the High Intensity Exercise Program (HIFE) including exercises with the purpose to improve lower limb strength, balance, and gait ability. The training was individualized and intended to be performed at high intensity, i.e. to fully challenge the individual’s capacity. The exercise took place in the facilities, in small groups supervised by physiotherapists. The sessions lasted 45 min and there were 29 sessions during 13 weeks of intervention. Nine exercise participants, six women and three men, aged 73-91 were selected for interviews about their experience of participating in the exercise programme. Qualitative content analysis was used in analysing the interviews. The findings show that the informants, despite extensive physical impairments, advanced age, and multiple diagnoses displayed a belief in positive effects of the programme, a strong desire to be active, and the will to strive to avoid further loss of capacity. They were struggling with failing bodies that constituted barriers to exercise. Support from the supervisors and belief in personal success facilitated performance of the exercise. The informants told of physical and mental improvements that affected their daily life positively and that exercising in a group was stimulating and created a sense of togetherness. The effort was seen as worthwhile because participating in strenuous exercise could imply that they might overcome bodily limitations to achieve increased vitality and improved quality of life. Keywords: High Intensity Exercise Program; Strength; Balance; Gait.

Supervised balance and strength training predictors of participation among the population 75 years and older
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Introduction: Despite the recognized health benefits, relatively few older adults participate in strength training. Objectives: To define the characteristics of older adults that are associated with non-participation in supervised balance and strength training after comprehensive geriatric assessment. Methods: The data of this study is part of the Geriatric Multidisciplinary Strategy for the Good Care of the Elderly (GeMS), a population-based intervention study. Participants (n = 339) were home-dwelling persons of the intervention group. They got individually tailored counselling by physiotherapist and an opportunity to participate in supervised, group-based strength and balance training at the gym once a week. Data collection included self rated health, co-morbidities, sedative load of drugs, cognition (Mini Mental State Examination), physical activity (Grimby), functioning in instrumental activities of daily living (IADL, Lawton & Brody), grip strength and balance by Berg Balance Scale (BBS) and Timed up and Go (TUG) test. Results: Of the 339 participants (75 to 98 years old, 72%
female) 157 (46%) did not initiate the training. The non-participants were older (p < 0.001), physically less active (p < 0.009), had shorter education (p < 0.001), more co-morbidities (p < 0.011), more often sedative drugs (p < 0.001), more difficulties in IADLs (p < 0.001), lower grip strength (p < 0.001) and more balance problems by the BBS (p < 0.001) and TUG (p < 0.001) compared to persons who participated in the training. In multivariate logistic regression analysis, impaired cognition and lower grip strength were independently associated with non-participation. **Conclusions:** In community-dwelling older adults, cognitive impairment and weak grip strength predicted independently non-participation in balance and strength training. In the future, more emphasis should be placed to lower participation threshold of those older people with more cognitive limitations and less strength. **Keywords:** Strength Training; Balance; Physical Activity; Cognitive Impairment.

**WORKING WITH PARKINSON’S AND POST POLIO PATIENTS**

**Invited lecture:** Assessing exercise capacity and interpreting outcomes for people with Parkinson’s in the real world

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There remains controversy and confusion for exercise professionals between what we are told we should assess in people with long-term conditions (often older adults with multiple-pathologies), how this is measured in research articles and what is actually achievable for the professional working in clinical practice or in the fitness industries (Nieman 2011, Kaminsky 2010, Durstein 2009). This issue is further complicated now health and the benefits of socialisation are being driven through group-work in preference to cost-prohibitive individualised interventions. Using Parkinson’s as an exemplar, the session will start by providing a research evidence-informed overview of the value of exercise for people with the condition. This will include a multitude of assessments recommended to monitor fitness components of cardio-respiratory factors, power, flexibility, muscular strength and endurance, comparing these ‘gold-standard’ assessments to field-tests and practice. Information will be presented on interpretation of outcomes along the continuum of individualised, single-pathology health-research measures to those of group-work for people with multiple-pathology who participate in activity for social benefits as much as physical benefits. **References:** Durstein L Ed. (2009). ACSM’s exercise management for persons with chronic diseases and disabilities. American College of Sports Medicine 3rd Edition. Champaign, IL, Human Kinetics; Kaminsky L Ed. (2012). ACSM’s health-related physical fitness assessment manual 3rd Edition. Philadelphia, Wolters Kluwer, Lippincott Williams and Wilkins; Nieman D (2011). Exercise testing and prescription: A health-related approach 7th Edition. New York, McGraw Hill

**Adapting postural responses on the basis of constraints imposed by a voluntary task in Parkinson’s disease patients**

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**Objective:** This study assessed the effects of stability constraints of a voluntary task on postural responses to an external perturbation in subjects with Parkinson’s disease (PD) and
Methods: Eleven subjects with PD and 12 control subjects were perturbed with backward surface translations during standing and performing two versions of a voluntary task: holding a tray with a cylinder placed with the flat side down (low constraint - LC) or with the rolling, round side down (high constraint - HC). Participants performed alternating blocks of low and high constraint trials. Results: PD participants accomplished the voluntary task as well as controls, showing slower tray velocity in the high, compared with the low, constraint condition. However, the latency of postural responses was longer in the high constraint condition only for control subjects. Control subjects presented different patterns of hip-shoulder coordination as a function of task constraint whereas PD subjects had a relatively invariable pattern. Initiating the experiment with the high constraint task led to (a) decreased postural stability in PD subjects only, and (b) reduced peak hip flexion in control subjects only. Conclusion: These results suggest that Parkinson’s disease impairs the capacity to adapt postural responses to constraints imposed by a voluntary task. Keywords: Parkinson’s; Voluntary Task; Posture; Stability.

Leisure activity among people with Parkinson’s disease: Preferences, perceived benefits and reasons for abandonment

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Background: People with Parkinson’s disease (PwPD) reduce their activity levels post-diagnosis but the reasons for this are unclear. Aim: To ascertain specific information about leisure activity among PwPD (preferences, benefits, and reasons for abandonment) generating ideas for promoting continuity and positive change and avoiding unnecessary dropping out. Method: Questionnaires were distributed via 30 branches of Parkinson’s UK branches across central southern England. Results: 223 PwPD returned questionnaires: 194 answered questions about their leisure preferences and 185 answered questions about abandoned activities. Among an extensive and diverse range of activities listed (covering outdoor activity, exercise, sport, relaxation, intellectual pursuit, creativity, group activity and travel), the most frequent (along with their most frequently perceived benefits) were: walking (for keeping active and being outdoors), gardening (outdoors, active and relaxing), swimming (active and relaxing), bowling (company and activity) and socialising (company and enjoyment). Key reasons for abandoning activities included fear of falling or other danger, fatigue outweighing benefits; performance limitation; and practical and emotional (partially PD-specific) issues of access, symptoms and disease management. Conclusion: This PD-specific information about the pursuit and benefits of, and barriers to, leisure forms an original data set that will challenge many preconceptions about how this group of people makes choices about continuing or abandoning activity. The responses raise questions about the degree to which general advice about staying active as part of healthy ageing is applicable to people with PD. The major themes highlight a) avenues for better tailored health promotion and b) the potential improvements in participation that relatively minor changes in leisure provision could bring for this and other groups of elderly people. Keywords: Parkinson’s; Health Promotion; Motivation and Behaviour Changes.

Ability of Parkinson’s disease patients improve with multimodal exercise program

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UNESP Univ Estadual Paulista, Brazil
Objectives: This study aimed to evaluate the effect of a long-period multimodal exercise program on balance, mobility, and clinical status of Parkinson’s disease (PD) patients.

Methods: Thirty-three PD patients were assigned into two groups: a training group (TG – n = 22; aged 67.23+8.39 years) and a control group (CG – n = 9; aged 71.56+8.50 years). The TG patients were enrolled in a 6-month multimodal exercise program. This program was designed to improve physical capacity components and to reduce PD impairments. Balance and mobility were assessed immediately before and after the training protocol using the Berg Balance Scale (BBS), the Time to up and go test (TUG) and the Posture Locomotion Test (PLM). Also, clinical variables were assessed (disease stage and impairments).

Results: The TG showed an improvement in the TUG (p = 0.006) and PLM (p = 0.048) tests, while CG were not influenced by the 6-months period (p = 0.88 and p = 0.67). Both groups showed no differences for BBS (TG: p = 0.15; CG: p = 0.27) and for their disease impairments – assessed through the Unified Parkinson’s disease Scale (p > 0.27).

Conclusions: Long-term multimodal exercise programs are able to improve mobility of Parkinson’s disease patients and therefore should be used on clinical day-life.

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Keywords: Balance; Mobility; Parkinson’s; Multimodal Exercise Programme.

Adherence to physical activity through the development of a physiotherapy-led ‘exercise community’

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Public Health policy seeks to maintain health and delay disability in older adults using partnerships with providers of exercise programmes sustainable into the longer term (DH 2011a & b). Awareness of physical and psychological benefits of activity alone does not ensure exercise programme adherence (Bailey & McLaren 2005). Concepts exploring persistence in exercise participation (Deci & Ryan’s 1985 self-determination theory; Prochaska & Marcus 1994 transtheoretical model) mandate social interaction (Pentecost & Taket 2011); this aspect will be considered in this presentation. In 2000, a physiotherapy-led community class for people with Parkinson’s was established with an evidence based rationale to improve posture and balance through exercise (Webber & Ramaswamy 2003); the ethos of social benefits from exercising with peers fitted the criteria of funding organisations (Parkinson’s UK [Sheffield], and local Council Grants). The successful initial 12-week trial has evolved into the Full Monty Club, the exercise arm of the Sheffield Branch of Parkinson’s UK and runs independently of National Health Service classes (education and activity promotion courses for recently diagnosed people). Following small-scale independent research projects completed by undergraduate and postgraduate local university students over the past two years, the Club now offers long-term posture and balance classes thrice weekly, circuit classes for strength and flexibility, hydrotherapy for 1: 1 on specific issues plus aquarobic sessions to music, building fitness and endurance. Later in 2012, a walking group is to be added to the Club facility. Evolution has occurred through a combination of participant enjoyment, promotion of fun, support through additional social activities with family and friends creating a sense of community and belonging for participants; this has positively influenced willingness to attend. Future research should examine mechanisms that promote community in exercise. Keywords: Adherence; Physical Activity; Motivation and Behaviour Changes; Physiotherapy.
Lifestyle physical activity in people aging with a disability: A study of persons with post-polio syndrome

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Being active in all parts of life is defined as ‘lifestyle physical activity’ (LPA), and is important for our physical as well as mental health. However, persons with neurological disabilities are not engaged in LPA as much as nondisabled persons. Post-polio syndrome (PPS) is a disabling condition that appears in those with an acute poliomyelitis infection after decades of stability. Persons with PPS are advised to be physically active according to their individual needs and preferences, but there is very limited information about their engagement in LPA. The purpose of this study was to describe the amount of LPA and the type of activities that older persons (age > 50 years) with PPS are engaged in. 

Participants: A total of 34 men and 27 women (mean age 66 years) with verified PPS.

Main outcome measures: Physical Activity and Disability survey (PADS) is a semi-structured interview developed at the National Center on Physical Activity and Disability in Chicago, USA. The survey consists of six subscales: leisure; exercise; household activities; work/school; therapy; and wheelchair users. The original PADS has good validity and reliability in populations with disability and chronic health conditions. The instrument was translated and adapted into Swedish. Life satisfaction was assessed with the Life Satisfaction Questionnaire (LiSat-11).

Results: Preliminary results indicate a mean total activity level of 148 min/day (SD 88, range 54-539). The major part of the activities was household activities (mean 88 min/day). The total activity level was not related to the participants’ sex, age, use of assistive devices or living conditions. Persons with a higher level of activity were significantly more satisfied with their life as a whole. 

Conclusion: Persons with PPS are physically active to a large extent. Much of their time is spent in household activities, which may be a target for future health promotion. Keywords: Post-polio syndrome; Home Exercise; Lifestyle Physical Activity; Quality of Life.

THE USE OF Pedometers and Steps/Cadence Symposia

Invited lecture: Behaviour change plus pedometer in increasing physical activity in sedentary older women

Johnson, Derek W

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Practical and effective interventions are needed to increase activity in sedentary older populations. A brief behavioural change intervention consisting of goal setting, planning, self-monitoring delivered with or without a pedometer was compared with no treatment in a prospective study of 204 sedentary community dwelling women aged ≥70 years (average age 77 years). The primary outcome was daily activity counts assessed by accelerometer over 7 days prior to treatment, at 3 months and at 6 months. Secondary outcomes included lower limb function, health related quality of life, anxiety, depression and falls. The psychological mediators of behaviour change assessed included intention, perceived behaviour control, action, and coping planning. 179 women completed the trial with most dropouts from the behaviour change alone condition (15/68). Over the first 3 months, activity increased reliably more in the intervention groups than the control (which did not change). Pedometers did not add to the effects of the behaviour change techniques. The increase in activity was
not maintained at the 6-month assessment. The psychological and behavioural processes mediating the change in activity, and the failure to sustain it, will be discussed. **Keywords:** Sedentary; Behaviour Change; Measurement of Activity; Accelerometers.

**Increasing awareness for physical activity of older adults with diabetes**

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**Background:** Type 2 Diabetes Mellitus (T2DM) is an increasing prevalent chronic condition amongst the older population, with high levels of morbidity and mortality. **Aim:** To increase the awareness of low literate older adults, in a rural setting, with T2DM, for the importance of physical activity and exercise (PA&E). **Method:** A health promotion program of 7 weeks was implemented. The outcomes assessed were knowledge about PA&E, adherence to daily steps register (pedometer), and changes in PA levels. **Results:** Most participants increased their knowledge on physical activity practice, namely about the minimum exercise levels recommended to obtain health benefits (68.4% participants); the difference between physical activity and exercise and the number of daily steps recommended for their age and health benefits of walking (32% participants). Attendance rate for the exercise session was 63.6%, of which 80% felt at least confident during the session; 100% felt autonomous in performing global exercise and 50% concerning local exercise. No one felt that the session was difficult and 91.6% referred no fear of falling or of movement. As for the diary, the number of registrations varied between everyday and 19 days (76%), and 45% increased their daily steps. The daily physical activity level varied greatly consisting mainly of household work, and exercise was focused on walking between 180 and 21.25 min/day. **Conclusion:** This program was implemented in a rural setting with older diabetic adults, with low educational levels (max. 4 years). Overall, the program was effective in increasing participant’s knowledge concerning the importance of physical activity and exercise and physical activity level through daily steps. There was a very positive response, with a request for the continuity of the exercise sessions. Long-term follow up is recommended to assess the maintenance of the changes obtained. **Keywords:** Diabetes Mellitus; Health Promotion; Physical Activity; Exercise; Awareness.

**Examining objective and perceived distance to neighbourhood destinations and associations with walking for transport**

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While studies on built environment correlates of walking among seniors are increasing, there is a need to understand how perceptions and objective measures of the same built environment features work together to influence walking. Our aim was to examine differences in perceived and objective distance for older adults who walk to destinations, and to explore the mediating effect of perceived distance on objective distance and walking. Study participants (n = 325) were residents of 32 retirement villages in Perth, Australia. They reported perceived walking time (five-point scale) to 10 destination types outside but nearest their village: local shops; supermarkets; general services; health services; hairdresser/beauty salon; fast-food/takeaway; eating/entertainment facilities; public transport; recreational facilities; and public recreation areas. If used within the previous month, residents...
indicated whether they had walked there. Various sources were used to obtain objective data which were used to calculate road network distance (in kilometres) from the village to the same destinations. On average, residents were aged 76.8 years (SD = 7.4) and 68% were female. Correlation coefficients for perceived and objective distances ranged from 0.147 to 0.532. For most destinations, perceived and objective distances were significantly shorter for residents who walked compared with others. For example, perceived (M = 2.24, SD = 1.22) and objective (M = 0.63, SD = 0.56) distance was shorter for residents who walked to local shops compared with perceived (M = 3.55, SD = 1.26) and objective (M = 1.17, SD = 0.77) distance for others. Objective distance to local shops, supermarkets, general services, health services, and public transport were negatively associated with walking and perceived distance mediated 11-53% of these relationships. This has implications for creating supportive built environments with proximate destinations and the interventions required to encourage more walking among seniors. **Keywords:** Walking; Physical Activity; Perceived and Objective Distance; Transport.

**Cadence of older women walking at self-selected and music guided pace**

**Rowe, David A; Peacock, Leslie; Sutherland, Rona; Hewitt, Allan**

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**Introduction:** Despite guidelines for moderate intensity health-enhancing physical activity, older adults’ walking intensity is rarely monitored or regulated in walking interventions. Consequently, we determined self-selected walking cadence (steps/min) and intensity (METs) in older women and investigated their ability to match walking cadence to music tempo (beats/min). **Methods:** Older women (N = 30; age = 71±7 yr; height = 1.58±0.08 m; weight = 63.64±11.54 kg; BMI = 25.52±4.31 kg/m²) completed three 4-min treadmill walking trials at self-selected slow, moderate and fast speeds during which cadence and energy expenditure were measured. Three overground trials of at least 5 min were then completed using music tempo matched to the three treadmill cadences, played through a portable music player. Data were analyzed using one-sample t-tests, Cohen’s d, and Bland-Altman plots. **Results:** Mean energy expenditure and cadence during the three treadmill trials were 3.52±0.88 METs and 112±12 steps/min (slow), 3.99±1.05 METs and 118±11 steps/min (moderate), and 4.58±1.02 METs and 124±12 steps/min (fast), which were all significantly (p < .005) and meaningfully (d = 0.58-2.09) higher than moderate intensity energy expenditure (3 METs) and cadence (100 steps/min; Tudor-Locke & Rowe, in press). During overground walking trials, most participants maintained a cadence within 3 steps/ min of the prescribed music tempo, and the trivial (d = 0.08-0.11) mean differences were due mainly to one outlier walking considerably faster than her prescribed music tempo. **Conclusions:** During self-selected slow, moderate, and fast walking, older women walk at above-moderate intensity. At a variety of music tempi between 86 and 158 beats/min, older women are able to match walking cadence to music tempo. Music therefore has promise for regulating walking pace in older women, and they are able to maintain above-moderate intensity walking for a series of short continuous bouts accumulating to approximately 30 min. **Keywords:** Walking Cadence; Music Tempo; Self-Selected Pace.

**Walking in the cement forest: A health enhancement and pedometer-determined ambulatory (HEPA) program in Hong Kong**

**Leung, Angela Y M; Tse, Michael; Cheung, Mike K T; Shum, Wai C; Lancaster, Jeanette; Lam, Cindy LK**
Background: Due to lack of infrastructures in the public estates, many older adults were sedentary. A capacity building project named ‘Health enhancement and pedometer-determined ambulatory (HEPA) program’ was developed to assist home-dwelling older adults develop walking exercise habits in their own neighborhood and built up social support for regular physical activity. Objectives: This study aims to describe the intervention used to motivate the sedentary older adults and report the change of their walking capacity and body strength after the 10-week walking. Method: A pre-and-post intervention design was used. Number of steps taken per day, upper and lower body strength, lower body flexibility, and quality of life were measured. Results: A total of 1,408 older adults participated in various activities in the HEPA program. Among these, 205 completed the 10-week walking and all health assessments. After the 10-week walking, participants’ average number of steps per day increased from 6591 (Week 1) to 8934 (Week 10) (increased by 36%). Their lower body strength (mean difference, m.d. = 1.71, p < 0.001), upper body strength (m.d. = 1.29, p < 0.001), aerobic fitness (m.d. = 20.74, p < 0.001) significantly increased after 10 weeks. Their quality of life in physical health (m.d. = 2.86, p < 0.001) and mental health (m.d. = 2.11, p < 0.01) was significantly improved. Conclusion and Discussion: The HEPA program successfully increased participants’ walking level and improved their body strength and quality of life. Social network support was built and local environment was utilized to make walking possible and enjoyable. Keywords: Walking; Body Strength; Quality of Life; Social Network, Environment.

INSIGHTS IN FRAILTY ASSESSMENT
Invited lecture: From muscle activity to physical performance—Insights in frailty assessment
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Frailty is a geriatric syndrome that is often easily recognized but difficult to diagnose. Characteristics of frailty include a mix of physiological, psychological, social, and environmental factors that initiate a state of vulnerability leading to eventual adverse health outcomes. These characteristics are uniquely expressed within each individual depending upon their available assets (i.e. health, muscle strength, family support) and deficits (i.e. neurological disease, disability) making it a challenging syndrome to diagnose. Clinicians and researchers consider frailty as a spectrum of phenotypes (non-frail, pre-frail, and frail) or indexed by an accumulation of age-associated symptoms. Frailty identification is often missed in its early stages (prefrailty) when interventions could be most productive. However, to-date there is no agreement on how to screen for frailty. Recent evidence from our laboratory has demonstrated that daily muscle activity (electromyography) recorded over 8-hours of a typical day differs between males and females, young and old, and might be used as a tool to identify changes in frailty earlier than current assessment means. In addition, the evaluation of physical activity using a combination of measurements (accelerometers, global positioning systems, and questionnaire) provides important information about when older adults transition across frailty thresholds. Older adults living with neurological disorders such as Parkinson’s disease (PD) provide a unique model to explore frailty, especially females who are at greatest risk of becoming frail following PD diagnosis. This symposium provides
insight into how various physical activity assessment tools used in combination with EMG can effectively diagnose frailty before it manifests into functional dependence and death. Understanding the many faces of frailty is crucial to improve the lives of our aging population. **Keywords:** Frailty; Muscle Activity; Physical Performance; Quality of Life.

**Invited lecture: Age-related changes in muscle architecture—A signature of sarcopenia**

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Sarcopenia is a main cause of frailty in old age (Narici & Maffulli, 2010), affecting about 50% of individuals over 70 years of age (Janssen et al. 2000). Early detection of sarcopenia is thus of primary importance for the introduction of countermeasures against musculoskeletal frailty. So far, diagnosis of sarcopenia has been based on appendicular skeletal muscle mass (ASM) assessed either by DEXA, bioelectrical impedance analysis, MRI or CT. Although the use of these indexes may be practical for clinical purposes, their accuracy and/or cost, have been questioned (Pahor et al. 2009). The present study investigated whether these structural changes could be used as biomarkers of sarcopenia. The investigation was performed on 24 active young (AY) aged 18-35 yr, 27 active older (AO) aged 67-82 yr, 24 master athletes (MA) aged 67-96 yr and 31 frail older (FO) individuals aged 65-94 yr. Fascicle length (Lf) and muscle thickness (t) of the vastus lateralis muscle were measured using ultrasonography and the ratio of Lf to t was calculated for each participant. Statistical significance of differences was assessed with a one-way ANOVA followed by a Tukey post-hoc test. The Lf/t ratio was 3.92±0.67 in AY, 4.58±0.64 in AO, 4.38±0.63 in MA and 5.8±1.27 in FO. This ratio was 17% higher in AO than in AY (P < 0.01) and 47.7% higher in FO (P < 0.001). Instead, no significant differences between AY and MA were found. The observed increase in the Lf/t ratio suggests that the larger is the degree of sarcopenia, the greater is the disproportion between the loss sarcomeres in parallel and those in series. Instead, the unchanged Lf/t ratio in MA, suggests that regular high-intensity physical activity preserves muscle geometric proportionality. A change in the Lf/t ratio may thus be regarded as a specific ‘signature’ of sarcopenia; this could be useful for diagnosing this condition. Supported by EU FP7 grant No 223576, project MYOAGE. **References:** Janssen I, Heymsfield SB, Wang ZM et al. (2000) Skeletal muscle mass and distribution in 468 men and women aged 18–88 yr. J Appl Physiol 89:81–8; Narici MV, Maffulli N. Sarcopenia: characteristics, mechanisms and functional significance. Br Med Bull. 2010;95:139-59; Pahor M, Manini T and Cisari M. (2009) Sarcopenia: clinical evaluation, biological markers and other evaluation tools. J Nutr, Health & Aging, 13, 724-728. **Keywords:** Frailty; Markers; Muscle architecture.

**Socio-demographic determinants of worsening in frailty among community dwelling elderly in 11 European countries**

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**Background:** The rapid increase of frail elderly worldwide will have a substantial impact on healthcare systems. The frailty process may be delayed, or even reversed, which makes it
attractive for early interventions. However, little is known about the determinants of frailty state changes. The aim of this study is to compare socio-demographic determinants of worsening in frailty state in 11 European countries. 

**Methods:** Data of 14,424 community-dwelling persons aged >55 years, enrolled in 2004 in the Survey of Health, Ageing and Retirement in Europe (SHARE), were analyzed. Three frailty states were identified (non-frail, pre-frail, and frail) using Fried’s criteria, and frailty state changes over a two-year period were determined. Multinomial regression analyses adjusted for baseline frailty state were conducted to investigate whether sex, age, marital status, and level of education determined a worsening in frailty state in the total and country-specific European population.

**Results:** Of all individuals, 22.1% worsened, 61.8% showed no change and 16.1% improved in frailty state. Women, those aged ≤65 years, and lower educated persons showed an increased risk of worsening in frailty state. In Southern European countries, there was an earlier and larger increase in risk of worsening in frailty state in life which was more pronounced in women compared to men.

**Conclusion:** In Europe, persons aged 65 years, women, and lower educated persons are at increased risk of worsening in frailty state. Differences between countries indicate that interventions aimed at delaying the frailty process in Southern European countries should start earlier with more attention towards women.

**Keywords:** Socio-Demographic; Frailty; Europe.

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**HEALTH PROMOTION AND MOTIVATION TO EXERCISE**

**Interventions in community settings that prevent or delay disablement in later life: An overview of the evidence**

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**Background:** The population of older people in the UK is expected to rise rapidly over the next 20 years and identification of effective interventions, that prevent functional decline, is a public health priority. **Aims:** The aim of the review is to summarise the evidence for interventions in community settings that prevent or delay disablement in later life.

**Methods:** A search of review-level literature was conducted for the period September 1999 and 2010 of Ovid MEDLINE, EMBASE and CINAHL databases. It included interventions that aimed to prevent disablement of community dwelling older people (50+ years old). It excluded interventions carried out in institutional care and those focused on specific disease. The reviews were screened using the AMSTAR assessment tool.

**Results:** The search identified 62 reviews of complex interventions (comprehensive geriatric assessment n = 3, preventive home visits n = 9, falls prevention n = 17, case management n = 3) and specific interventions (exercise n = 15, nutritional interventions n = 3, information communication technology n = 5, social integration n = 3, vision screening n = 2, medication review n = 2). **Conclusion:** Overall, the evidence-base is limited by unstandardised use of outcome measures that, in some cases, are not robust. The most promising complex interventions include: assessment of risk factors; and direct referral to an easily accessible, comprehensive range of interventions that are tailored to need and include long-term follow up. There is consistent evidence that exercise can be beneficial, particularly in preventing falls. Exercise programmes for older people can improve strength, aerobic capacity, balance, and function. However, there is a lack of evidence to link gains in impairment and function with reduction of disability. The magnitude of effects of exercise interventions range from small to large, reduce with age and are smallest for the older age group (80+) and those with pre-existing disability.

**Keywords:** Intervention; Vision; Technology; Medication; Falls Prevention.
Physical activity behaviour in community dwelling older Brazilian adults

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Introduction: Physical Inactivity is a public health concern worldwide. Older adults exhibit the highest prevalence of physical inactivity compared to other age groups. Objective: To explore physical activity (PA) behavior of older Brazilians using the “stages of change” theoretical perspective. Methods: A stratified and randomized sample of 359 males and female from Rio Claro, Sao Paulo, Brazil older adults was interviewed. The participants were requested to answer the following question: “Do you perform moderate intensity PA in your free time, five or more days per week, for at least 30 min each day?” If the answer was yes, the interviewer asked whether the behavior had been performed for more (maintenance) or less (action) than six months. If the answer was no, three possible answers were possible: (1) I do not intend to start in the next six months (pre-contemplation); (2) I intend to start in the next 30 days (preparation). Results: A total 134 men (71±2.39 years) and 225 women (73±3.25 years) were interviewed. Eighty-two% of men and 78% of women reported their health as good. The proportion of men and women in each behavior stage were not present significantly difference (chi-square; p > 0.05). Approximately 40% of men or women were in the pre-contemplation stage, and less than 20% in the contemplation and preparation stages. Additionally, less than 10% of men or women were in the maintenance stage, and less than 30% in the action stage. Conclusion: The highest prevalence was observed in the pre-contemplation stage. Less than 30% of men or women reported being regularly physically active (action stage) during the free time. These findings suggest that physical inactivity among Brazilian older adults continues to be a major public health concern. Keywords: Physical Inactivity; Health Promotion; Measurement of Activity; Brazil.

Active or sedentary? The perceived implications of a lifestyle

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Background: Regular physical activity offers a range of physical, psychological, and social benefits which may ultimately enable maintained independence and quality of life. However, many older adults in the Western world are insufficiently active. Aim: To gain a better insight into the influencing factors of regular participation in physical activity this comparative qualitative study considered both the experiences of sedentary older adults and master athletes. Methods: Participants were 10 master athletes and 10 community dwelling sedentary adults (age range 60-80 yrs). Semi-structured interviews were conducted in accordance with the tenets of Interpretative Phenomenological Analysis. Results: The narratives of older adults were markedly different regarding their “way of life.” Master athletes relinquished their active experiences by grabbing life and making the most of it regardless of age. They actively and vigorously challenged themselves both physically and mentally. They live their lives with vigour and pushed the boundaries of ageing. They were able to persevere, plan, and pace themselves in their active lives. Being active provided invaluable personal, social, physical, and mental challenges. The sedentary older adults had a ‘fearful’
approach to ageing. They remembered negative past sport and activity experiences, feared further injury, and cited lack of time or physical ill health and pain as a reason for their inactivity. Sedentary older adults did not connect tiredness or a decline in function with their lifestyle. **Conclusion:** It appears that being active throughout one’s life is associated with self-regulatory skills, such as ability to plan, find solutions to physical, mental, and social problems. Interventions teaching self-regulatory skills may help sedentary individuals overcome potential barriers and cope more successfully with ageing. **Keywords:** Sedentary; Athletic; Physical Activity; Lifestyle.

**Physical activity in inactive and insufficiently active older Australians: Why, how, with whom and where?**

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**Background:** Despite the benefits of regular physical activity (PA) for physical and psychological health, the proportion of people doing sufficient PA for health benefits decreases with age. The aim of this study was to examine PA motivators and context preferences in Australians not engaging in sufficient PA for health benefits. **Methods:** Data were used from the 2009 HABITAT mail survey in Brisbane. Participants reported time spent in walking, moderate and vigorous activity, as well as their agreement with seven PA motivators (‘why’) and 14 activity context preferences (‘how, with whom, where’). Data were analyzed using descriptive statistics and Chi square tests. **Results:** Of the 2,041 respondents aged 60+ years, 472 (23%) were insufficiently active and 256 (13%) reported no PA. Mean age of these 728 participants was 63 years (SD 2.2) and 62% were female. Both groups ranked the PA motivators in the same order. The most common endorsed motivators were preventing health problems (95% insufficient PA vs 87% no PA; p < 0.05) and feeling good (92% vs 85% respectively; p < .05). PA context preferences were also ranked in the same order. More than 75% of participants in each group preferred activities close to home, involving little/no costs, and activities done alone. However, insufficiently active participants were more likely than participants reporting no PA to have a preference for activities done outdoors (61% vs 54%; p < 0.05) and against vigorous activities (57% vs 47%; p < 0.05). They also tended to prefer PA with people of the same age (55% vs 46%; p = 0.06). **Conclusion:** Activity motivators and context preferences were largely similar for inactive and insufficiently active Australians aged 60-67 years. These results are useful for informing the promotion, design, and implementation of PA programs for this population. **Keywords:** Health Promotion; Motivation; Physical Activity; Health Benefits.

**An investigation into whether the sports and fitness industry in Taiwan caters to senior citizens**

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Recent years, Taiwan’s demographic profile has aged rapidly because of the low birth rate and increased lifespan among the population. Currently, senior citizens account for over 10% of the population. Due to the fact that physical activity is crucial to senior citizens’ health, recreation and sports service providers should reposition themselves as health promotion advocates. However, the membership of gyms, sports, and fitness facility held by senior citizens in Taiwan is considerably low. To encourage the sports and fitness industry to target senior citizens, this study investigates the needs, motives, perceptions, and obstacles into
senior citizens obtaining gym memberships along with the attitudes the non-membership people hold toward the sports and fitness industry. This study explores seniors’ demands on fitness center and problems they have encountered as well as assess the reasons seniors who do or do not apply for gym membership. Results were obtained from 14 senior members and 54 senior non-members with semi-structured interview. For members, “commuting distance (64.3%),” “applicable fitness equipment (64.3%),” and “accompany (50%)” are important factors. Non-members report the main factors when they consider being memberships are “commuting distance (87.5%), “cost (87.5%),” “comfort and safety (68.8%)”, and “applicable fitness equipment (66.7%).” Moreover, senior citizens with gym memberships report a strong preference for aquatics and flexibility training classes. Senior citizens without gym memberships report that the main barriers to enrolment are “indoor environment” and “costly.” The results of this study have implications for the sports and fitness industry and are useful for sport and fitness industry to better cater and satisfy senior citizens’ needs. **Keywords:** Demographics; Taiwan; Gym Membership; Costs; Fitness Industry.

**Prevalence and factors associated with physical inactivity in the elderly in Spain**

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The aim of this study was to determine the prevalence and factors associated with physical inactivity among the elderly in Spain. This cross-sectional study used data from The Survey of Older Adults by “the Institute Of Aging And Social Services” (IMSERSO) in 2010. 2,535 individuals, 50.5% men and 49.5% women, aged >65 years, distributed in 17 regions of Spain, were interviewed by telephone. The physical activity was measured by the question “practice a sport or physical activity?” It was then categorized in a dichotomous yes (every day or once a week) and no (does not perform any activity). The independent variables were divided into two levels: socio-demographic characteristics (age, marital status, educational level, income, size of municipality) and social relations (satisfaction with relationships with family and friends). Data analysis was performed by binary logistic regression to calculate odds ratios and significance level of p < 0.05. The prevalence of physical inactivity was 70.1% (n = 1767). When held in the adjusted analysis, physical inactivity was significantly associated with increasing age (70-74 years, OR = 2.1, CI 95% = 1.7-2.7 and 75 years or older OR = 7.4, CI 95% = 5.7-9.4), municipality size (m 10 000 inhabitants OR = 1.8, CI 95% = 1.4-2.4), marital status (single OR = 2.3, CI95% = 1.4-3.7 and OR = 2.6 widower, CI 95% = 2.0-3.4), compared friends after retirement (OR = 2.4 equal; CI 95% = 1.4-4.1 and decreased OR = 2.4, CI 95% = 1.3-4.2). It is concluded that there is a high prevalence of physical inactivity among the elderly Spanish. Interventionist measures are needed to change this behaviour. Among the strategies to be adopted for this population group, there is high recommendation for additional incentives for physical activity groups and activities that enhance social relationships. **Keywords:** Physical Inactivity; Prevalence; Spain; Intervention; Measurement of Activity.

**Denton County Age Well – Live well**

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**Objective:** The Age Well - Live Well initiative was designed to unite existing organizations and businesses in a vibrant community to improve health and wellness for all ages in Denton.
County, Texas. The initiative is a grassroots community effort to encourage participants to achieve sustainable lifestyle changes. **Goals:** The goals of Age Well - Live Well are to enhance health and wellness by improving physical, social, emotional, occupational, spiritual, and intellectual health. Healthy lifestyles will be promoted by engaging the community in collaborative partnerships and volunteer efforts, creating an evidence-based, sustainable model. Denton’s Age Well - Live Well initiative can become a blueprint for creating sustainable partnerships in other communities to improve the overall health of their residents. **Strategies:** Age Well - Live Well will be a resource for the residents of Denton County by connecting, disseminating, and promoting community resources and programs that benefit all. Using evidence-based measures, existing programs will be brought together under a common umbrella. The objectives for the first year are to implement the existing fitness and nutrition programs: A Matter of Balance and exercise, partnering with the University of North Texas Wellbeing Initiative and Texas Woman’s University Institute for Women’s Health. The talent of older adults will be marshalled through the Emeritus College, Seniors in Motion, Senior Living Communities, and churches. To promote awareness of Age Well - Live Well, a current internet platform of an Aging and Disability Resource Center will be used, involving participant community, business, and government organizations. The mayor of Denton issued a challenge to have 100 businesses become Age Well - Live Well organizations by the end of the first year, implementing initiative goals. **Background:** Denton County has a population of 663,000, is the 9th largest county in Texas, and has been ranked as the 3rd healthiest. **Keywords:** Health Promotion; Wellbeing; Motivation and Behaviour Change; Balance.

**EFFECTS OF AGE AND SEDENTARY BEHAVIOUR ON FUNCTION**

**Effects of ageing on viscoelastic properties of the rectus femoris muscle in adult males**

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**Introduction:** Myotonometry offers an objective, portable, non-invasive way of testing viscoelastic properties (VP), such as tone and stiffness, of skeletal muscles. The present study examined the differences between VP of healthy young and older males. **Methods:** Forty-two healthy men were studied; 21 young and 21 older, mean and standard deviation (SD) for age and body mass index were 25.9 (4.4) years, 23.9 (2.5) kg/m² and 72.1 (4.9) years, 25.2 (3.4) kg/m² respectively. Participants were tested in supine lying with the leg extended and the muscle in a relaxed state. Viscoelastic properties of rectus femoris (RF) including decrement (elasticity), frequency (tone) and stiffness were measured using the MyotonPro (Muometria AS, Estonia). Damped oscillations of the muscle were recorded in response to a brief (15 milliseconds) mechanical tap applied by the probe with the device held perpendicular to the muscle surface. Two sets of 10 taps were taken and mean of the two used for analysis (t-tests). **Results:** The means and standard deviations for young and older males were: decrement 1.4 (0.2) and 1.8 (0.3), frequency 16.1(1.1) and 16.3 (1.7) Hz, stiffness 288 (22.5) and 322.2 (27.9) N/m respectively. Differences for decrement and stiffness between the groups were statistically significant (p < 0.001) for both. **Conclusions:** The MyotonPro enables rapid, objective assessment of viscoelastic properties, suitable for clinical/community settings. Age-related differences between the groups were greater decrement (lower elasticity) and stiffness of RF with ageing. The quadriceps muscles are important for mobility and the MyotonPro is potentially useful as a simple non-invasive device to detect decline in muscle characteristics with ageing and monitor effects of exercise.
interventions. Further studies of healthy females, other age ranges, and people with different levels of habitual activity are needed to provide reference data for assessing patients. **Keywords:** MyotonPro; Viscoelastic; Skeletal; Muscles; Mobility.

**Do grip strength and bone mass depend on adults’ past or present physical activity?**

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Long-term exposure to healthy life styles during the life course, such as always being physically active according to recommended levels, is expected to be associated with better health at older age. Data from long-term cohort studies are increasingly becoming available to study such hypotheses. In the 5th measuring round (2008-2013) of the Doetinchem Cohort Study we measured grip strength and bone mass for the first time. We studied whether grip strength and bone mass were associated with any past physical activity (5 or 10 years earlier) and/or present physical activity. Being physically active was defined as spending 3.5 hours or more per week on physical activities of at least moderate intensity. Handgrip strength (HGS, in kg) was assessed three times in the preferred hand using a hand-held dynamometer (Jamar) in sitting position. Bone mass was assessed with quantitative ultrasound measurements of the calcaneus, using a Hologic Sahara bone densitometer (Hologic Inc., USA) of which the quantitative ultrasound index (QUI) is used. Preliminary analyses of two-fifth (n = 1587, aged 40-80 years, 52% women) of the total cohort showed that past and present physical activity were independent associated with bone mass (QUIactpast = 100.4, QUIinactpast = 97.9, Pdiff < .05; QUIactpresent = 100.4, QUIinactpresent = 97.9, Pdiff < .03), adjusted for age, sex, body weight and smoking. For grip strength only present physical activity was associated (HGSactpresent = 38.4, HGS inactpresent = 36.9, Pdiff < .001), after adjustment for age, sex and length. This study indicates that whether long-term exposure to a physical activity lifestyle affects health later in life may depend on the health outcome under study. **Keywords:** Grip Strength; Bone Mass; Physical Activity.

**Mechanical muscle power in women and men aged 18-81 years: Influence of age and gender**

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**Introduction:** Muscle power is an important factor for activities of daily living and for managing acute situations such as stumbling. **Purpose:** This study explored the age-related deterioration in stretch-shortening cycle (SSC) muscle power and concurrent force-velocity properties in healthy women and men. **Method:** One hundred and eighty-eight women and 127 men (18-81 yrs) performed maximal vertical countermovement jumps and instantaneous vertical power (P) production was calculated throughout the entire movement by means of force plate analysis (1000 Hz). **Results:** Maximal SSC leg extension power expressed per kg body mass was greater for men compared to women (p < 0.001). As a novel finding, this gender difference progressively got smaller with increasing age. Further, the age-related decline rate in SSC power (W/kg per year) was ~50% greater in males compared to females. Peak power determinant velocity (VPpeak) was greater in men than women (p < 0.001) and
declined at a greater rate in men than women (-0.02 vs. -0.01 m/s per year) (p = 0.002). Vertical ground reaction force at peak power (FPpeak) was higher in men than women in younger adults only (18-34 yrs) (p < 0.001) and showed a steeper age-related decline in men than women (0.07 vs. 0.04 N/kg per year). **Conclusion:** Maximal leg extension power evaluated with a stretch-shortening cycle (SSC) movement is greater in men than women throughout life, but declines at a greater rate in men leading to a diminished difference between women and men at old age. **Keywords:** Muscle Power; Gender; Force Plate; Stumbling.

**Adopting an active lifestyle during adulthood is associated with a better health-related quality of life:** The Doetinchem cohort study

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**Background:** A lifelong healthy lifestyle is assumed to be most favorable for old-age health. Whether adopting a healthy lifestyle during adulthood is as good for health is unknown. **Objective:** The objective of this study was to examine health-related quality of life in adults who became physically active at recommended levels over a period of ten years compared to that in adults who remained persistently inactive or active in that period. **Methods:** Men and women aged 26-70 years in the prospective Doetinchem Cohort Study were examined every five years, with three examinations between 1995 and 2009. Being physically active was defined as spending 3.5 hours or more per week on physical activities of at least moderate intensity. Participants were categorized into those who became active (N = 618), remained persistently active (N = 1286), or persistently inactive (N = 727) over ten years. Health-related quality of life (SF-36) was measured at the 10-year follow-up. **Results:** Adults becoming physically active reported better physical functioning (1.7 points higher (95% CI 0.2 3.3), vitality (1.7 points higher (95% CI 0.2 3.3), and general health (2.7 points higher (95% CI 1.2 4.2) after ten years compared to persistently inactive adults, after adjusting for baseline quality of life and other confounders. The differences were more pronounced in women. No differences were found in health-related quality of life between adults becoming active and adults remaining active over ten years. **Conclusions:** These results suggest that adopting an active lifestyle according to recommendations result in a better health-related quality of life, nearly as good as that of adults who remained physically active over ten years. **Keywords:** Quality of Life; Physical Activity; Lifestyle.

**Eccentric strength preservation with aging can be angle dependent?**

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**Background:** Besides a progressive decline in muscle strength, the capacity to generate eccentric force seems to be preserved in older adults. However, descending stairs is a challenging task in old age, which contradicts the evidence that eccentric strength is preserved with aging. This study investigates the effects of age on isokinetic performance and relative force production over a functional range of motion. **Methods:** 11 younger (24.2 ±2.9 years) and 17 older men (62.6 ±2.7 years) were submitted to concentric and eccentric isokinetic
knee extension/flexion at 60°/s and 120°/s over a functional range of motion (90° to 30° of knee flexion). Age, contraction type, and angular velocity effects on isokinetic parameters were assessed by three-way ANOVA. Age differences on relative force production were then assessed by repeated measures ANOVA followed by Tukey’s post hoc test. The level of significance was set at p > 0.05. Results: The older group presented lower peak torque (Nm and Nm/Kg) than the younger group for both isokinetic contraction types (aging effect, p < 0.05). Maximal concentric and eccentric strength deficits in the older group ranged from 29-32% and 26-31%, respectively. Concentric peak torque was lower at 120°/sec than at 60°/sec for both groups (contraction and velocity interaction, p < 0.05). At the end of the range of motion, the older group could not maintain relative eccentric knee extension force (only at 60°/sec), which resulted in a torque deficit of 41-55% at the end of movement (80-85°).

Conclusion: In older healthy subjects, the production of eccentric knee extension force seems to be angle dependent. At the end of knee flexion, older subjects lose the capacity to generate eccentric quadriceps force, which may have a great impact on activities of daily living such as descending stairs. More studies, especially with the frail elderly, are needed to assess the mechanisms involved in eccentric force preservation with aging. Keywords: Muscle Strength; Knee Extension; Isokinetic Performance.

Interaction of brain derived neurotrophic factor gene and physical activity on cognitive functions in older people

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Introduction: Higher concentrations of brain derived neurotrophic factor (BDNF) were observed in physically active individuals. A single nucleotide polymorphism at codon 66 of the BDNF val66met gene has been associated with a poor cognitive performance as a result of the impairment on the BDNF secretion and intracellular trafficking. BDNF met-allele carriers have a significant lower activity-dependent expression of BDNF and this may reflect on impairments on cognition. Objective: To analyse whether physical activity can protect older people with BDNF met allele on the performance of cognitive functions between different genotypes of BDNF gene. Methods: twenty-five physically active older participants (67.6±5.7 years) and nineteen sedentary ones (65.3±8.2 years) completed clinical assessments and provided blood samples for genotyping. The Montreal Cognitive Assessment was applied to assess cognitive functions, and the level of physical activity was assessed by an appropriate questionnaire. One-way ANOVA and Scheffé’s post hoc test (p < .05) were applied for statistical analysis. Results: Cognitive performance by MoCa scores founded was: a) BDNF-val allele active group 24.2±3.4; b) BDNF-met allele active group 21.2±3.9; c) BDNF-val allele sedentary group: 22.0±4.0; d) BDNFmet allele active group 20.8±4.0*. The BDNF genotype with a met allele was found to be a moderator on the relation between performance of physical activity and cognitive functions. Physically active individuals with a BDNF-met allele showed similar scores compared to non-carriers BDNF-met allele (p = .66) on cognitive tests. Sedentary participants BDNF-met allele carriers showed significant lower levels of cognitive functions compared to non-carriers physically active ones (p = .02). Conclusion: BDNF-met polymorphism seems to be associated with poorer cognitive functions performance in sedentary older people individuals but not for those active ones. Keywords: Cognitive Function; Physical Activity; Neurotrophic Gene Factor; Sedentary.
The influence of age and practice on hemispheric asymmetry of isometric pinch force control

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Introduction: Just as lateralized cognitive functions have been shown to become less asymmetrical with aging (HAROLD model, Cabeza et al. 2002), Przybyla et al. (2011) have shown that this model extends to the neural control of trajectories and accuracies of reaching movements. We questioned whether the HAROLD model might also be applied to the reduction of asymmetry in isometric pinch force control in older adults. Further, we questioned whether five days of practice on an isometric control task might reduce any difference in asymmetries observed in young and old adults. Methods: Ten right-handed adults 18 to 25 and 60 to 74 were tested on their ability to coordinate the force produced by their thumb and index finger to trace a 45 degree line template from 0.98N force level to 3.43N (<5% of their maximum force) and to return by releasing force from that peak level to return to the start position. The thumb controlled horizontal movement and the index finger controlled vertical movement of a computer screen cursor. A perfect trial required equal forces applied by both thumb and index finger for both increasing and decreasing force. Participants completed 10 trials each with their right hand and left hand on each of 5 consecutive days. Results: Asymmetry indices of log time and RMSE of the young group were not different from those of olds, either on the first day of testing or throughout the practice sessions. The asymmetry indices of log time were significantly different for segment and indicated that participants displayed more asymmetry on segments approaching a target and reversing directions. Conclusions: These results may suggest that the age-related reduction of asymmetry (HAROLD model) applies primarily to tasks that require processing sensory information during the ongoing control of movement and not to tasks that require the initiation and organization of coordinated isometric contractions. Keywords: Isometric Control; Sensory Information; Cognition; Asymmetry.

SOCIAL GRADIENT AND PHYSICAL FUNCTIONING DECLINE ASSOCIATED WITH AGEING IN LARGE POPULATION-BASED STUDY IN THE CZECH REPUBLIC: THE HAPIEE STUDY

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Muscle strength is an important marker of ageing and helps to preserve self-efficiency and quality of life in social as well as physical domain. It has been also shown that there are large social differences in physical functioning, namely in Grip strength, Chair rise and Walk speed. There is limited evidence of these differences and ageing decline originating in countries of Central and Eastern Europe (CEE). In this study, we aimed to assess physical functioning decline associated with ageing as well as to evaluate social gradient in large population-based study in the Czech Republic. The random sample (men and women 45–69 years) was selected from population registers in 6 towns in the Czech Republic. The data were collected as a part of the HAPIEE (Health and Psychosocial Factors in Eastern Europe) study, an international project based in 4 post-communist countries of CEE; and is available for 4488 people for Grip strength and Chair and for 3004 individuals aged 60+ for Walk speed. Range of covariates (education, material circumstances, health behaviours,
and psychosocial factors) were also collected. The association between socioeconomic and physical functioning indicators as well as age decline were evaluated by regression modelling. All 3 indicators of physical functioning were associated, after controlling for age and town and other covariates, with education and material circumstances. The study results suggest stronger educational than material circumstances gradient (especially in women). Our study showed that more educated individuals (both men and women) had particularly higher values of Grip strength. In terms of ageing, Chair rise decline was much steeper in those with lower education in both men and women, however, the statistically significant decline in performance associated with material circumstances was found only in men. This study provides the evidence for social inequalities and ageing decline in physical functioning in large CEE population.

**IT AND GAMES HEALTH: EXERGAMES AND E-HEALTH**

**Computer game dance training-induced effect on attention networks of elderly**

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**Introduction:** It is suggested that one of the reasons for the lack of effect in fall prevention programs is insufficient attention given to cognitive functions in interventions [1]. Dual task costs of gait are associated with attention [2] and with walking while visually observing [3]. It can be assumed that interventions should, thus, focus on combinations of physical activity, attention, and visual observation. Action video game play of children improves attention resources and allows better allocating attention across space and time [4]. This study evaluated whether computer game dance training is able to improve attention networks in elderly. **Methods:** Twenty elderly [17M/3F, 74.4± 6.6 [range 63-85] yrs] naive to computer games danced 24 sessions performing six-to-nine dances during 10 weeks. The Attention Network Test (ANT), a neurocognitive test providing separate measures for the alerting network, the orienting network, and the executive control network of visual attention, was recorded pre- and post-training. **Results:** Eighteen individuals [16M/2F] adhered to 24 scheduled trainings. Paired t-tests showed significant improvements in the executive control network: reaction time in ms pre/post = 113.2/79.4, t(17) 2.437, p = .026, r = .51. No improvements were seen in alerting [ms pre/post = 44.5/52.9 t(17) -.708, p = .488, r = .17] and orienting networks [ms pre/post = 11.5/22.1, t(17) -.52, p = .147, r = .35]. **Conclusions:** The findings provide support for the proposition that computer game dancing affects dual task costs of walking related brain function; e.g. the executive control network [1]. This study encourages the further development of this intervention. **References:** [1]. Herman et al. Journal of Gerontology: Medical Sciences 2010; [2]. de Bruin & Schmidt. Behav Brain Funct. 6:59, 2010; [3]. Bock. Journal of NeuroEngineering and Rehabilitation 2008, 5:27; [4]. Dye et al. Neuropsychologia 47(8-9), 2009. **Keywords:** Technology; Games; Dancing; Attention; Networks.

**Gaming for health: A systematic review of the physical and cognitive effects of interactive computer games (ICG) in older adults**

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Background: Few older adults engage sufficiently in Physical Activity (PA). Developing methods to overcome barriers to PA and promote adherence is an increasing challenge for public health. Interactive computer games (ICG) are increasingly used to promote PA and rehabilitation. This systematic review examined the physical and cognitive effects of using ICG in older adults. Methods: Computerized literature searching, citation tracking, and hand searching were carried out up to June 2011. Eligible studies were trials involving older adults (>65 yrs) describing the effects of ICG on physical or cognitive outcomes. Secondary outcomes included adverse effects, compliance, and enjoyment. Two authors independently selected trials for inclusion. Disagreement between authors was resolved by consensus, or third party adjudication. Effect sizes were calculated using RevMan software. Results: Thirteen trials met the inclusion criteria, of which three used participants with a mean age of >80 years. Meta-analyses were not undertaken due to study heterogeneity. The majority of participants were living in the community, senior living or retirement centres. ICG interventions varied in terms of software, game type, and nature of computer interaction; the majority incorporated postural stability training. In two studies, the primary focus was to challenge aspects of cognitive functioning. There were trends from both observational and randomised controlled studies that ICG improves postural stability. A small number of studies also reported positive changes in muscle strength and cognitive function. No major adverse effects were reported and two studies found a small number of minor events. Conclusion: There is preliminary evidence that ICG is a safe and effective form of exercise for older adults. ICG could be improved further by tailoring interventions for older adults; this should include optimising participant safety, motivation, and enjoyment for this population. Keywords: Physical Activity, Games; Technology; Cognition; Postural Stability.

Exergames as a practical implementation for nursing home residents in order to enhance self-efficacy and self-concept

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The purpose of the practical implementation is to evaluate whether exergames can be applied in nursing homes and to declare why they could be helpful for a positive self-concept and self-efficacy. The demographic trend results in a greater number of people in need of care. For these nursing home residents the measures of activity are unfortunately mostly limited to only singing, gaming or deficit-orientated fall prevention or gymnastics programs. In the last years the trend of serious games involving whole-body movements has finally reached the nursing homes, but focused mainly still on the aspect of entertainment. These so-called exergames reduce the complexity of the actual sport into a digital situation, achieving a challenging game flow, by using a simplified type of control system. This can be positive for senior people with limited mobility that arises by the reason of miscellaneous multimorbidity. It gives them the opportunity to join in familiar activities, which they otherwise couldn’t deal with due to their limitations. Exergames could be a potential source of self-concept because they offer the possibility to experience self-evaluation, direct and indirect feedback, and social comparison. Furthermore, they allow conclusions on self-efficacy by its sources experienced effort and achievements, social persuasions and vicarious experiences. Self-concept and self-efficacy could contribute to better functional health, which would in turn lead to more successful coping with daily activities, and therefore achieving a better quality of life. Sports and activities such as cycling, hula-hoop and bowls are well
known and practical for nursing-home residents, even wheelchair-users can be included. In order to evaluate the practical implementation, it’ll be evaluated in a qualitative way, using problem-focused interviews combined with quantitative methods like the motor self-efficacy inventory and the self-concept questionnaire in a pre-/post-test design. Keywords: Exergames; Nursing Homes; Technology; Quality of Life.

Aging and the quantified self: Technology, adherence and physical activity

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The ‘Quantified Self’ approach refers to the trend among adults to monitor and share their behaviors, thoughts, and moods using a variety of technologies. An increasing number of middle-aged and older adults are actively engaged in such monitoring, and the numbers are expected to increase. Wolf (2011) lists three reasons people track themselves: to establish a baseline against which to assess future behavior change, to monitor progress toward a specific goal, and to satisfy curiosity and maintain self-awareness. One broad class of methods which enables people to monitor themselves is known as Experience Sampling Methods / Ecological Momentary Analysis. Using empirical data from projects in the Patrick Healthy Aging Lab at West Virginia University (USA), this paper illustrates middle-aged and older adults’ physical activity behaviors using experience sampling approaches. These studies share a similar protocol in which adults monitored behaviors up to five times a day for 6 to 10 days using palmtop computers. Among two samples of older adults (Steele, N = 42, M age = 71 yrs; Stahl & Patrick, N = 10, M age = 64 yrs), issues of accuracy and adherence to the activity regimen are examined. In a sample of middle-aged adults (Goedereis, N = 35, M age = 49 yrs), progress toward weight-loss goals are examined. All three studies contribute to our understanding of how self-monitoring may lead to behaviour changes. Keywords: Technology; Adherence; Physical Activity; Self-Monitoring.

3rD Life 3D virtual environment for social interaction of elderly people

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3rD LIFE is a project funded by the AAL Joint Programme with the main aim to promote the active aging conceptualized as the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age (WHO, 2002). Active aging will be altered by the development of a tool consisting of a 3D virtual environment, especially adapted to ageing people. With only a computer and an internet connection, it will be possible to communicate with other users, make audio and video calls and have a more joyful and active life thanks to e-learning tools, cognitive games and other applications. 3rD LIFE will improve active ageing since: Will increase older people’s interactions with friends, family and the establishment of new contacts with other persons, old and young. This aspect is especially important for preventing loneliness and favoring opportunities to extend the social network and social support; Will assure that the users remain cognitively active as it promotes education and learning opportunities, which is a psychological factor related to active aging; Will allow the users to take part in the development of the tool since 3rD LIFE follows a User Centered Design approach. This implies taking into account users’ wishes,
needs, and specifications regarding the tool and the virtual system. They will decide not only the appearance of the tool but the applications and the way in which they will interact with the tool. This aspect is a factor that enhances the social participation of the old people and allows them to participate in some way in the technological development; will encourage the users to take part in their social context in a more active way. 3rD LIFE will allow the users to find the social events that are taking place in their cities and will give them the possibility to assist via Internet. 3rD LIFE will increase the interaction between older people and new technologies and will promote an active ageing. **Keywords:** Virtual Environment; Technology; Quality of Life; Cognitive Games; Active Ageing.

**E-Diet services and nutraceuticals for an active and successful ageing, contrasting risk factor in EU population: Ristomed trial**

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In literature, some of the main factors defining the quality of aging are related to the inflammatory status (IS), oxidative stress (OX) and gut microbiota (GM) alterations. These elements may increase prevalence of age-related anorexia associated to a reduction of food intakes and a decrease of physical activity too. RISTOMED held under the EU-7FP, aimed at the evaluation of the effects on IS-OX-GM in the presence of an (e)-diet in an Elderly Population (65-80yrs). The study was aimed to compare a e-diet elaborated with a new web platform, alone or implemented by 3 different nutraceutic components: Argan oil, probiotic VSL#3 and the AISA 5203-L extract. In order to evaluate the effects of the intervention, the following measurements and questionnaires have been considered within the protocol: Anthropometric data, handgrip, and Short Physical Performance Battery (SPPB), International Physical Activity Questionnaires (IPAQ), SF-36v2(PCS-MCS), Food Frequency Questionnaire (FFQ), among others. All the data and the results of this panel of questionnaires in Bordeaux, Berlin and Rome showed that in all the 4 arms of the 139 men and women enrolled there was an improvement in terms of quality of life. In a cluster of 44 subjects characterized by a low-grade inflammation with higher levels of CRP, ESR, fibrinogen, IL-6 and TNF-a, the e-diet induced a decrease of CRP in the group with the higher inflammation values, whereby AISA 5203-L amplified this protective effect. The e-diet alone decreased the oxidative stress with no further effect of the products. Cholesterol, triglycerides and glucose parameters were also improved by e-diet with a further effect of Argan oil was associated with a progress of these parameters when they were altered at the baseline. VSL#3 decreased homocysteine level, a vascular risk factor. On the basis of the results an improvement of mood was observed in all groups and an improvement of mental component SF36 was observed following the diet and the diet implemented by AISA 5203-L. **Keywords:** E-Diet; Physical Activity; Nutraceutical; Quality of Life.

**NANA: A holistic approach to assessing nutrition, cognition, mood, and physical activity**

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NANA is a three-year research project funded by the ESRC through the New Dynamics of Ageing programme to develop novel technology to improve data collection from older adults about nutritional status and integrate this with current information about physical function, cognitive function, and mood. The aim is to identify individuals at risk of under-nourishment and frailty and improve targeting of interventions by taking a holistic view of the person and the context in which they live. This multi-disciplinary program brings together skills and expertise in Psychology, Nutrition, and Engineering and Human Computer interaction to improve measurement tools across nutrition, cognition, physical and mental health and increase understanding of the way these domains interact. Forty older adults aged between 65 and 88 (mean age 72.3) participated in the NANA toolkit validation between July and November 2011. The NANA data are being validated against gold standard measures in nutrition, cognition, mood, and physical activity and preliminary analysis suggests that the NANA data are satisfactory. Once the validation is complete it is hoped that the NANA toolkit will be useful for informing strategies to prevent physical and mental decline in ageing and improve medical treatment and social provision for older people. NANA also has potential for commercial development primarily for use with older people but also for use with other groups in the population that would benefit from comprehensive holistic assessment.

**Keywords:** Technology; Nutrition; Physical Function; Cognitive Function; Intervention.

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**Increasing mobility in older adults: Early findings from the ‘Devices for Assisted Living’ Europe-wide project**

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The number of over 65s in the European Union (EU) is predicted to almost double by 2060. Those over 80 will be almost triple 2008 figures (European Commission, 2009). Mobility per se, but particularly physical activity, is related to independent living, wellbeing and reduced mortality (Mänty et al., 2007). Shopping is a useful way for individuals to stay mobile. It encourages physical activity and reduces social isolation (Kim, Kang, & Kim, 2005). However increased risk (and experience) of falls, and reduced muscle control can result in older adults feeling less confident in their ability to go out independently especially in unfamiliar and crowded spaces. In the EU-funded DALi (Devices for Assisted Living) project, we pursue autonomous mobility through the development of the ‘c-walker’. This mobility aid supports navigation in crowded and unstructured spaces. The device will anticipate the intent of the individual and determine the path that poses minimal risk of accident. The c-walker will recommend a course of action to the user through visual, acoustic, and/or haptic interfaces. As this is an assistive technology, the user remains in charge of ultimate decision making. The expected benefits include reducing the anxiety of navigating such environments, increased likelihood of continued autonomous use of such environments, and increased or maintained personal independence. In this paper we present the initial requirements gathering research. Utilising a mixed methods approach (naturalistic observations, focus groups, interviews, surveys and experimentation) we discuss how older users engage with the shopping environment, the perceived benefits of shopping and, more generally, thought, cognition and decision making processes during shared space navigation.

**References:** European Commission, 2009 Ageing Report; Kim, Kang & Kim (2005) Psychology and Marketing, 22, 995-1015; Mänty,
Heinonen & Leinonen et al. (2007) Arch Phys Med & Rehab, 88, 1108-111. *Keywords:* Mortality; Physical Activity; Independence; Mobility; Cognition.

**OBJECTIVE PHYSICAL ACTIVITY MEASUREMENT IN OLDER PEOPLE**

Invited lecture: Can we quantify behaviour of the older adult from the analysis of free-living activities?

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The quantification of free-living physical activities (PA) is important in understanding how physical activity and sedentary behaviour impact on health and how interventions might modify free-living behaviour to enhance health. Quantification, and the terminology used, has often been determined by the choice of measurement technique. Many systems use cumulated acceleration over fixed epochs resulting in outcomes of counts can be difficult to interpret. A terminology and a systematic approach for the analysis of free-living activity information based on event-based activity data using a flexible hierarchical classification of events were developed. In the older adult population, we have used this approach to understand differences in sub-populations that illuminate fundamental differences in the way in which both sedentary and upright time are accumulated. Here, although there were volumetric differences in the data, there was also a fundamental difference in the pattern of these events providing evidence of differences in behaviour. It is proposed that by understanding this behaviour we can better target PA guidelines to the older adult population and also, in this population, we can produce more relevant outcome measures to understand the effectiveness of interventions.

Invited lecture: Assessing physical activity in daily life, can we add quality to quantity?

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In the last decennia, a number of approaches have been developed for assessing quantitative aspects of physical activity (PA) in daily life. For example; step counts, activity counts, frequency and durations of specific postures and activities. Such methods have now been applied in many studies aiming to assess PA levels in different populations. With recent advances in wearable technology, such as new hybrid motion sensors and new algorithms, it is possible to also assess spatiotemporal parameters of postures and activities, and hence assess quantitative as well as qualitative parameters. This contribution will present and discuss examples of such combined assessments of mobility in older people by focusing on gait and sit-to-stand performance in daily life.

**Total daily physical activity and health benefits in older adults**

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Few studies have examined objective measures of physical activity in older adults or the contribution of non-exercise physical activity and health benefits in old age. We tested the hypothesis that an objective measure of total daily activity, including both exercise and non-exercise physical activity, is associated with decreased risk of death, Alzheimer’s disease and
disability in community-dwelling older persons. We used clinical data from more than 850 participants of the Memory and Aging Project, a longitudinal cohort study of aging. Total daily physical activity (exercise and non-exercise physical activity) was measured at baseline for up to 10 days with ActiGraphs (Actical®; Philips Healthcare, Bend, OR) worn on the wrist 24 hours/day for up to 10 days, providing an objective measure of total daily physical activity which circumvents recall bias. In a Cox proportional hazards models adjusting for age, sex and education, a higher level of total daily physical activity was associated with a decreased risk of death (hazard ratio = 0.71; 95% CI:0.63,0.79); disability (HR = 0.75, 95%CI 0.66, 0.84) and Alzheimer’s disease (HR = 0.48; 95% CI:0.27,0.83). These results were unchanged after controlling for self-report physical activity and chronic health conditions. These data support a link between a more active lifestyle with survival and well-being in old age. Thus, older persons may benefit not only from various exercise regimens, but may also accrue health benefits from a much wider spectrum of non-exercise, movement-based activities including habitual daily physical activity, leisure-time physical and social activities. Funding: The study was supported by NIA grants R01AG17917 and R01AG24480. Keywords: Alzheimer’s; Physical Activity; Health; Social Activities; Benefits.

Association of actual physical activity and affective states in older people: An interactive ambulatory assessment study

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Physical activity influences affective states. However, this association was rarely studied in ongoing real-life situations. Also, the impact of motivational states in situ has hardly been analyzed. The degree to which active episodes are regulated autonomously might moderate the effect of physical activity. Using an interactive ambulatory assessment approach, we assessed autonomous regulation mode (AR), affective states, and actual physical activity (aPA) during every day life situations in older people. The assessment interactively linked event based assessments of AR and affective states to certain episodes of aPA. These episodes were detected by a 3-axial accelerometer. In a randomized sample of 22 woman and 21 men (Mage = 61; SD = 6.5) we assessed aPA in daily life situations continuously over three consecutive days (Thursday to Saturday). The accelerometer gave an acoustic signal when predefined intensity thresholds were surpassed. This signal prompted the subjects to complete an electronic diary in order to assess AR and the basic dimensions of affective states. We assessed AR with four questions (Reis & Sheldon, 1999). A six-item mood scale (Wilhelm & Schoebi, 2007) was used to measure mood. We controlled for the general psychological need for autonomy (Gagné, 2003) and the volume of physical activity via cross level interaction. Both aPA and AR significantly influenced affective states in real life situations. The interaction was significant for valence and energetic arousal. The higher the volume of physical activity episodes and the more these situations were autonomously regulated, the more our participants felt well (t (841) = 2.1, p = .037) and energized (t (841) = 3.5, p = .001). The significant interactions underline that the impact of aPA in everyday life on affective states is moderated by the degree to which such activity episodes are regulated autonomously. Keywords: Physical Activity; Accelerometer; Ambulatory Assessment.

Invited lecture: Relevance of monitoring physical activity in daily life

de Bruin, Eling

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At present, many different approaches exist to monitoring aspects of physical activity (PA) based on the use of on-body motion sensors. The extent to which these new methods actually contribute to furthering physical functioning as well as promoting an active lifestyle in older people is somewhat unclear, since the current literature does not yet present an abundance of evidence-based studies which underline clinical relevance of monitoring PA. This contribution will critically address existing possibilities and future potential of monitoring methods.

**UK STROKE AND EXERCISE FORUM**

**Exercise for Stroke survivors: A synthesis of evidence-based guidelines**

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**Background:** Exercise programmes for stroke survivors are recommended in clinical guidelines. However, comprehensive descriptions of what these interventions include are often lacking. **Aims:** To undertake a structured synthesis of evidence-based guidelines describing key components of exercise programmes for stroke survivors to aid planning, evaluation and replication. **Method:** Fifteen international stroke guidelines were identified. Recommendations relating to exercise after stroke were synthesised using the framework provided by the International Classification of Functioning, Disability and Health (ICF), which enabled their coverage of key domains to be assessed. **Results:** Our synthesis provides a comprehensive inventory of key components of exercise programmes after stroke. These include the frequency, duration and type of exercises, support mechanisms, setting, and delivery. Most exercise recommendations relate to the ‘Body Structures’ and ‘Functions and Activity’ domains of the ICF framework. Few guidelines explicitly address the ‘Participation’ domain, which concerns work, leisure, social and family roles. ‘Environmental’ and ‘Personal Factors’ are addressed through a number of recommendations relating to programme structure and delivery. Whilst all/most guidelines advocate the promotion of lifelong commitment to physical exercise, few provide few recommendations about how to achieve this. Greater specification of recommended behaviour change techniques and delivery modes is achieved by this review. **Conclusions:** This synthesis provides a framework that, according to the type of exercise programme that is required, can support the planning and evaluation of exercise programmes after stroke. Evidence on key aspects of programmes is often lacking and, therefore, more detailed recommendations should be provided in future guidelines. **Keywords:** Exercise Programmes, Stroke; Natural and Built Environment; Guidelines.

**Exercise and fitness intervention after stroke (EfS)**

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**Objectives:** To explore the feasibility of incorporating an EfS pathway into the existing Clinical Referral for Physical Activity programme in Camden, guided by the evidence base established in the STARTER trial (Mead, et al. 2007). **Design:** Mixed cardiovascular endurance and muscular strength training circuit based on STARTER Trial. **Setting:** Physiotherapy gym at St Pancras Hospital. Once a week for 1 hour for 12 weeks, taught by 2 NVQ level 4 EfS instructors. **Participants:** Originally 10 independently ambulatory patients were referred from Joint Therapy and Stroke REDS Teams; 6 male and 4 female; Age range (36 – 82yrs); 3
did not start due to transport issues and other commitments; 1 dropped out due to ill health; 6 completed the study; All had suffered Partial Anterior Circulation Stroke within the last 3 years; 8 had right sided Middle Cerebral Artery infarcts and 2 patients had left sided. The inclusion and exclusion criteria are as set out by the Camden Active Health Team and NHS partnership. **Outcome measures:** Timed Up and Go (TUAG) and 10m walk at baseline (1) then at 12 weeks (2). Patients had 2 attempts at each measure and the average recorded. **Results:** Average attendance 9 sessions out of 12. Average percentage improvement TUAG = 25.76% (Range 9.57 – 53.16%). Average percentage improvement 10m walk = 18.74% (Range 2.24 -33.89%). Raw data is available on request. **Discussion:** In keeping with the findings of Mead, et al. 2007, our results show that all participants made significant improvements and suggest that targeted exercise for Strokes should be included as an integral part of a referral programme. **Conclusion:** All participants that took part made significant improvements in both TUAG and 10m walk. One participant improved his TUAG by over 50% -he is able to now walk faster without his walking stick than he did before the trial with his walking stick. **Keywords:** Exercise Programmes, Stroke; Guidelines; Walking; Intervention.

**DELIVERY AND ADHERENCE TO GUIDELINES**

An evaluation of instructor fidelity in an evidence-based community-delivered exercise program in older adults with arthritis

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**Introduction:** Enhance Fitness® (EF) is an evidence-based, community-delivered exercise program with fidelity guidelines, however, observer-rated fidelity of instructors to its core components has not been reported. This study evaluated EF instructor fidelity during a 12-week intervention in older adults with arthritis. **Methods:** There were 323 participants and 10 instructors at 16 community sites. A trained observer visited 1 class per instructor at baseline and 12 weeks to complete an EF fidelity checklist. The checklist rated (pass, needs improvement, fail) the physical setup; instruction safety; and duration, intensity, music, verbal cueing, and content of each core component (warm-up, aerobics, cool-down, strengthening, balance, stretching). **Results:** Instructors were 30 to 69 years old with varying experience (4 experienced, 4 intermediate, 2 beginners). At baseline, pass-needs improvement-fail rates for physical setup and instruction safety were 91%- 9%-0% and 93%-7%-0%, respectively. Items needing improvement were mostly due to physical environment constraints (e.g., noisy, busy, hot). Across core areas, ratings were: pass, 64% to 89%; needs improvement, 0% to 18%; and fail, 0% to 33%. Common errors were performing a too intense warm-up, too few balance exercises, and beginning weights sooner than recommended by EF. Several instructors required coaching to perform exercises correctly. One instructor was resent for EF training. At 12 weeks, physical setup and instruction safety rates improved to 92%-8%-0% and 100%-0%-0%, respectively. Core areas also improved to: pass, 88% to 100%; needs improvement, 5% to 10%; and fails, 0% to 5%. **Conclusion:** Although fidelity was good, undergoing standardized instructor training was not enough to ensure that EF was implemented as intended. The addition of class observations may have improved fidelity over time. Programs planning classes may wish to budget for observational visits and instructor retraining session. **Keywords:** Fidelity; Instructors; Arthritis; Safety; Exercise Programme.

**Effects of a hydrotherapy program on flexibility and muscular strength in elderly men**

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Introduction: Hydrotherapy is used to treat rheumatic, orthopedic, and neurological disorders. It has been the subject of investigations regarding balance recovery in elderly people. Aim to evaluate the effect of a hydrotherapy program on flexibility and muscle strength among sedentary elderly men. Method: The participants were 28 healthy sedentary elderly men aged between 64 and 84 years (14 in the experimental group and 14 in the control group). Muscle strength before and after the program was assessed by means test 30-Second Chair stand and Flexibility assessed by means chair sit-and-reach test (Rikli & Jones 2001) . The program consisted of 36 one-hour sessions over a consecutive 12-week period. The physical exercises were organized in seven levels of difficulty that were selected to obtain gains in flexibility and muscle strength. Therefore, there was between and within group analysis using independent t-test (Caromano & Candeloro 2007). Results: Hydrotherapy promoted significant increases in the elderly men’s muscle strength, as assessed using the test 30-Second Chair stand (p < 0.001) and the chair sit-and-reach test (p < 0.001). Discussion: This was similar to the results obtained by many other authors (Chu et al 2004; Caromano & Candeloro 2007) in which the application of a hydrotherapy program increased balance among elderly people. The proposed hydrotherapy program was efficient in improving flexibility and partially effective in improving muscle strength among the early elderly women who took part in the study. Our results are compatible with the findings from similar studies carried out on the ground. Keywords: Hydrotherapy; Muscle Strength; Flexibility; Sedentary.


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Introduction: Chronic musculoskeletal pain (CMP) is common amongst older adults. There is a lack of consensus on the relationship between CMP and physical activity in older adults. Aims: The aim of this study was to investigate the relationship between CMP and adherence to physical activity guidelines. Methods: Data were obtained from the Health Survey for England (2008), a cross-sectional survey of a random sample of people living in England. Only respondents who were 60 years of age were included in this study (N = 4770 [males 2128], age 71 (±8) [mean (±SD)]). Chi-square analysis was used to investigate if there was a difference in physical activity guidelines adherence between those with and without CMP. Binary logistic regression was then carried out with physical activity guideline adherence [yes, no] as the independent variable and CMP presence [yes, no] as the dependent variable with age, gender, BMI, smoking status, alcohol intake, and diet variables entered as covariates. Results: Out of 4770 older adults, 30% (1,367) of respondents had CMP whilst 18% (814) adhered to current physical activity guidelines. There was a poorer adherence to physical activity guidelines in those with chronic pain compared to their non-pain counterparts (21% vs. 10%, χ2 = 92, p < 0.001). Individuals with CMP were only half as likely to adhere to current physical activity guidelines (Odds Ratio [95%CI] = 0.50 [0.40 to 0.63]). Discussion: Older adults with CMP have a reduced adherence to physical activity guidelines compared to those without CMP. These findings agree with surveys of older adults in North America and younger adults in the UK. These results highlight CMP as a barrier to physical activity in older adults. The fact that physical activity is the cornerstone of treatment for CMP
emphasises the importance of these findings and the need for strategies specifically designed to increase activity in this under researched population. **Keywords:** Musculoskeletal; Pain; Physical Activity; Guidelines.

Sirsasana (headstand) technique alters head/neck loading: Considerations for safety  
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Headstand, the sirsasana, of all yoga poses, requires practitioners to support the full body with the forearms and crown of the head. A goal of novice and expert practitioners alike, sirsasana performance technique significantly modifies head and neck loads. This study examined the weight-bearing responsibility of the head and neck (separate from the arms) at moments of peak force during entry, stability, and exit of three typical performance methods. The three methods were: symmetrical extended leg (SE), symmetrical flexed leg (SF), and asymmetrical flexed leg (AF). Three groups of 12 participants each (1 male, 11 females) were formed, each group performing one technique. All 36 subjects (18-60 years of age) reported an active yoga practice including sirsasana with no record of cervical injury. After a 10 min warm up, participants performed three headstands. Volunteers were spotted but not supported as they held the pose for five self-paced breaths followed by 2 min of rest between poses. Kinematic and kinetic Vicon data was analyzed to locate peak forces acting on the head, center of pressure, and neck angle at C3 in the frontal plane. Force plate data revealed flexed leg techniques produced the greatest forces during entry and nominal forces on exit, whereas SE produced larger forces that increased upon exit. Kinematic data revealed that AF showed greatest deviations from midline in the sagittal plane and SE showed the least. In the frontal plane, neck angle about C3 tended towards extension in SE and flexion in SF and AF. Previous research has shown asymmetrical loading to increase potential damage to the cervical spine especially in the middle-aged population. As that population is heavily represented in yoga studios, the data support the conclusion that SF is preferred as AF exhibited increased lateral variation and SE exhibited the largest sustained loads. Entering the posture with symmetrical flexed legs appears to reduce mechanical risks of headstand. **Keywords:** Yoga; Head/Neck; Safety; Cervical Spine.

Preliminary investigation into gait characteristics and jump performance in older adults  
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**Background:** The aim of a jump is to displace the body’s centre of mass in a vertical direction. A common and ecologically valid movement involving a high degree of muscular power, joint coordination, tendon elasticity, and neuromuscular parameters. Therefore, it may be ideal to assess the age-associated decline of the musculoskeletal system. **Aim:** In this study, we compare walking temporal-spatial parameters (TS) with jump performance in older adults. **Methods:** Movements were recorded using a Vicon 9-camera system synchronised with Kistler force plates. The participants were adult women, age >60 years, classified according to frailty measures. Gait was freely selected along a 10m walkway. TS parameters combined left and right strides beginning with force plate contact. The total jump height was the difference of the heights of the COM at take-off (TO) to maximum. The start of countermovement (CM) was the point where there was a fall of 3mm in COM from standing height. The end of the CM was where the COM began to rise, corresponding to the start TO.
The instant when vertical force < 10N marked end TO. Jump time is from the start of CM to TO. **Results:** Gait TS parameters are slower in frail compared to non-frail: cadence 89 v 113 steps/min; speed 0.65 v 1.51 m/s; stride length 0.87 v 1.59 m. Total jump time is similar between frail and non-frail (0.69 vs 0.71 s). There was less time in the CM phase in the frail (55 v 61% of total). While overall jump height (2.57 v 11.3 cm) and power achieved (1.686 v 1.987 N/BW) are quite different in frail v non-frail. **Discussion:** Jump height and peak jump force are measures reflecting musculoskeletal components of which power is vital. These findings are in agreement with the suggestion that lower extremity muscle power is a good predictor of mobility performance in older adults. **Keywords:** Walking; Gait; Jump Force; Musculoskeletal; Mobility Performance.

**Functional exercise improves mobility performance in older adults with diabetes**

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Mobility impairment is an important but under-recognized complication of Type 2 diabetes mellitus (T2DM) in older adults. We conducted a randomized controlled trial to determine the effectiveness of a practical, community-based, combined group and home-based exercise intervention in sedentary older adults with T2DM. **Methods:** Ninety-three adults aged 60 to 85 with T2DM were computer-allocated into Intervention (I, n = 57) or Control (C, n = 36) groups in order to minimize differences in age, gender, and functional status (EPESE, a battery of self-reported ADL and mobility items). The intervention consisted of 10 weeks of group functional circuit training with mixed aerobic and resistance components followed by 10 weeks of a tailored, behaviourally supported home exercise with a focus on physical activity enhancement. Controls underwent a 10-week group flexibility and toning class followed by 10 weeks of relevant health education. Outcomes were timed get up and go (TUG), speed (CGS), and six min walk distance (6MWD).

**Results:** Groups (C vs I) did not differ significantly in key demographic or baseline measures (mean or %): age both 71 yrs; female 53 vs 64%; BMI 34 vs 33; HgbA1C both 7; TUG both 9 s; CGS both 1.2 m/s; and 6MWD 1293 vs 1337 ft. Attrition did not differ between the groups (20% I and 19% C did not complete 20 week testing). Using multivariate, intent to treat analyses and controlling for age, gender, BMI, and functional status, significant improvements for I versus C were demonstrated at 20 weeks for CGS (p < .03) and 6MWD (p < .04) but not for TUG. The model estimate for improvement for CGS was .11 m/s and for 6MWD was 94 feet, both considered at least small clinically meaningful improvements based on Perera 2006 (CGS .05 m/s, 6MWD 20m). **Conclusion:** On-site plus home-based exercise improves mobility performance in older adults with type 2 diabetes. Future studies must test whether this improvement can be sustained over a longer period of time. **Keywords:** Diabetes; Mobility; Intervention; Home Exercise; Sedentary

**SEDENTARY BEHAVIOUR AND OLDER PEOPLE**

**Sedentary behaviour in older adults: A systematic review**

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**Background:** There are published review articles addressing the current state of knowledge regarding sedentary behaviour in children, adolescent and adults, but there are no review-
level data for older adults. **Objectives:** To collect and appraise the current literature on the prevalence and correlates of sedentary behaviour among older adults. **Methods:** Studies published in English up to and including December 2011 were located from computerised and manual searches. Observational or baseline data from intervention studies that included a sample of older adults with a mean age of >50 years, and that reported on the prevalence and/or correlates of time spent in at least one sedentary behaviour, were included. **Results:** 16 studies including 29 samples were included. Most studies (n = 15) were cross-sectional, one included a retrospective study design. Sedentary behaviour was primarily measured as TV viewing (n = 9) followed by multiple assessments of sitting, including reading, socialising, and total sitting time. Only one study included an objective measure of total sedentary time, with the remaining studies utilising self-report measures. All 16 studies included data on prevalence of one or more sedentary behaviours. Prevalence of television viewing >2h/day ranged from 39.6% to 67.1%. Prevalence of sitting during leisure time varied greatly depending on the type of activity and the categorisation of time. In the one study including objective assessment of total sedentary time, prevalence of > 9 hours sedentary time per day was 66.7%. Associations were evident for correlates of age, gender, education, employment, BMI, leisure-time physical activity with sedentary behaviour (mostly defined as television viewing). **Conclusion:** Prevalence of sedentary behaviour in older adults is high. Correlates of sedentary time appear to be largely socio-demographic. Further work is required on how sedentary behaviour can be changed in this important population. **Keywords:** Sedentary Behaviour; Socio-Demographic; Television Viewing; Motivation and Behaviour Change.

**Sedentary behaviour and physical activity are independent predictors of successful aging in middle-aged and older adults**

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Sedentary behaviour is emerging as an independent risk factor for health and well-being. Unfortunately, little data exist on the association between sedentary behaviour and successful aging (SA) despite evidence that physical activity is strongly correlated with each of the components of SA. **Objective:** To determine whether there is an association between sedentary behaviour (hours spent sitting/day) and SA, independent of physical activity (number of hours walked/week) using the Canadian Community Health Survey. **Methods:** SA variables were created for all three components of SA (physical, psychological and sociological) based on the model proposed by Rowe and Kahn. Multivariate logistic regressions controlling for age, marital status and income were conducted for each SA outcome with both physical activity and sedentary behaviour as main exposure variables. **Results:** Among older adults (n = 9,478), those who were moderately (2-4 hours/day) and least sedentary (<2 hours/day) were 38% (OR: 1.38; CI: 1.12-1.69) and 43% (OR:1.43; CI: 1.23-1.67) more likely to age successfully compared to those who were sedentary (4 hours or more/day). Among middle-aged adults (n = 10,060), compared to those who were sedentary, those who were least sedentary were 43% (OR:1.43; CI: 1.25-1.63) more likely to age successfully. For the physical component of SA, a dose-response relationship was evident such that those who were least sedentary had greater odds of aging successfully than those who were moderately sedentary when compared to those who were classified as sedentary. For the psychological and sociological domains, being sedentary for less than two hours seemed to be the minimum required dose for SA. **Conclusions:** Engaging in sedentary activities is significantly associated with lower odds of aging successfully among middle-aged and older adults in Canada. Furthermore, a
dose-dependent relationship between sedentary behaviour and the individual components of SA may exist. **Keywords:** Sedentary Behaviour; Health; Wellbeing; Physical Activity.

**Is long sleep duration “sedentary behaviour” in later life?**

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**Introduction:** Increased all-cause mortality has been associated with longer (8-10 hours+) and (though less consistently) shorter (<5 hours) self-reported sleep durations. While the physiological consequences of chronic sleep disturbance may help to explain excess mortality associated with shorter sleep durations, mortality associated with longer sleep durations remains poorly understood. The present analyses explore the possibility that longer sleep duration in later life impact survival through sedentary lifestyles and ‘inactive’ ageing.

**Methods:** Detailed profiles of sleeping patterns, health, and physical activity were obtained from a random community sample of 1042 older people (aged 65+) interviewed in 1985 for the Nottingham Longitudinal Study of Activity and Ageing. In the 27-year period 1985-2012, the project received notification of 981 deaths. To assess sleep-mortality relationships, baseline sleep durations were categorized <5, 6, 7 (reference), 8, 9 or >9 hrs, and 2 separate Cox survival models were fitted adjusted for: age, sex, social class, and baseline anxiety & depression (Model 1); and as Model 1, plus baseline walking durations (categorized as below: <150 min / week; or above: >150 min/week international guidelines). **Results:** The modal self-reported sleep duration was 7 hours. In Model 1 longer sleep durations (>9 hrs) were significantly associated with mortality (HR = 1.51 (95% CI = 1.10-2.06, p < 0.01). However, in Model 2, adherence to physical activity guidelines, but not longer sleep durations significantly predicted mortality (HR = 0.77 (95% CI = 0.67-0.89, p < 0.01). Shorter sleep durations were not significantly associated with mortality in any of these models. **Conclusion:** Physical inactivity and sedentary behaviour are under-researched confounders in long sleep duration mortality relationships. Survival outcomes indicate that longer sleep durations may compromise survival potential through reduced physical activity. **Keywords:** Mortality; Sedentary Behaviour; Sleep Duration; Physical Activity

**Levels and patterns of daily physical activity and sedentary behaviour measured objectively in older care home residents in the UK**

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**Background:** Physical activity (PA) is important for maintaining independence and improving quality of life in care home residents. Little is known about patterns of PA or sedentary behaviour (SB) in this population. This study aims to characterise these patterns in older adults living in care homes. **Methods:** 21 care home residents (80.4±9.6yrs) wore an ActiGraph GTX-3 accelerometer for 7 days (Monday–Sunday). Acceptable monitor wear time was 10hrs on 5 days, with non-wear time defined as <100mins continuous counts of zero. Time spent in SB, low, light and moderate-to-vigorous PA (MVPA) was recorded according to cut-off points of <100 count/min (cpm), 100-759cpm, 760-2019cpm and 2020cpm, respectively. The number of bouts of SB (>60mins), low and light PA (>10mins) and mean bout length (min) were calculated. Care staff reported activities of daily living (Barthel index; BI) and functional ambulation classification (FAC) for each participant. **Results:** Participants spent on average 79% of their day (10.3hrs) in SB, 14% in low PA (1.8hrs),
6% in light PA (46mins) and 2% in MVPA (12mins). Age, BI and FAC correlated with
time spent in light PA (r = -0.5, 0.53, 0.53 respectively) and MVPA (r = -0.5, 0.45, 0.45
respectively; P < 0.05). Mean daily cpm (163.5±126.4) correlated with age (r = -0.61), BI (r
= 0.57) and FAC (r = 0.5; P < 0.05). Participants averaged 4 bouts of SB/day (2.1 hr/bout).
SB bout length correlated with age (r = 0.48), FAC (r = -0.67) and BI (r = -0.66;P < 0.05),
number of bouts did not. Five participants performed 1 bout of low PA/day (11.8min/bout)
and two performed one bout of light PA twice/week (11.9min/bout). SB and PA levels did
not significantly differ between days or hours of the day (P > 0.05). Conclusion: Levels of
PA were very low and time in SB high. PA and SB both correlated with age and disability.
Few participants performed regular bouts of low or light PA. This study can help inform PA/
SB interventions and guidelines for care homes residents. Keywords: Sedentary Behaviour;
Physical Activity; Quality of Life; Care Homes.

Relationship between physical activity, pain, function and quality of life in older adults
with lumbar spinal stenosis
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Introduction: Performance (physical activity in day-to-day life) has been identified as an
important clinical outcome for older adults with lumbar spinal stenosis (LSS). We have
recently begun to objectively measure performance using accelerometers. Yet, it is not clear
how performance measurements relate to traditional outcomes of pain, function, and quality of
life. Methods: Subjects were >50 with LSS. All subjects wore an activity monitor for 7 days,
completed the Self-Paced Walking Test and a questionnaire including the Oswestry Disability
Index (ODI), Swiss Spinal Stenosis Questionnaire and SF-36. Performance was measured
with activity counts, steps/day and sedentary time (duration of time spent < 100counts/min).
Maximum continuous activity (capacity) was defined as the maximum number of consecutive
min above ‘light intensity’ activity (>100 counts/min). Results: Subjects (n = 19) were
66.7±7.8 years old and 78% were female. Total activity (counts/week) was related only to
male sex (r = 0.54) and steps/day associated only with BMI (r = 0.53) (p < 0.05). Sedentary
time was associated with leg pain (r = 0.72), back pain (r = 0.60) and male sex (r = 0.53) (p
< 0.05). None of the performance variables were correlated significantly with the walking
test, or self-report measures of disability (ODI), or physical function (Swiss Spinal Steno-
sis Questionnaire). Maximum continuous activity was correlated with leg pain (r = 0.52),
BMI (r = 0.47), Emotional (r = 0.49) and Mental Health (r = 0.55) measures. Conclusion:
Performance measures were not significantly correlated with outcomes commonly used to
measure function and disability. This suggests that current outcome tools are not capturing
the construct of performance. Because improvement in physical activity is an important goal
of intervention, performance measurements should be added to future outcome batteries.
Given the strong relationship with pain, sedentary time may become an outcome of choice
when examining physical activity. Keywords: Physical Activity; Performance Measurements;
Sedentary Time; Quality of Life.

PHYSIOLOGICAL AND BIOMECHANICAL EFFECTS OF EXERCISE

Resistance training volume, recovery intervals between sets and repetitions sustain-
ability, in trained older women
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**Introduction:** The effectiveness of resistance training programs depends on several parameters, such as intensity, number of repetitions (NR), volume, frequency, and duration of the recovery intervals (RI). Although the results of studies in young people or those related to upper-limb performance are important to the understanding of the effects of RI on NR, sustainability and volume, such findings may not be applied to either lower-limb or older adults performance, due to changes imposed by the aging process. **Objective:** The aim of this study was to analyze potential effects of RI, between sets, on sustainability of repetitions, NR, and total volume during a lower-limb exercise, in trained older women. **Method:** Twenty-one resistance-trained older women (66.4±4.4 years, 69.1±11.4 kg, 157.2±5.0 cm) performed three sets of repetitions to voluntary exhaustion, with loads that corresponded to 15 maximum repetitions, in two experimental sessions (ranging from 48 to 72 hours apart). In each session, one of two duration of RI (1 or 3 min; RI-1 and RI-3, respectively) was tested, according to a randomized and counterbalanced design. A two-way ANOVA followed by Scheffé’s post-hoc test or Student-t test was used whenever appropriate. **Results:** Significant differences (p < 0.05) found: a) reductions of NR in both RI (RI-1 = 14.0±1.4; 7.8±1.7; 6.8±1.3, and RI-3 = 13.9±1.2; 10.3±1.4; 9.5±1.7 repetitions for the first, second and third sets, respectively); b) RI-3 session presented a higher sustainability (less reduction in NR between sets) and total volume (load in Kg x NR; RI-1 = 2683 ± 631; RI-3 = 3154±656 kg/repetition) compared to the RI-1 session. **Conclusion:** The NR, sustainability of repetitions, and total volume are influenced by the length of the RI between sets, in resistance trained older women. Longer RI should be used when the goal of training is to increase the total volume. **Acknowledgements:** Brazilian Agencies (FAPESP, CNPq, CAPES, FUNDUNESP, PROEX-UNESP). **Keywords:** Resistance Training; Recovery Intervals; Older Women.

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**Effect of concurrent training on body composition and bone mineral density in post-menopausal women**

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**Introduction:** Aging and menopause are independent risk factors for the development of obesity and osteoporosis, and these risks increase when associated with sedentary lifestyle. **Objective:** To investigate the effect of concurrent training on body composition and bone density in postmenopausal women. **Methods:** Sample consisted of 94 postmenopausal women, aged 50-75 (61.4±6.9) years, from Presidente Prudente, Sao Paulo-Brazil. The participants were distributed in three groups: training group(TG): performed only concurrent training during eight weeks, three times/week; training + diet group(TDG): performed the same concurrent training with supervised food ingestion, and control group(CG): did not train or diet. Total fat mass (FM), % of body fat (%BF), fat-free mass (FFM), trunk fat mass (TFM) and bone mineral density(BMD) were estimated by Dual Energy X-ray Absorptiometry (GE Lunar DPX-NT). The intervention period lasted eight weeks, and consisted by the combination of 50-min strength training followed by 30-min aerobic exercise. The training prescription followed the recommendations of the ACSM (2002). The caloric intake followed
the recommendations of the AHA (2000). The comparison between periods, before and after training, was made using the Student’s t test for paired variables. All statistical analysis was performed using SPSS, version 17.0 (p < 0.05). **Results:** The comparisons between both moments, before and after intervention, showed that the TG presented significant decrease in the FM (p = 0.043), %BF (p = 0.010), and improvement in the FFM (p = 0.003). The CG presented significant decrease in the BMD (p = 0.001). No significant differences were observed in the TDG. **Conclusion:** Concurrent training without diet was effective to decrease fat mass and % of body fat, and increase fat-free mass. These results were not observed in the other two groups. **Keywords:** Bone Mineral Density; Postmenopausal Women; Diet; Body Fat.

**The effects of eccentrically biased versus conventional resistance training in older adults**

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Resistance training has established benefits for older people, but the most efficacious mode of training has yet to be determined. We therefore compared the effects of eccentrically biased (ECC) and conventional (CONV) resistance training on strength, muscle architecture, and function in older adults aged 60-75 years. Twelve participants were randomly assigned to CONV, 13 to ECC and 13 to wait-list control. Training was performed twice a week for 16 weeks. Exercises were leg press, toe press, bench press and latissimus pull down. Participants in ECC performed three sets of 10 bilateral lifts at 50% of one repetition maximum (1RM), with the eccentric phase performed unilaterally, alternating between each leg or arm with each repetition. Participants in CONV performed two sets of 10 bilateral lifts at 75% of 1RM. Isometric and concentric knee extensor strength was assessed from 0º/s to 360º/s. Vastus lateralis (VL) and gastrocnemius medialis (GM) muscle architecture were assessed using ultrasonography. Functional capacity was assessed using the: six-metre fast walk (6MFWT), timed up & go (TUG), stair climb and descent, and vertical jump. Compared to the control condition, training increased strength at 60º/s and 120º/s (6-8%; p < 0.05) in both training groups. Isometric strength and strength at fast contraction speeds (240º/s and 360º/s) only increased in ECC (7-11%; p < 0.05). Training improved performance in the 6MFWT in both training groups (5-7%; p < 0.01). TUG and vertical jump performance improved in CONV (5% and 7% respectively; p < 0.01). Stair climb performance improved in ECC (5%; p < 0.01). VL thickness increased (5%; p < 0.05) in ECC. The improvement in strength at fast contraction speeds in ECC means that this modality may be more effective than CONV for improving fast contractions, such as those needed to prevent falls. It is inconclusive as to which modality is more effective at improving function. ECC may be more effective at increasing muscle mass than CONV. **Keywords:** Resistance Training; Strength, Muscle Architecture; Older Adults.

**Six weeks of functional training enhances balance, strength and cardiovascular endurance among postmenopausal women**

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**Introduction:** Resistance training in isolation proved to be effective in enhancing strength in older adults, but their effectiveness respecting balance performance (1) and cardiovascular endurance (2) is unclear. As recent mixed and multicomponent approaches seem to induce more consistent and holistic improvements (3), our purpose was to analyze the effects of
a short-term functional training program on strength, balance, and cardiovascular endurance. **Methods:** A training program mainly consisting of mixed balance-strength exercises, using Swiss balls and elastic tubing, was applied in 12 postmenopausal women (70.69±4.23 yrs), 2 times per week during 6 weeks. Participants performed 6-min Walk test, Up & Go test and Chair-Stand test before and after the training (4). Distance covered in 6MWT, time employed to complete Up & Go test (UGT) and number of repetitions performed in Chair-Stand test (CST) were retained for statistical analysis. After testing for normality (Shapiro-Wilks), nonparametric Wilcoxon test was conducted and Cohen’s d was used to assess the magnitude of the effect. **Results:** The results of the study are presented in Table 1 and Figure 1. A significant moderate to large improvement was found in all the three test following the training program (p < 0.05; d > 0.70). **Conclusions:** The outcomes of the present study demonstrate that 6 weeks of functional training, even if performed only twice a week, are sufficient to enhance lower-limb strength (i.e. CST), dynamic balance (i.e. UGT), and cardiovascular endurance (i.e. 6MWT) among postmenopausal women. A recent study from Hallage et al. (5) reported similar improvements following step aerobics training, but it consisted of 3 sessions a week during 14 weeks. Therefore, current results, despite their preliminary nature, point to a great efficiency of combined balance-strength training programs regarding functional fitness improvement, and suggest them as an alternative to aerobic rhythmic activities (i.e. step). **Keywords:** Postmenopausal Women; Functional Training; Balance; Cardiovascular Strength.

**Effect of progressive resistance training on strength evolution of ageing people living with HIV compared to healthy controls**

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**Objectives:** Human Immunodeficiency Virus (HIV) infection worsens the frailty of elderly people, compromising their quality of life. In this study, we prospectively evaluated eleven living with HIV and 21 controls older than 60 years and without prior regular physical activity, who engaged in a one-year progressive resistance exercise program to compare its effects on muscular strength, physical fitness, and body composition. **Methods:** Exercises for major muscular groups were performed 2 times/week, under professional supervision. Strength increase was evaluated bimonthly, while body composition, lipid and glycaemic profiles (only of those living with HIV), and physical fitness were evaluated before and after the one-year training. **Results:** Those living with HIV were lighter, had smaller Body Mass Index, and were initially much weaker than controls. However, their strength increased more (1.52-2.33 times the baseline values for those living with HIV x 1.21-1.48 times for controls, p < 0.01), nullifying the differences initially seen. These effects were seen independently of gender, age, or baseline physical activity. In addition, those living with HIV improved their fast glucose levels and showed a tendency to improve their lipid profile after the one-year training program. **Conclusions:** Resistance exercise safely increased the strength of older adults living with HIV, allowing them to equal otherwise healthy controls’ performances. These findings favor the recommendation of resistance exercise for elder living with HIV adults. **Keywords:** Resistance Training; HIV; Body Mass Index; Strength Evolution.

**Nordic walking for older adults: Effect on quality of life and functional capacity**

**Kachan, Elisaveta¹; Khavinson, Vladimir¹; Palagnyk, Victor²**
Developing strategies and policies to maintain and increase the level of physical activity among older adults is among vital priorities of the most developed and developing countries. Many of them experience significant negative effects of sedentary lifestyles upon quality of life of the population, functional capacity, and ability to be independent in the later years. Active living is cornerstone of health and quality of life. Although the scientific evidence indicates that regular exercise by older adults can help delay, or prevent, the onset of disabilities and many chronic diseases, reduce the risk of falls and fractures, improve mood and relieve depression, increase mental acuity, and in a way increase life expectancy. However, many older adults are not as physically active as they could and should be. Nordic walking, due to its functionality, safety, and availability for almost everyone, helps to involve elderly people into the process of health maintenance as well as into the social relationships maintenance therefore it can serve as a universal tool for being active. The aim of our study was to examine the benefits of NW for functions of everyday life in older individuals who report sedentary lifestyles. We used functional capacity tests, health questionnaire and modified WHOQOL-BREF to determine whether regular NW exercise increase perceived functional capacity, independence, and quality of life in such individuals. We also studied the reasons to evade physical activity reported by elderly people and whether NW can help to overcome these main reasons to sedentary lifestyles. The study showed that NW is a natural, safe, intensive form of physical activity that can be widely used by older adults as it is cheap and affordable, easy to practice, it allows overcoming main reasons to sedentary lifestyles and is very promising from the point of view of motivation. It increases functional independence and quality of life in older adults. **Keywords:** Nordic Walking; Quality of Life; Functional Independence; Sedentary Lifestyle.

**Kinematics of lower limb segment movement during gait in a healthy population aged 18 to 97 using inertial measurement units**

Monda, Maureen1; Richards, Rosie2; Smith, April-Louise2; Thornton, Matt2; McCarthy, Ian1

1UCL Institute of Orthopaedics and Musculoskeletal Science, UK; 2Royal National Orthopaedic Hospital, UK.

**Introduction:** Walking ability is a key aspect of maintaining independence during ageing; impairment of gait has also been shown to be associated with falls in the elderly. In this study, we have investigated how the kinematics of limb segment movement changes in healthy ageing using inertial measurement units (IMUs), which allow measurements to be performed without use of a standard gait laboratory. **Methods:** Subjects were recruited who were in general good health and active for their age. Participants were excluded if they had had previous surgery on their lower limbs, had a neuromuscular condition that might affect gait (e.g. stroke, Parkinson’s disease), had current back pain, were not able to walk 10 metres without a walking aid, or if they could not give informed consent. The study used four IMUs, with one sensor strapped to each shank and thigh. Participants were then asked to walk for 10 metres at their normal pace. The ranges of motion (ROM) were calculated for thigh, shank, and knee, in addition to the stride duration. Ethical approval for the study was given by UCL Research Ethics Committee, and all participants gave informed consent. **Results:** 113 participants were recruited with an age range from 18 to 97. Results for knee, thigh, and shank ROM showed little change up to the age of 80, but declined noticeably after that age. Stride duration did show a slight linear increase with age, by about 0.1% a year.
**Discussion:** The IMUs were able to provide data on limb segment kinematics in a community setting. In this study of an active population, there was little change in limb segment range of motion until about the age of 80. It is known that peak muscle power declines with age. We propose that after the age of 80, peak muscle power has decreased below a threshold, at which point it has an effect on normal gait and mobility. The work does suggest that in an active healthy population a normal gait pattern can be maintained for many years. *Keywords:* Walking; Gait; Kinematics; Mobility; Inertial Measurement Unit.

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**Practical Workshops**

**DEVELOPMENT AND USE OF CRITERION-REFERENCED FITNESS STANDARDS FOR MAINTAINING PHYSICAL INDEPENDENCE IN LATER YEARS**

Rikli, Roberta

*California State University, Fullerton, United States.*

With the projected increase in the number of older adults throughout much of the world, it is critical for both economic and personal reasons that this large segment of the population remains healthy and independent as long as possible. A key factor in preserving mobility and independence is maintaining the physical capacity (strength, endurance, agility, and balance) needed to do everyday activities—simple housework, climb steps, lift and carry objects, get in and out of a chair or transportation vehicle, and walk far enough to do one’s own shopping and errands. Unfortunately, little is known about the threshold fitness requirements for performing the kinds of activities needed for independent living. This presentation will describe recent research leading to the first-of-their type, fitness standards (criterion reference points) for evaluating physical capacity in older adults relative to that which is needed to remain mobile and independent until late in life. The criterion standards were developed for use with the Senior Fitness Test (SFT), a previously validated and widely used battery of test items that was designed for easy use in the field (non-laboratory) setting. The criterion standards provide an important adjunct to the normative standards already developed for the SFT, based on data collected from over 7,000 older Americans, ages 60-90+. Included will be a discussion of how criterion standards differ from normative standards, how the fitness criterion ‘cut-points’ were developed and validated based on both cross-sectional and longitudinal research, and how the standards can be used to predict physical independence. Most importantly, there will be discussion on how the standards can be used to set ‘fitness goals’ for older adults and to plan interventions that target specific areas of weakness, thus reducing the risk for premature loss of mobility and independence.

**FUNCTIONAL FITNESS EXERCISES FOR OLDER ADULTS**

Brill, Patricia

*Harris County Public Health, United States.*

Functional fitness is a fairly new concept in the realm of exercise for older adults. Functional Fitness is the level of fitness necessary to perform a range of functional movements and activities, thus allowing older adults to adopt a more active lifestyle and improve their quality of life. Functional fitness training also helps older adults perform daily tasks such as driving, gardening, housework, and shopping. The key to functional fitness training is integration. It’s about teaching all the muscles to work together rather than isolating them...
to work independently. Many fitness professionals are faced with the challenge of providing exercise programs for older adults with a multitude of chronic conditions, disabilities, and functional limitations. However, they may not have the training or resources to be able to develop specific exercise programs to meet all of their functional needs. Thus, the purpose of this workshop is to provide participants a better understanding of the benefits of functional fitness exercise in preserving functional capabilities and independence. By the end of the workshop, participants will be able to select and safely conduct the most appropriate functional fitness exercise programs based upon their clients’ goals, needs, limitations, and/or disabilities. Ten different functional fitness programs will be presented throughout the workshop. The exercise programs are designed to improve upper- and lower-body strength, core stability, balance, range of motion, functional performance, and cognitive functioning. Finally, using the built environment (parks and community gardens) as a means to promote physical activity will be discussed. Keywords: Functional; Fitness; Independence; Strength; Balance.

### A SHORT FILM ABOUT THE DAILY LIFE OF AN OLDER WOMAN

Theou, Olga

*Geriatric Medicine Research, Department of Medicine, Division of Geriatric Medicine, Dalhousie University, Halifax, Nova Scotia, Canada.*

In 2008, I conducted my PhD project “Physical Function During Performance-Based Tasks and Throughout Daily Life. Is It Different Across Levels of Frailty?” in a rural area of Greece. During this project, community-dwelling older women were first screened for frailty and then fitted with four devices (accelerometer, HR monitor, EMG device, and GPS watch) to “quantify” their daily life. The quantitative data of the study was published in scientific peer-review journals, however, I felt that an important part of my study was not presented. By just looking at my articles, the reader could not see the actual daily activities of these women nor could they hear their thoughts about their everyday lives, information which I gained through my interaction with them. For this reason, I decided to create a film inspired not by the responses of my participants to my scientific questions, but on what they chose to share with me. The short film/documentary (approximately 21 min) is entitled “I Will Sleep When Night Falls” and focuses on the daily life of an older woman. A camera operator followed her through her daily activities to capture her everyday life. The final project emphasizes not only the description of one day of an older person’s life, but also my experiences from my PhD study. We focused on daily activities that are important to them, objects that surround them and their thoughts about daily life in the past and present. You could say that by making this film I stopped feeling “guilty” about presenting only what I considered important from my study and not letting my participants being heard about what they consider important to share. In this way, we contributed by giving voice to those typically unheard.

### EXERCISE AND FITNESS TRAINING AFTER STROKE (EFS)

Townley, Bex

*Later Life Training Ltd, UK.*

There is an increasing need for people who have had a stroke to engage in exercise, as a stroke often results in reduced strength, mobility, fitness and mood as well as social isolation. Many of these problems could be alleviated through exercise, but a stroke may also result in a myriad of additional challenges such as pain, impaired movement or comprehension,
which may render it difficult for people with stroke to access exercise facilities. These challenges – as well as other complications – need to be recognised and managed effectively by exercise instructors to enable people to exercise safely. Providing exercise classes for people after stroke can be hugely rewarding – but this requires specialist knowledge and brings with it a considerable responsibility. Although there is an increasing number of exercise referral schemes for people who have had a stroke, there was – until recently – no accredited course for exercise instructors to work with this population. This accredited Exercise after Stroke Specialist Instructor Training Course has been designed to fill this gap. This session will give the evidence base behind the training and allow participants to have a go at some of the exercises and see how to adapt exercises for people with different stroke-related functional and visual impairments.

**SETTING UP A NATIONAL EXERCISE REFERRAL SCHEME (IN WALES)**

Wyatt-Williams, Jeannie  
*Welsh Local Government Association, UK.*

The National Exercise Referral Scheme (NERS) is a Welsh Government (WG) funded scheme which has been developed over the last 5 years to standardise exercise referral opportunities across all Local Authorities and Local health Boards in Wales. NERS offers a 16-week programme for clients who have or are at risk of developing chronic disease; they have a consultations at weeks 1 and follow up consultations at weeks 4, 16, 32 and 52. The principal aims of the Scheme: To offer a high quality Exercise Referral Scheme across Wales; To increase the long term adherence in physical activity of clients; To improve physical and mental health of clients; To determine the effectiveness of the intervention in increasing activity levels and improving health. All protocols used on NERS represent the best current known practice and meet with current national guidance. WG commissioned a randomised controlled trial design to investigate whether self-reported physical activity and depression and anxiety at 12 months is different among those patients receiving an exercise referral programme compared to those receiving usual GP care. It also investigated the cost-effectiveness of NERS; its findings were: All participants in NERS had higher levels of physical activity than the control group, with this difference being significant for patients referred for coronary heart disease risk factors; There were positive effects on depression and anxiety; The economic evaluation demonstrated a cost per QALY of £12,111. For those who adhere to the programme there is a marginal cost saving (£-367 per QALY). In 2008, the WG agreed to fund the appointment of a National Coordinator to commission approved training which met the new National Occupational Standards for chronic conditions and develop standard protocols. These are being implemented where there are rehabilitation programmes in operation and exercise professionals hold the necessary qualifications.  
*Keywords:* Exercise; Referrals; Physical Activity; Costs; Economic.

**LEARNING FROM THE LIVED AGEING BODY: ADVANCING KNOWLEDGE OF PHYSICAL ACTIVITY IN LATER YEARS**

Phoenix, Cassandra¹; Kluge, Mary Ann²; Grant, Bevan³  
¹Peninsula College of Medicine and Dentistry, UK; ²University of Colorado at Colorado Springs, United States; ³Waikato University, New Zealand.

Little is known about the ineffable and less tangible - sometimes called the subjective knowledge - about the older active body. Older adults are individuals with stories that are
as mysterious as their bodies and whose biographical ageing is as intricate and important as their biological bodies, and pertinent to their health. Considering ageing from this perspective means giving attention to what older people themselves say about the role and meaning of living in and through an (in) active body. Knowledge and reality as lived do not exist apart. In this symposium, we present research findings from the UK, USA and NZ to illustrate the value of taking seriously people’s lived experiences of ageing and physical activity. In so doing, we consider what kind of knowledge can be expected; how it can enhance our theoretical assumptions about active ageing; and the consequences this has for policy and practice. First, Phoenix presents results from an Economic and Social Research Council funded project. Using in-depth life-history interview data, she illustrates the ways in which having and being an active body in older age is embedded within the broader context of one’s past, present, and anticipated future. Second, Kluge considers how researchers might come to understand the lived body. She provides examples where different methodological approaches have been used to elicit lived experiences of physical activity in older age (e.g. phenomenological approach, intrinsic case studies). Finally, Grant presents findings of an ethnographic study, which investigated the phenomenon of active ageing within its real-life context. When studying the development of a community initiative, physical activity and ageing was viewed from a social and cultural context as well as, an organizational and institutional perspective. **Keywords:** Active Ageing; Physical Activity; Demographics; Ethnographic; Culture.

**LIFEBALL - THE GAME YOU PLAY FOR LIFE**

Lord, Brian L

*Healthy Lifestyle Health Promotion Services, Australia.*

An Australian Community Health Educator has invented a walking pace team ball game for older adults. Called “Lifeball,” the game features rules to make it safe for older adults (no high throws, no contact between players, no walking backwards etc.,) and other rules to make it inclusive - every player must touch the ball, and every player has the chance to play every position. The game is based on netball and basketball - played on a similar sized court - but the goals are shorter (eye height) and off the end of the court by a few metres, making scoring still a challenge. The game is played by thousands of older Australians in clubs from Queensland, New South Wales, Victoria, South Australia, and Western Australia. It has been going for over 10 years in some centres, and the players maintain it is a “mainstream” sport (it is played in the Masters Games in two states) and a regular socialising attraction to rival any other mainstream team sport, and better than most - so much so that the score is rarely ever kept during the games. Research (1 masters, 1 honours, and several papers in Australian Health journals) on the efficacy of Lifeball has shown improvements in all aspects of physical wellbeing, but (not surprisingly), most respondents rated the social value of belonging to the Lifeball “family” as being the prime reason for playing. It is also played by people of much younger age (even primary schools play it) and hence the name - Lifeball - the game you play for life. **Keywords:** Ball Games; Seniors; Group Exercise.

**ACTIVATING OLDER ADULTS WITH NORDIC POLE WALKING AND POLE EXERCISE PROGRAMS**

Rutlin, Tom

*Exerstrider Products Inc., United States.*
Learn how to launch successful and popular Nordic walking and pole group exercise programs in continuing care retirement communities and senior wellness programs. Discover how such programs can sustain and increase participant involvement and significantly improve participants’ balance and functional independence, while creating a culture of mind, body, and spirit that enhances the overall vitality of your community. Earn an Exerstrider Method Nordic Walking Advanced Instructor certificate and learn how to grow your own “grass roots” community of Nordic walkers. Learning objectives: 1. Competently equip, fit, and instruct residents in Nordic walking and other FUN activity programs utilizing Nordic walking poles. 2. Understand and implement the steps required to attract and train a group of Nordic walkers and pole exercisers, which can then grow throughout the community and successfully attract many residents including those who already exercise and those who have traditionally been non-exercisers. 3. Maximize ongoing resident participation in physical activity while minimizing staff involvement, overhead, and facility space requirements while creating new revenue generating potential. Who should attend? CCRC fitness and wellness professionals and administrators who are looking for physical activity programs that address most ability levels, are easy to implement and won’t bust their budgets. Keywords: Nordic Walking; Group Exercise; Balance, Functional Independence.

PILATES MAT BASED MAGIC FOR THE ANTI AGEIST

Done, Sheila

*Modern Pilates and the Older Adult, Neuropilates & Later Life Training Ltd, UK.*

Functional exercises designed to combat the ageing process that sometimes interferes with the quality of life. This class will introduce the Pilates teachers and others to new ideas for their classes, and thus promote the health and well-being for the older clients. Research states to maintain bone density we should be on our feet for 4 hours a day. This session aims to keep the older client on feet for 40 min of those precious 4 hours - 40 min of quality bone loading.

Meet-the-Expert Sessions

PHYSICAL ACTIVITY AND HEALTHY AGEING: ENHANCING REGULAR PARTICIPATION

Hetherington, Sharon¹; Orpin, Peter²; Fell, James²; Shing, Cecilia²

¹Exercise & Sports Science Australia, Australia; ²University of Tasmania, Australia.

Despite the health benefits of regular physical activity, up to 50% of older people are not adequately physically active. In this study a mixed methods approach was used to better understand the complex interaction of environmental, social, and individual factors that contribute to older people’s physical activity behaviours. 223 participants (82±7 years) completed a physical activity survey assessing their physical activity level, perceptions of activity and the degree of social support for activity they received. Twenty people were selected for face-to-face interviews to explore in-depth the complex phenomenon of ageing and physical activity. Twenty-one% of participants were inadequately physically active. Interest in, perceived importance and utility of physical activity were high and positively associated with activity level, while the perceived amount of effort it took to be active was negatively associated with activity level. The least active quartile reported significantly higher effort associated with being active. Analysis of interview data revealed the main barriers...
to activity to be injury or illness, lack of competence and lack of time. Interviewees’ main motivations were the support of enthusiastic others, being fully engaged in activities and having fun while being active. Enhanced social engagement positively influences multiple factors within a model of health action and presents an important intervention point for changing people’s behaviour. Based on findings from the present study a health action model was developed that provides greater insight into the factors influencing physical activity behaviours. Findings supported the redistribution of barriers and motivators from a single factor as depicted in previous models to individual and specific factors. To increase participation in activities, exercise professionals need be skilled in a variety of motivational and leadership techniques that support engagement. Keywords: Physical Activity; Wellbeing; Social Engagement; Motivation.

Posters

SCOTTISH BELIEFS ABOUT LOW BACK PAIN: DOES AGE MATTER?
Holdsworth, Lesley; Ferguson, Fraser
NHS 24, United Kingdom

Introduction: Low back pain (LBP) is one of the most common musculoskeletal conditions for which sufferers seek medical attention. The societal costs of LBP are huge. Remaining active with LBP has shown to have been effective in helping sufferers to normal. Similarly, rest for LBP has been identified as harmful in promoting recovery. Maintaining activity levels in general has been shown particularly in the older population groups has been shown to maintain joint movement and muscle strength and contribute to reduced falls and mobility problems. LBP is a common complaint in an aging population. Description: A survey was conducted in 2010 via face-to-face public interviews to measure the incidence of back pain in a sample of the Scottish population and whether or not beliefs of back pain differed compared with age. Subjects were asked ‘had they had a history of LBP and whether they agreed with the following statements: ‘If you have back pain you should try and stay active’. ‘If you have back pain you should rest.’ Evaluation: 887 members of the Scottish public participated. 52 (n = 461) reported a history of LBP. The incidence of LBP increased with age, with subjects aged over 65 reporting LBP twice as much as younger age groups. Overall in those subjects with a history of LBP, 66% (n = 306) agreed with the question ‘If you have back pain you should try and stay active’. 53% (n = 245) agreed with the question ‘If you have back pain you should rest.’ In answers to both questions, subjects ≥ 65 and ≤ 30, were less likely to agree that activity was the best action and rest the worst action. Conclusions: In a sample Scottish population, LBP is common, more so in the older age groups. Whilst there are positive beliefs that activity is good for LBP, this is less in people over 65. With an aging population, the benefits of exercise to this age group should be emphasised not just for back pain but for general health benefits. Keywords: Musculoskeletal; Pain; Beliefs; Active; Strength.

TURNING TO SITTING-DOWN STRATEGIES AND VARIABILITY IN OLDER ADULTS: KINEMATICS AND ELECTROMYOGRAPHY ANALYSIS
Kuo, Fang-Chuan; Hong, Chang-Zern
Hungkuang University, Taiwan.
Background: Turning involves complex interactions between neural and biomechanical factors for postural stability in older individuals. The purpose of the study was to compare the kinematics and electromyography (EMG) of the head, lumbar, and knee during the turning in older adults to young ones. Methods: Twenty old adults (OA) and 20 young adults (YA) were recruited. Every subject performed “turning-to-sitting” test. A 16-channel telemetry EMG system with electrogoniometers and an inclinometer was used to record kinematic and EMG data. Results: OA group had lower joint displacements of lumbar lateral flexion and angular velocity of head flexion, and larger variability of head and knee angular velocity than young adults during turning step. The onset of the lumbar movement and head lateral flexion were earlier significantly in the OA group than the YA group. The old adults had higher muscle activity of right gastrocnemius, left biceps femoris, and left external abdominal oblique muscles than young adults through all turning phases. Conclusion: Comparing to young adults, older adults perform turning with higher velocity variability of head and knee joint but less lumbar displacement in frontal plane to cope with complex turning phases. Older adults need to increase the extensor synergy muscles of the stance leg to provide a braking force to avoid forward motion, and also to increase the external abdominal muscle activity for trunk roll motion during turning. Keywords: Postural Stability; Electromyography; Turning; Kinematics.

INFLAMMATION, FAT MASS, AND FUNCTIONAL DECLINE OVER 4 YEARS IN OLDER ADULTS OF VARIOUS BODY COMPOSITION

Lebon, Johann; Brochu, Martin; Dionne, Isabelle J.
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Objective: Obesity and elevated inflammatory markers are two factors that affect significantly mobility disability and functional decline in older person. However, to date, there are no studies that determined if the impact is independent to measure mobility disability using objective measures of physical capacity. Methods: 122 well-functioning adults aged 68-83 years old with various body compositions were followed for functional limitation over 4 years. Body composition (Fat mass (FM), total fat-free mass (FFM) and trunk FM obtained by DXA) and physical capacity (timed up and go (TUG), chair stands (CS), walking speed at normal and fastest pace (NWS and FWS), and one leg stand (LS)) at baseline (T1) and after 4 years (T4), were measured. Pearson’s correlations were used to examine the relations between C-reactive protein (CRP) with all physical capacity tests. Then, ANOVA and ANCOVA (adjusted for trunk FM) were used to compare participants divided in 2 groups based on the presence of elevated CRP (>3mg/ml) or not (<3mg/ml; measured with a high-sensitivity assay) with respect to physical capacity. Results: CRP is significantly and positively associated with TUG and CS at T1 and T4 (0.162 < r < 0.234; p < 0.05) and negatively for the other remaining tests (-0.293 < r < -0.167; p < 0.05). Most physical capacity tests (MWS-T1, TUG-T1 and T4, CS-T1 and LS-T1 and T4) were significantly different between the 2 groups of participants (p ≤ 0.05). When adjusted for trunk FM, this different was no longer present (p > 0.05) between the groups. Finally, a paired T-Test shows that physical capacity decline significantly between T1 and T4 whereas trunk FM increased significantly. Conclusion: Our data highlight that, in well functioning older adults, trunk FM seems more useful to predict mobility disability than level of inflammation. Intervention at early stages to reduce obesity may preserve physical capacity in this population over the time. This result needs to be further investigated. Keywords: Obesity; Inflammation; Physical Capacity; Mobility; Body Composition.
HABITUAL PHYSICAL ACTIVITY AND USUAL GAIT SPEED IN OLDER ADULTS

Osuka, Yosuke1; Yabushita, Noriko1; Kim, Mi-ji2; Seino, Satoshi1; Nemoto, Miyuki1; Jung, Songee1; Okubo, Yoshiro1; Rafael, Figueroa1; Matsuo, Tomoaki1; Tanaka, Kiyoji1

1University of Tsukuba, Japan; 2Metropolitan Geriatric Hospital and Institute of Gerontology, Japan

Introduction: Few studies have assessed the association between habitual physical activity, various confounders (e.g., age, disease), and usual gait speed (UGS). Classification and regression tree (CART) analysis can identify the interaction by stratification and segmentation, and is a better model for predicting impairments in older adults than multiple linear regression analysis. The purpose of this study was to identify the association between habitual physical activity and UGS using CART analysis in older adults. Methods: A cross-sectional analysis was conducted on data from 754 older adults, aged 60-101 years (73.6 ±6.9 years). Subjects were interviewed about medical history, joint pain, cohabitation, smoking, drinking, depression, and habitual physical activity (frequency of household and job; the quantity of moderate-to-vigorous-intensity exercise: MVE). UGS less than the lowest quarter (<1.06 m/s) was defined as low-UGS. CART analysis was performed to identify a hierarchical order and interaction between different habitual physical activity levels and other variables (age, number of medications, stroke, heart disease, osteoporosis, low back pain, knee joint pain, living alone, drinking, depression) with low-UGS. Results: Age, depression, and MVE were significantly associated with low-UGS. Age (>77.5 years) was the most important factor to increase the prevalence of low-UGS. The MVE was significantly associated with low-UGS in those aged over 82.5 years. For those aged less than 77.5 years, there was no factor associated with low-UGS. For those aged 77.5-82.5 years, depression was associated with low-UGS. Misclassification rate of this tree was 18.3%. Conclusions: It is suggested that adults aged 78-83 years and who have depression, and those aged over 83 years who do not participate in MVE at least 50 min/week, are likely to have low-UGS. Keywords: Physical Activity; Gait Speed; Depression.

STRETCHING TRAINING, MAXIMUM MUSCLE STRENGTH AND FLEXIBILITY, IN THE ELDERLY

Gallo, Luiza H1; Gurjão, Andre LD1; Prado, Alexandre KG1; Ceccato, Marília1; Gonçalves, Raquel2; Gobbi, Lilian TB1; Gobbi, Sebastião1

1São Paulo State University, Campus of Rio Claro, Brazil; 2Federal University of São Carlos, Brazil

Although it is known that stretching exercises can enhance flexibility, questions remain regarding the impact of stretching training on muscle strength in old people. Thus, the aim of this study was to analyze the effect of an eight-week stretching training on maximal voluntary contraction (MVC) and flexibility in the elderly. Twenty-six older women were randomly assigned either into a training group (TG; n = 13; 69.7±8.8 years; 64.6±10.8 kg; 1.53±0.07 m; 27.5±4.6 kg/m²) or control group (CG; n = 13; 66.6±6.0 years; 75.3±13.1 kg; 1.58±0.07 m; 30.3±5.6 kg/m²). Both groups attended the laboratory three times a week for eight weeks. The TG performed three sets of eight static stretching exercises for major muscle groups, which were held for 30 seconds; the CG participated in artistic and cultural activities, which did not involve systematic physical activity. The MVC was obtained by means of a force transducer while the participants performed maximal isometric unilateral knee extension on a leg extension machine (chair). Flexibility was assessed by means of the sit and reach test. For statistical analysis, a two-way ANOVA (2 × 2) for repeated measures
and the Scheffé post hoc test were used (p < 0.05). There was no statistically significant difference between pre-and-post experimental period regarding the MVC, for both groups (TG: Pre = 216.9±51.2 and Post = 221.0±61.0; CG: Pre = 255.8±87.8 and Post = 259.0±89.2). The ANOVA showed group × time interaction and significant time effect for flexibility (p < 0.01) (TG: Pre = 51.6±1.0 and Post = 58.3±9.9; CG: Pre = 49.7±8.8 and Post = 49.6±9.7). In conclusion, eight weeks of stretching training: a) are not effective for improving maximum muscle strength; b) on the other hand, they can be beneficial to increase flexibility, in older women. **Keywords:** Stretching; Flexibility; Strength.

**THE EFFECTS OF STRENGTH AND POWER TRAINING ON FUNCTIONAL ABILITIES IN OLDER ADULTS**

*Sipe, Cody¹; Lyle, Roseann²; Ritchie, Daniel³*

¹Harding University, United States; ²Purdue University, United States; ³Miracles Fitness, United States

The purpose of the study was to compare the effects of strength and power training on the functional abilities of older adults. Thirty-two male (n = 7) and female (n = 25) volunteers (74 ± 6.2 yrs) participated in this randomized controlled trial. All groups performed 3 sets of 10 repetitions on 6 pneumatic resistance machines 3 days per week for 12 weeks. The high-velocity 70% 1RM (70% Fast, n = 11) and the high-velocity 50% 1RM groups (50% Fast, n = 8) performed the exercise movements as quickly as possible during the concentric phase. The low-velocity 70% 1RM (70% Slow, n = 13) group performed the exercise movements in a slow and controlled fashion (2-3 sec) during the concentric phase. Leg press strength, peak power, and average peak power were assessed using a computerized pneumatic system. Functional performance was assessed from 50′ fast walk test, 30-sec chair stand, 8-ft timed up-and-go test (TUG), Berg Balance Scale (BBS) and Activities-Specific Balance Confidence Scale (ABC) before and after the 12-wk intervention. There were main effects of time (p < .05) for leg press strength, peak power, average peak power, BBS, 50′ fast walk, and 30-sec chair stand. There were no main effects for group. Significant interactions were found only for the ABC and 50′ fast walk. Post-hoc analyses revealed that the 70% Fast group declined significantly (p < .05) on the ABC and increased significantly on the 50′ fast walk test (p < .05). Partial correlations at baseline, when controlled for age, revealed significant relationships between peak power and average peak power with all measures of function accounting for 20-24% of the variance in performance. Leg press strength, when controlled for age, was significantly correlated only with performance on the chair stand test. In conclusion, high and low-velocity training improved functional performance. Although the relationship between power and function was strong, the added benefits of training at higher velocities remain equivocal. **Keywords:** Strength; Power; Functional Performance; Exercise.

**DAILY SITTING TIME AND PHYSICAL PERFORMANCE TEST IN BRAZILIAN ELDERLY OVER 80 YEARS OF AGE**

*Borges, Lucélia J; Conceição, Renata da; Meneghini, Vandriz; Souza, Tiago Rosa de; Barbosa, Aline R*

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**Objective:** The cross-sectional epidemiological and household-based study was to examine the association between daily sitting time and physical performance in all residents (n = 134) aged 80 + years in Antônio Carlos, Santa Catarina State, Brazil. **Method:** Physical inactivity was ascertained through reported time spent sitting/day (International Physical
Activity Questionnaire). Physical performance test was assessed using tests “chair stand” and “pick up a pen” (assessed by time), and “balance” (four measures of static balance). The associations between the dependent variable (sitting time) and the explanatory variables (dichotomized physical performance tests) were carried out using the chi-square test or Fisher’s exact test and Binary Logistic Regression. The significance level adopted was \( p < 0.05 \). **Results:** The results showed that the mean sitting time was higher for women. The elderly men had good results in all physical performance tests. Women who spend more time sitting have, respectively, 2.92 (IC95%:10.3;82.3) and 3.68 (IC95%:11.3;120.2) more chances of performing poorly in the “chair stand” and “balance” tests. **Conclusion:** The results suggest that longer sitting time is a limiting factor of good performance in the tests, and this should be taken into consideration when assessing physical performance in long lived elderly women. **Keywords:** Physical Inactivity; Sitting Time; Performance; Brazilian.

**DYNAPENIC-OBESEITY AND DEPENDENT STATUS IN OLDER WOMEN**

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**Introduction:** Dynapenia (low muscle strength) and obesity are independently associated with low physical function. Although a few studies have shown that dynapenic-obesity is associated with poor physical function, little information is known about the association between dynapenic-obesity and dependent status. The purpose of this study was to determine whether dynapenic-obesity would have a higher risk for dependence. **Methods:** This cross-sectional study included 255 older women, aged 65-101 years (77.7 ± 8.0 years). They were assigned to one of three categories: independent, frail, or dependent according to the classification criteria of the long-term care insurance system in Japan. Fat mass was estimated by bioelectrical impedance (BI) method. As a measure of muscle strength, knee extension strength and handgrip strength by dynamometer were measured. Participants were classified into four independent groups: normal, obese, dynapenic, and dynapenic-obese, based on fat mass and muscle strength (knee extension strength and handgrip strength) tertiles. Logistic regression analysis was conducted to determine whether obesity and dynapenia status had additive effects on dependent status. **Results:** Compared with the normal group, the age adjusted adds ratios (95% confidence interval) for dependent status were 10.89 (3.35-35.46) in the dynapenic-obese group, 7.03 (2.49-19.83) in the dynapenic group, and 1.98 (0.61-6.42) in the obese group as determined by knee extension strength and fat mass. When determined by handgrip strength and fat mass, dependent risk was elevated in the dynapenic-obese group (16.00, 5.06-50.57), followed by the dynapenic group (6.04, 2.07-17.62), and the obese group (0.87, 0.22-3.54). **Conclusion:** These results suggest that dynapenic-obesity is more tightly associated with dependent status as compared to obese and dynapenic groups. Handgrip strength may reflect dynapenic-obesity more than knee extension as a measure of muscle strength. **Keywords:** Dynapenic-Obesity; Physical Function; Strength; Dependence.

**BODY IMAGE IN A REPRESENTATIVE SAMPLE OF OVERWEIGHT OLDER WOMEN: CORRELATIONS WITH BODY COMPOSITION AND FUNCTIONAL CAPACITY**

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Purpose: To examine relationships between body composition and functional capacity according to body image in a representative sample of overweight physically active older women. Methods: We measured body composition (body mass, body mass index [BMI] and waist circumference [WAIST]) and functional capacity (grip strength [GS], lower limb strength [LLS], chair stand, balance, walking velocity, maximal walking velocity, cardiovascular endurance [SIP], arm curl and 30-second chair stand) on 398 overweight women (BMI > 27 kg/m²). Other 304 women were considered as control volunteers. Current (CBI) and ideal body image (IBI), and dissatisfaction (DS [current - ideal]) were determined by silhouettes (ranging from very thin [1] to very heavy [9]). Results: The prevalence of DS ranged from 60.2% to 82.4%. Body mass, BMI and WAIST were important predictors of DS. CBI and IBI were consistently and positively correlated with balance, walking velocity, arm curl and 30-second chair stand. There were some few significant positive correlations with DS in obesity group. Multiple regression analyses verified positive (CBI) and negative associations (DS) for balance in obesity and overweight plus obesity categories. It was also observed a positive association with walking velocity and maximal walking velocity for current (eutrophic, obesity and overweight and obesity categories) and IBI (overweight). It was also observed associations for SIP, arm curl and 30-second chair stand. In general, there was an age-mediated effect for almost all associations. Conclusion: Our results demonstrate that physically active older women showed an elevated prevalence of dissatisfaction regardless of BMI, which mediated by age, impacts on functional capacity; similar phenomenon seems to be expanded for current body image. Keywords: Body Image; Body Composition; Obesity; Dissatisfaction.

THE EFFECTS OF PHYSICAL ACTIVITY IN IMPROVING THE MUSCULOSKELETAL CONDITIONS OF STROKE SURVIVORS

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Introduction: Stroke is a significant leading cause of mortality in Westernized countries. The prevalence of stroke is expanded with increasing age, and it leads to disability of the ageing population with musculoskeletal impairment like muscle weakness, imbalance gait, and increase fall risk. Physical activity participation is identified as one of the approaches to improve the musculoskeletal conditions apart from medication treatment. The purpose of this study is to identify the effects of physical activity in improving the musculoskeletal conditions of stroke survivors. Methods: Literature was searched with key works “physical activity,” “musculoskeletal,” and “stroke” on multiple databases. The relevant literature were reviewed and analyzed by thematic analysis. The results were summarized and presented. Results: Physical activity participation demonstrated positive results in improving musculoskeletal fitness and enhancing walking ability among stroke survivors. Planned physical activity programs showed significant positive effects on the balance and gait performance. It is supported that the balance ability was increased with decrease fall risk and lesser use of assistive devices for walking. Nevertheless, the ambulatory capacity, musculoskeletal contractile ability, and muscle strength are improved by regular physical activity. Conclusion: This study supports the beneficial effects of physical activity on the musculoskeletal conditions of stroke survivors.
conditions of stroke survivors. It is recommended to encourage physical activity participation among stroke survivors as to minimize the post-stroke musculoskeletal disability. **Keywords:** Physical Activity; Musculoskeletal; Stroke; Balance; Gait.

**EFFECT OF LIGHT EXERCISE ON MUSCULAR STRENGTH AND FUNCTIONAL FITNESS OVER 12 MONTHS IN FRAIL COMMUNITY-DWELLING OLDER ADULTS**

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The purpose of this study was to determine the effect of two light-intensity exercise programs on lower body muscular strength and functional fitness over 12 months in a group of frail community-dwelling older adults. Sixty-one individuals, mean age (±SD) 72 (±10) yr, were assigned into two groups (resistance (R) group = 32 and balance (B) group = 22). The resistance group underwent a 12-wk exercise program using an exercise band and a pneumatic exercise kit in the seated position and the balance group underwent a 12-wk program using a pneumatic exercise kit for customized balance exercise in the seated position. Both groups performed the program for 12 months. Measures of lower body muscular strength (knee extension (KE), ankle dorsal extension (AE) and flexion (AF), hip adduction (HAD) and abduction (HAB)), functional fitness (chair stand (CS)), gait speed for 10m (WT), functional reach (FR), and single leg balance with eyes open (SLB) were assessed at pre- and post-3 months and again at 12 months. Significant improvements in both groups were noted for KE, AE, and HAD muscular strength at three months and these effects were maintained at 12 months (except AE in B group). No changes were found for CS, WT, FR, or SLB. These results indicate that light-intensity exercise consisting of either resistance or balance activities is effective in improving strength among frail older adults. However, likely due to the seated nature of the exercise program, functional fitness, walking speed, and balance did not improve. The development of other light-intensity exercise programs to improve these measures in this population is warranted. **Keywords:** Resistance; Balance, Strength; Fitness; Frail.

**MAXIMAL MUSCULAR FORCE RECOVERY AFTER RESISTANCE EXERCISE IN OLDER WOMEN**

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The recovery of the capacity to produce muscular force, in the elderly, is a very important parameter on exercise prescription and control. However, such parameter has been poorly studied, mainly in trained individuals, particularly in the elderly. The purpose of this study was to analyze the maximal voluntary contraction (MVC) recovery, in elderly trained women after leg press exercise. Fourteen resistance trained older women (66 ± 4 years; 68.8 ± 13.3 kg; 1.58 ± 0.05 m; 27.7 ± 5.2 kg/m²) volunteered for participation. They performed two different conditions, control (CON) and exercise (EX). In both conditions, the MVC was assessed through maximal isometric effort of unilateral knee and hip extension by means of a force transducer. In the EX condition, the participants performed three sets of 15 maximal
repetitions (100% of 15 RM) of horizontal leg press exercise with 2-min rest period between sets. The evaluations occurred five min (POS 5), 24 (POS 24), 48 (POS 48) and 72 (POS 72) hours after exercise. Regarding the CON condition, the MVC was assessed in the same way of the EX condition, except the previous exercise performance. A two-way ANOVA (2x4) with repeated measures was applied in order to compare different conditions and times. The level of significance adopted was p < 0.05. The results were 980 ± 233, 1015 ± 241, 1007 ± 250 and 1020 ± 216 to EX condition and 1017 ± 228, 1033 ± 267, 1020 ± 253, 1024 ± 253 to CON condition at POS 5, POS 24, POS 48 and POS 72 respectively. The statistical analysis showed no significant interaction of condition by time (F = 0.373; p = 0.773) and no significant main effect of time (F = 2.701; p = 0.218). In conclusion, resistance trained older women recover their ability to produce maximum isometric force as soon as five min after having performed their sets of resistance exercise. **Keywords:** Resistance Exercise; Muscular Force; Women.

**PRELIMINARY INVESTIGATION OF JUMPING ABILITY OF OLDER ADULTS**

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Much research has investigated which factors determining the loss of functional ability, particularly mobility, with increasing frailty and disability in older adults. Lower extremity muscle power has been suggested as a better predictor of mobility performance than muscle strength. A maximal vertical jump is a useful movement to measure maximal joint power capacity in a whole body movement [1] and it is an accurate and reliable movement to test power and bilateral strength deficits [2]. Studies have assessed the jump ability of older people have shown that jump ability is affected by training and related to functional ability [3]. The height of flight is related to the overall capacity of the limbs to produce movement and individual joint power output and reduced capacity at the joint can be determined [4]. Therefore it may be a useful, demanding movement to assess musculoskeletal capacity in older people. The jumping ability of older participants with low (LA) and high (HA) timed-up-and go scores and activity levels was assessed. Participants performed maximal vertical jumps on two forceplates while kinematic data was recorded using a 9-camera VICON infrared system. The LA participant did not jump as high as the HA participant. Reduced range of motion at all joints coupled with eccentric power absorbed in the lowering/countermovement phase was evident. This was followed with reduced concentric power in the propulsion phase. This movement may prove to be a useful movement to assess joint and overall power capacity. The movement may indicate the specific joints which should be targeted in a strength and power training programme. **References:** 1. Fukashiro, S. et, I, 1987. IJSM 8, 15-21; 2. Impellizzeri, F.M., et al., Medicine & Science in Sports & Exercise, 2007. 39, 2044-2050; 3. Kalapotharakos, V.I., et al., The Journal of sports medicine and physical fitness, 2005. 45, 570-5; 4. Strike, S.C. and C. Diss, Prosthet Orthot Int, 2005. 29, 39-51. **Keywords:** Jumping; Musculoskeletal; Functional Ability.

**A GREATER REDUCTION IN HEART RATE COMPLEXITY DURING 6-MIN WALK TEST IS RELATED TO A BETTER PERFORMANCE AMONG ELDERLY WOMEN**

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**Introduction:** It has been described a phenomenon of Cardiac Autonomic Resources during the execution of mental tasks, by which those who were capable of greater reducing their Heart Rate Variability (HRV) during the task (in relation to their baseline HRV) achieved a better performance (1). However, linear methods employed by Hynynen et al. (1) have been deprecated to assess cardiac autonomic control during exercise (2), whereas analysis of HR complexity seems to provide a suitable approach (3). Therefore, our purpose was to examine whether the change in HR complexity from resting to exercise condition was related to performance in a physical task among elderly women. **Methods:** 24 older women (71.4±3.6 yrs) participated in the study. Heart interbeat intervals (RR) were recorded during 10 min using a Polar RS800 in a resting situation and during a 6-min walk test. Then the last 5-min epoch from resting and exercise recordings were artifact corrected and those subjects with > 3% of artifacts were excluded from the analysis. Eventually, HR complexity was quantified by means of Sample Entropy algorithm (SampEn), utilizing Kubios HRV software. Pearson correlation analysis was used to assess whether SampEn was related to distance covered in 6MWT. Previously, values of SampEn at resting condition were set at 100% and exercise ones expressed in relation to this individual 100%. **Results:** SampEn was largely and significantly correlated with 6MWT (r = -.58; p < 0.01). **Conclusions:** Our results confirmed that Cardiac Autonomic Resources hypothesis proposed by Hynynen et al. (1) is also applicable to elderly women response to aerobic efforts (i.e.,6MWT). Accordingly, a larger reduction in SampEn during the 6MWT, thus indicative of a greater usage of autonomic resources and capacity to respond to a given challenge, would enable a better performance. Hence, HR dynamics analysis during physical tasks is suggested as a way to assess cardiac autonomic response capacity among elderly women. **Keywords:** Heart Rate; Cardiac; Aerobic Fitness; Autonomic.

**THE EFFECT OF TAI CHI ON MOBILITY AND STRENGTH IN LOW INCOME FEMALE SENIORS WITH ARTHRITIS**

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Tai Chi is an ancient form of exercise which dates back over 500 years. Requiring slow precise movements combined with breathing techniques, tai chi is a safe exercise option for seniors. Arthritis is a prevalent disease amongst seniors which can limit and reduce their daily activities. Using tai chi would be a safe and inexpensive method to allow seniors to engage in physical activity. Little is known about the health effects of tai chi programs in a community based setting. **Purpose:** To assess the mobility and strength of female seniors with arthritis after involvement in a 12-week community based tai chi intervention. **Methods:** A total of 61 women between the age of 55-84 who have arthritis and who live in low-income urban neighbourhoods were considered for this study. Upon recruitment in the study, all participants completed physical tests including but not limited to hand grip dynamometer, sit and reach, up and go, functional reach, 30 second chair stand, and 30 second arm curls. The physical measures were then repeated after 12 weeks had transpired. Demographic characteristics such as age, race, income, education level, marital status, and gender were collected. A paired samples t-test was conducted to assess differences in pre and post means of all physical measures. **Results:** Approximately 93% of seniors earned <$14,000 with an education of junior high or less (78%). Participants were ethnically diverse with Chinese (21%) and Guyanese (18%) being the largest groups respectively. A significant improvement was reported with an increase in handgrip strength (P = 0.013), up and go (p = 0.00),
functional reach test (p = 0.049), 30 sec arm curl (p = 0.00), and 30 sec chair stand (p = 0.00). **Conclusions:** Improvement in various musculoskeletal and mobility measurements illustrate that Tai chi is beneficial for seniors suffering from arthritis. Tai chi may be used at a community wide level as a safe activity to increase fitness in subjects with arthritis. **Keywords:** Tai Chi; Strength; Arthritis; Urban; Mobility.

**PREVALENCE OF MUSCULOSKELETAL INJURIES IN SPANISH MASTER TRACK AND FIELD ATHLETES**

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**Introduction:** The joining to sport competition is a current leisure physical activity among adults and elderly, even though there is a high risk of musculoskeletal injuries. The prevalence of injuries should be known in order to develop useful prevention strategies. Our purpose was to record the prevalence of injuries in elite track and field Spanish master athletes, and explore if there were risk groups (gender, modalities, or practice time). **Methods:** A cross-sectional survey was carried out during 2010 Spanish indoor championship for master athletes. One hundred ninety-four (158 males, 36 females, (35-91 years old)), from an eligible study population of 821 athletes, accepted to participate in our study. All subjects filled a questionnaire about their modalities; sport training history and musculoskeletal injuries (MEI). According with the previous data, two groups were created: (AG) aerobic group, (SPG) speed-power group. Frequencies of injuries were calculated to establish the prevalence; odds ratios were performed to estimate the risk of injury between genders, training-competition, and AG-SPG groups. **Results:** The prevalence of injuries was higher in AG than SPG (OR = 1.4, p < 0.05). Training sessions showed the highest prevalence of total cases of injury (83%). Women did not have a higher MEI risk than men (OR = 0.3; p > 0.05), and the highest prevalence was between 40-49 years. The most affected regions were hamstrings (20.4%), knee (17.66%), calf (17.16%), ankle (12.69%), and foot (8.21%). Both genders had similar injury patterns in lower limb: thigh (women, 21.42%; men 27.4%), calf (women, 20%; men 27.7%) and knee (women: 17.4%; men 18.3%). Conclusions: We found a higher risk of MEI on AG than SPG. Our results suggest that master athletes need be screened frequently in order to avoid regular injuries, mainly during the training. Future studies should be focused on the relationship between load training and MEI types to improve prevention. **Keywords:** Musculoskeletal; Injuries; Spanish; Athletes.

**OLDER ADULTS’ PERCEPTIONS AND VALUES IN RELATION TO PHYSICAL ACTIVITY**

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Fife Physical Activity Strategy Group (FPASG) commissioned a study to gain a better understanding of older adults’ perceptions and values in relation to physical activity and whether or not this changed with different groups of older adults (as defined in “Active for Later Life”, Health Scotland 2007). 223 participants took part in the study and information was gathered using focus groups and a questionnaire (on-line and self-return). 84% of respondents were retired. In relation to the defined groups, 64% did not consider their health to affect their capacity to undertake daily living, 33% felt that they had some limits due to health
and 3% were dependent on others to help them. The study aimed to establish: 1. what was important to older adults in maintaining a healthy older life and how they valued physical activity; 2. what their perceptions were of the terminology used and what physical activity meant to them; 3. to what extent did their own and other’s beliefs affect their participation in physical activity; 4. their awareness of what physical activity they should be doing to maintain health in later years. The study found that in general participants valued their health and the impact that physical activity had on this. Differences were noted between those in employment and the retired, and between different levels of dependency. As a result of the study, it was recommended that FPASG should review the messages about physical activity given by agencies to different groups of older adults, ensuring that the aspects of health that can maintain or promote health are highlighted. Attention needs to be given as to how activities can be adapted for and promoted to different groups of older adults, as does how to motivate and encourage participation. The report also recommended that a communication and promotional plan, reflecting different groups of older adults, needs to be developed, and that the training needs of service providers needs to be investigated. Keywords: Perceptions; Values; Physical Activity; Dependency; Focus Group.

CDSM FOR HEALTH: A DEVELOPMENTAL APPROACH FOR ACCREDITED EXERCISE PHYSIOLOGISTS AND HEALTH PROFESSIONALS SUPPORTING SELF MANAGED CHANGE FOR ADULTS

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Initiative: A priority focus in the Australian National Chronic Disease Strategy (Australian Better Health Initiative:2006) has been training in chronic disease self-management (CDSM). In 2009 Active Ageing Australia (AAA) collaborated with Ortran Self Management Solutions and the Centre For Physical Activity in Ageing to develop a Federal Government funded project CDSM for Health, a training program for 100 Accredited Exercise Physiologists (AEP) to provide CDSM support for their clients. Aims: Development of 1) personal professional skills 2) a professional community of practice to facilitate CDSM support 3) and implement a plan for the delivery of this training including other Allied Health professions (AHP), 4) a supporting and professionally confirming mode of interaction for AEP’s, 5) to better understand the diversity of practice settings that AEP’s work, 6) individuals to further deliver this training. Methods: An online training module was developed utilising a Moodle learning platform which was completed prior to participating in a face-to-face workshop of skill development for clinician/client interaction. The training provided the foundation for individual development within participants’ own work environment. Online forum participation provided ongoing personal development and reflection opportunities. Outcomes: 1) 91 of 100 AEPs progressed to various stages of the training and development. 2) Participants completed a post training evaluation and personal development plan. Participant reflections revealed high support for the training content and methodology. 3) An evidence-based resource for effective CDSM support in a range of settings has developed and is the subject of further study. Ongoing training is continuing through AAA. Conclusion: The project outcomes indicated that CDSM for Health content and methodology provided a foundation for support of self-managed change in a clinical exercise setting. AAA continues CDSM development training for a range of AHP’s. Keywords: Self-Management; Health Professionals; Training; Evidence-Based.
POSITIONING OF THE OMRON WALKING STYLE PRO PEDOMETER: DOES IT MATTER?

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**Background:** Pedometers are frequently used as motivational tools in interventions aiming to increase physical activity. Especially for older adults, handling of the pedometer should be as easy as possible. According to the manufacturer, the Omron Walking Style Pro pedometer can be worn not only on the waist (the usual location) but also at other locations on the body. The aim of this study was to evaluate the validity of this pedometer when worn at different locations.

**Methods:** Forty subjects (20 males, 20 females) aged 37.5±14.7 years (body mass index 24.4±3.8 kg m⁻²) participated in the study. All participants wore the Omron Walking Style Pro (HJ-720IT-E2) pedometer on the left side of the body at the following locations: shirt’s chest-pocket, waist belt, sling bag, and pant’s front-pocket. One single instrument was used for all measurements to exclude any influence of inter-instrumental differences on the results. Every participant walked (self-paced) four times on an oval 400-meter outdoor track. The wearing location of the pedometer was changed (in randomized order) after every lap. To determine the actual steps (AS) taken, every lap was videotaped and analyzed for number of steps and time. For every location the intra class correlation (ICC) between AS and steps measured by pedometer (PS) and the absolute% error [APE = (PS-AS)/AS*100%] was calculated.

**Results:** Walking speed, stride length and AS did not differ between the four wearing locations. ICC (95% confidence interval) between AS and PS was 0.990 (0.980; 0.995) for the shirt pocket, 0.989 (0.980;0.994) for the waist belt, 0.988 (0.976;0.994) for the sling bag, and 0.968 (0.941;0.983) for the pant pocket. APE was -0.35±0.92% for the shirt pocket, 0.03±1.03% for the waist belt, -0.35±0.99% for the sling bag, and -0.22±1.80% for the pant pocket.

**Conclusion:** The tested pedometer can accurately count steps during self-paced walking when worn at different locations on the body. **Keywords:** Pedometer; Walking; Positioning; Steps.

OLDER ADULTS’ PERCEPTIONS OF NORDIC WALKING AND ITS LONG-TERM EFFECTIVENESS ON PHYSICAL ACTIVITY BEHAVIOUR

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This study examined older adults’ perceptions of Nordic walking and its long-term effectiveness on physical activity behaviour. Retrospective telephone interviews regarding a Nordic walking programme completed eight months previously were conducted with 78 older adults aged 50-85 years. It was established that 81% of the participants self-reported currently engaging in regular physical activity, with 44% of those still participating in Nordic walking. Interview data were inductively analysed and overall themes relating to perceived benefits of Nordic walking were established: gain physical benefits; mastery experience and social interaction. Overall older adults’ perceptions of Nordic walking were positive, suggesting that Nordic walking is considered a feasible and appropriate activity. Social validation findings suggest that future design and delivery of Nordic walking programmes should consider inclusivity of older adults who reside in nursing homes as these individuals could gain additional benefits from Nordic walking yet are currently a hard to reach sub-group. **Keywords:** Perception; Nordic Walking; Physical Activity; Interviews.
PHYSICAL ACTIVITY AMONG OLDER ADULTS WITH SIGHT LOSS: A QUALITATIVE RESEARCH STUDY TO INFORM POLICY AND PRACTICE

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In light of an ageing, largely inactive population and decreasing budgets for health and social care the promotion of healthy ageing through regular physical activity is a government priority. The Department of Health physical activity recommendations and indeed the aforementioned policy initiatives are relevant to older adults with sight loss as their sighted peers. However, like research in general, they have little to say about the involvement of older adults who are experiencing late onset sight loss, nor how their participation can be facilitated. The absence of this population within current policy recommendations and research is especially alarming because what with there is shows that visually impaired older adults, in general, have poorer general health than the sighted population. Also important is the fact that we policy makers, organisations, and so forth cannot assume that what is known about one population (e.g. older sighted people/young physically active/young visually impaired people) can simply be transported into recommendations for promoting physical activity among another (e.g. older adults with sight loss). The proposed research therefore responds to our lack of knowledge by examining the following: 1) What does it mean to be physically (in) active when living with late onset sight loss in older age?; 2) Why do some visually impaired older adults adopt and maintain a physically active lifestyle when others may not?; and 3) How is physical activity accomplished (or not) within the context of everyday life? Results are discussed in light of theories within social gerontology and the sociology of ageing. Keywords: Physical Activity; Vision; Policy.

SPECIFICS OF THE TRANSITION PERIOD AND ITS IMPACT ON THE DEMOGRAPHICS OF THE ELDERLY

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Introduction: Although the elderly take up a small proportion of the population of Kazakhstan, this group uses considerable economic and medical resources. The aim of the study is to investigate the age and gender characteristics of the population of Kazakhstan during 2002-2009. Methods: We used the statistics collected by the Ministry of Labour and Social Welfare of the Republic of Kazakhstan. Results: The process of demographic aging had different consequences for men and women. The percentage of elderly women exceeds that of elderly men, especially at older ages. In 2002, there were 4.8% of persons aged above 65 years among men but 9.1% among women. In 2009, the percentages were 5.4% and 9.5%, respectively. At this time, for every 1,000 elderly men, there are 1,870 elderly women. In 2002-2007, with increasing age, the female-to-male ratio increased in the age groups of 65-74 years, while in the age groups of 75-84 years, this ratio becomes less extreme. Several peculiarities have been observed when comparing middle-aged men and women residing in urban and rural areas. Specifically, the average age of urban residents did not significantly change from 2003 to 2009. However, there was an increase in the average age of rural residents from 30.4 to 31.4 years among women and from 28.1 to 29.3 years among men. Conclusions: This study shows that in terms of the aging processes, Kazakhstan is situated between developed and developing countries. Aging-associated problems should be dealt
with by integrating the programs of social welfare, health care, education, and employment. 

**Keywords:** Demographics; Rural; Urban; Kazakhstan.

**PREDICTORS OF PHYSICAL ACTIVITY IN A 1-YEAR FOLLOW-UP AMONG FRENCH OLDER ADULTS: A PROSPECTIVE STUDY**

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**Introduction:** Maintaining a physically active lifestyle is a hard to achieve behaviour. This behaviour can be influenced by several variables, including socio-demographic, physical, psychological, social, environmental, and cultural aspects. The purpose of the present work was to examine the importance of several variables in determining the level of physical activity in a 1-year follow-up among French older adults. We particularly examined the direct and indirect roles played by physical function decline in determining physical activity (PA). 

**Methods:** Participants were 168 women and 99 men, aged 70.7 ± 7.3 years-old, and who were covered by the medical insurance of the French National Education System. They completed a self-report questionnaire on PA and general health twice, at a year’s interval (postal survey). Multinomial logistic regressions with PA level as the dependent variable were performed. 

**Results:** Physical function predicted PA level: the higher the declines on physical function, the lower the probability of having a high level of PA compared to a low level. When physical function decline was dropped from the model, age and satisfaction with body functioning were the only predictors of the level of PA. Physical function decline modulated the associations between PA level and each of the following variables: age, sex, and satisfaction with body functioning. 

**Conclusions:** Physical function decline is an important predictor of PA level one year later among older adults. Satisfaction with body functioning is possibly a relevant predictor of PA among persons who do not have declines on physical function. Interventions that help older adults to avoid decreases in physical function (other than PA, such as pain and disease management – cataract surgery, for example) would probably promote a physically active lifestyle in this population. 

**Keywords:** Physical Activity; Physical Function; Satisfaction; Sex.

**IMPLEMENTATION OF ACTIVE AGEING MODEL TO IMPROVE SOCIAL SUPPORT IN COMMUNITY DWELLING ELDERLY**

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**Introduction:** The WHO promotes health and well-being throughout the life course; Elderly are defined as people over 65 years of age (WHO). The 2001 census has shown that the elderly population of India accounted for 77 million. While the elderly constituted only 24 million in 1961, it increased to 43 million in 1981 and to 57 million in 1991. Social integration and participation of older adults in society are frequently seen as indicators of productive and healthy aging and it is widely accepted that social support has a strong protective effect on health. 

**Need of Study:** A better understanding is needed of the prevalence of social support in community dwelling elderly in India. And whether the active ageing model can provide social support Place, Type of the study Chattarpur, Delhi Prospective non-randomized unblinded experimental study Duration, sample size 12 months, 300 elderly. 

**Inclusion Criteria:** Elderly (above 65years) willing to participate; Ability to read/write either English or Hindi. 

**Exclusion Criteria:** Elderly /subjects totally dependent for their activi-
ties of daily living requiring institutional support and care; MMSE < 23. **Methodology:** Collaborate with a senior citizen organization. Identify health issues. Distribute books on Health Awareness. Conduct workshops on health issues. Select of leaders from the targeted group of elderly. Form groups (members and leader). One to one home visits by health professional. Demonstrate physical exercises. Depression, social support, and QOL will be measured by GDS, SNQ, WHOQOL. Monthly group activities. QOL monitored twice in 6 months time. **Conclusion:** The study would help frame work policies for Indian elderly that may constitute a feasible alternative for substituting the current situation. **Keywords:** Social Support; Policy; Health Awareness; Quality of Life.

**SENIORENGAGE: PROJECT CONNECTS SENIOR AND YOUNG PROFESSIONALS**

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Demographic change brings many challenges to face in labour market. More and more seniors with good health are retiring, which means e.g. losing valuable tacit knowledge. SENIORENGAGE -project addresses the need to help retired senior professionals retain their sense of self-worth and continue to participate in society in the post-retirement years by developing network of online knowledge sharing and community. The current project is financed by the European Commission EU-Ambient Assisted Living (AAL) Joint Programme “ICT based solutions for Advancement of Social Interaction of Elderly People.” The main objective of SENIORENGAGE is to provide a tool by which seniors and new professionals may network with each other. SENIORENGAGE platform will allow senior professionals to continue their professions by mentoring younger generations through shared knowledge and expertise. Seniors will also be able to continue to be in contact with their profession by interacting with other seniors from their field and to form interest groups based on e.g. hobbies and professions. SENIORENGAGE platform is made up of two main modules with the aim to promote intergenerational education and cooperation. An E-learning tool will deliver a step-by-step course on the basics of use of the Internet and a Professional Self-Worth Network will allow senior professionals to continue their professions. **Keywords:** Demographics; Social; E-learning.

**SENIORS’ PLAYGROUND AND PHYSICAL ACTIVITY: PERCEPTIONS AND PRACTISES**

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**Objective:** The seniors’ playground was created for elderly people in order to promote physical activity in this age group and therefore an active aging. This study aims to explore the elderly perception on the seniors’ playgrounds, see how this population uses these structures, the reasons that lead them to use it and their practices. **Methodology:** This is a descriptive research and the process of selecting the sample group was non-probabilistic and for accident. The sample consists of 60 people, 30 of which are users of seniors playground and 30 nonusers. The study was developed in two parks situated at Aveiro district (Cacia
and Gafanha da Nazaré) and the methods of data collection were the questionnaire and non-participant observation. **Results:** It was found that the elderly who use the playground, most do it occasionally, driven by improved health and physical condition. It could be once a week or even once a year. They don’t show a routine. It was also found that the questioned elderly that use those playgrounds, most stay there 6–20 min. On the other side, the most elderly who doesn’t use the senior playground it’s because they don’t identify with the type of equipment. We also found that the people observed were mostly children and adults. At the group of 129 observed persons, only 8 of them were older adults. **Conclusions:** The perception of the elderly, which consist the sample, about the seniors’ playground is quite positive; however, it seems that they don’t use it too much. According to the answers, seniors don’t use the equipment very often and don’t remain too long. **Keywords:** Playground; Physical Activity; Perceptions; Seniors.

**LAGOS MUNICIPALITY PROGRAMME: EUROPEAN YEAR FOR ACTIVE AGEING AND SOLIDARITY BETWEEN GENERATIONS**

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The municipality of Lagos will get involved in European year with a transversal programme of activities for promote active ageing and solidarity between generations. The first step was the constitution of a work team from several areas (sports, urban environment, education, social communication, Red Cross delegation, social assistance). This team will prepare the open day programme with a symposium and a participation of all the institutions that work with or for the elderly people and children. The second step was the promotion of a workshop of using the computer and the web for the elderly because all the activities information will be online. There is a website created by a municipality programme to everyone who wants to get active up to forty years old that was explained at the workshop (www.saudeemmovimento.org). The presentation will show the results of the programme and how people from Lagos get involved. An active municipality in a shining environment where everyone was taken into account. **Keywords:** Active Ageing; Generations; Municipality.

**HAND GRIP ENDURANCE CANNOT BE USED AS A SURROGATE FOR QUADRICEPS ENDURANCE IN HEALTHY YOUNG ADULTS**

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**Background:** Grip strength has been widely used as an indicator of whole body muscle strength but knowledge of grip endurance is lacking. Grip strength is known to decline more slowly than lower limb strength with ageing. Comparison between upper and lower limb muscle endurance has received little attention. The present study investigated the endurance of handgrip and quadriceps in young adults prior to studying the effects of ageing. **Methods:** Twenty-one healthy participants (13 males and 8 females) aged between 18-35 years (mean 23.5; SD± 1.4) were studied. Endurance testing consisted of 12 maximal intermittent contractions of 3 seconds duration, separated by 5-second rest periods. A Biodex isokinetic dynamometer and a Jamar dynamometer were utilised to measure quadriceps and grip endurance respectively. Fatigue index values were calculated for both muscle groups by: peak force of contraction 1 minus contraction 12, divided by peak force of the first contraction multiplied by 100. A repeated measures analysis of variance was used to document the
decline in force. Post hoc analysis by Bonferroni testing was used to identify where significant differences occurred. **Results:** Quadriceps and grip strength showed a significant decline in force during the 12 repetitions ($p < 0.05$). The most significant decline occurred on the 8th repetition ($p = 0.049$) during the quadriceps test and on the 2nd repetition ($p = 0.015$) during the grip test. Grip showed a higher mean fatigue index of 28.6% in comparison to that of quadriceps (18.1%). **Conclusions:** Grip showed a more rapid rate of fatigue than quadriceps during a maximal contraction protocol, which is a clinically feasible method of assessment. Studies of submaximal contractions and comparison with older participants are needed. The present findings indicate that caution is warranted when using grip measures as a surrogate for lower limb muscle function. **Keywords:** Endurance; Young; Dynamometer; Quadriceps.

**INTEGRATION OF AN AUTOMATIC INDOOR AND OUTDOOR ACTIVITY MONITORING WITH A SOCIAL NETWORK**

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Loneliness and insecurity are major motives that contribute to a decrease in independence while ageing. This work aims to develop a support mechanism for situations when an elder reaches unsafe geographical areas and need to contact his/her trusted persons, integrating sensor information within a dedicated social network. This integration will allow the provision of Informal Care services to elderly people and promote a more independent live. The general concept is to follow the person’s location based behavior, using the sensors on his mobile device and various hotspots in his/her social environment, and provide relevant information to a selected group of people within the elder social network. The secure GPS-based outdoor support functionality is automatically enabled, to guide the user until his/her destination. The trespassing of pre-determined areas, previously indicated as being safe will trigger an alarm event that is broadcasted to the social network, alerting all the contacts in a list of emergency contacts. The indoor tracking will be made using Wi-Fi and Bluetooth. In case of an alert, the automated decision making functionality request each emergency contact position and availability, and notify the other contacts and the elder about who should provide the required assistance. In terms of technical impact, the work addresses the challenge of providing a distributed system that targets a collaborative behavior between mobile agents in case of an alarm situation is triggered. A key contribution of this solution is the ability to merge together the three dimensions of mobile, social, and sensing streams to generate a highly context-aware output. Attending to the social aspects, the use of ICT technology enhance the quality of life for older individuals who would otherwise lead solitary and inactive lives at home. The adoption of such a monitoring system could increase the elder independence and provide reassurance of safety conditions for the caregivers. **Keywords:** Measurement of Activity; Independence; Social Network; Technology.

**RISK COMMUNICATION AND RISK PERCEPTION: BEHAVIOR OF THE AGING SOCIETY IN THAILAND**

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This study aims to clarify the approach to educate and prevent potential risks to Thai elders through the risk communication process on health risk and disaster risk of floods. The main objective of this study is to analyze relationships between the risk communication channels and risk perception and behaviour of the elderly, who lives in different areas; rural communi-
ties, urban communities, and slum communities. Methods of research used qualitative and quantitative research through a questionnaire survey based on a random sampling technique with 125 elder respondents and an interview with other 208 respondents, who were involved in risk communication. The results showed that Thai elderly had learnt about risks through communicating with family rather than with mediated communication, community activities and neighbours. The current risk communication processes were effective at raising awareness of Thai elders moderately, whereas the elderly was aware of disaster risk relatively low level. Nevertheless, the most effective risk communication channel for raising awareness and motivating the elderly to perform protection measures was the communication through social network contagion approach in the neighbourhood and community level. To enhance awareness and stimulate the motivation to reduce risk, the development of risk communication among the elderly should be based on the participation of the community prevailed.

**Keywords:** Risk Communication; Urban; Rural; Perception; Thailand.

**OLDER WOMEN AND THEIR PARTICIPATION IN SPORTS AND RECREATIONAL PHYSICAL ACTIVITY: ENABLERS, BARRIERS AND THE ROLE OF WORK**

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This study contributes to the wider policy debate that is concerned with the promotion of active ageing and the extension of working lives. These policy aims have gained prominence in many industrialised countries because of population ageing. Within this context, the research explores the factors that enable, motivate, and constrain the participation of older women in sport and other physical recreational activities. In this investigation, the role of employment is given particular attention. Theoretical considerations suggest that there are potentially both positive and negative links between participation in activity and participation in paid work. These relationships are explored using both quantitative and qualitative methods. The quantitative analysis uses data from 18 waves of the British Household Panel Survey and three Sport England Active People Surveys. The qualitative research involved interviews with key stakeholders and women in their 50s, 60s, and 70s. The research confirms that in most cases participation in recreational activity declines with age and is negatively related to participation in employment but there are exceptions. The strength and direction of these relationships varies according to factors such as type of employment, reason for not working and level and type of activity. Gender and gendered roles such as caring are also a factor as are psychological aspects linked to age. These findings suggest that the attitudes of older women toward physical activity are complex and individualised. They are shaped and influenced by a range of factors incorporating psychological, social, environmental, and economic aspects. **Keywords:** Sports; Physical Activity; Barriers; Work.

**GERONTOLOGICAL REHABILITATION IN FINLAND: REHABILITATION GOALS OF ELDERLY CLIENTS WITHIN AN ICF CONTEXT**

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**Introduction:** The study focuses on a R&D project, funded and coordinated by the Social Insurance Institution of Finland (IKKU 2009-2012), which involves 60 rehabilitation courses (à 8 clients, 74+), 6 rehabilitation centres and 21 municipalities. The multidisciplinary gerontological rehabilitation was intended to maintain functioning and enhance the inde-
pendence, meaningful living of older inhabitants in home settings, and their participation in society. The focus of project was to enhance the client-centred approach to treating the elderly by supporting an individual professional tutor and a peer client group. There are I-III study parts in the project. Aims (Study II): The first aim was to analyse the effectiveness of multidisciplinary gerontological rehabilitation by using the scale of an applied GAS method (Goal Attainment Scaling). The second aim was to analyse how the intervention goals for older clients are covered by using the ICF classification (WHO 2001). Data and Methods: Sample of 126 clients participated in 18 courses, took place in six centers at three different periods of time in 2009-2012. The content analysis was done by Cieza et al. (2002) based on the ICF classification. Results: According to the preliminary results, approximately 75% of clients reported they met their rehabilitation goals fairly well, well or very well during the rehabilitation process, lasted one year and entailed three assessment points using an applied GAS scale. The rehabilitation goals were covered mainly by levels of the ICF classification. Conclusion: Older Finnish inhabitants who live in their homes have multi-dimensional rehabilitation needs including risks to their health, functioning, and participation. The preventive rehabilitation is effective when the rehabilitation goals are formulated by the clients themselves. In the future client-centred, goal-oriented gerontological rehabilitation must be facilitated with innovative rehabilitation procedures and products. Keywords: Gerontology; Rehabilitation; Goals; Finland.

OBJECTIVE AND SUBJECTIVE EVALUATION OF SELECTED FORMS OF PHYSICAL ACTIVITY OF OLDER PEOPLE

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Introduction: Accurately measuring physical activity is a complex task. Although self-reported PA and subjective methods are useful in research that involve large number of people but in the group of elders they are not always reliable. Health status, mood, depression, and fear have big impact on answers. There is growing use of devices to measure physical activity. The purpose of this study was to evaluate four forms of physical activity for older people that are most popular in Poland ¨C Nordic Walking, gymnastic, Tai Chi and dance.

Material and methods: In the study participated seniors from University of Third Age (Jozef Pilsudski University of Physical Education, Warsaw) with the age ≥ 60 years old. The study involved three devices: IDEEA, ActiGraph GT3X+ and SenseWear Pro3 Armband. The measures with the use of devices were done during classes and all participants evaluate them with the 20-point Borg Scale. Results: The forms of physical activity differ a lot in the subjective and objective evaluation. The highest values of all parameters measured were reached during Nordic Walking and the lowest during Tai Chi. Summary: There is a need to define, which of the form proposed for elderly is the best for keeping them independent in everyday life. Measures should be done on bigger group and on other forms of physical activity that are recommended for older people. Keywords: Physical Activity; Evaluation; Objective; Nordic Walking; Tai Chi.

LIFESTYLE AT MIDLIFE PREDICTIVE OF INDEPENDENT LIVING AT OLD AGE?

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Objectives: We investigated the role of lifestyle factors at midlife in relation to independent living at old age in a cohort study with a follow-up time of 21 years. Setting and Participants: The study population was a random subcohort from the Netherlands Cohort Study (NLCS) aged 55-69 years at baseline in 1986 (n = 4405). Measurements: Independent living was assessed as: 1) ability to perform activities of daily living (ADLs) assessed in 2000, and 2) use of formal care (home care, institutionalized care), obtained through linkage with a nationwide insurance-based care registry, available for 2004-2007. Lifestyle (diet, physical activity, smoking, and BMI), age, education, and presence of chronic diseases (all measured in 1986) were used as independent variables in logistic regression with outcomes well-functioning and non-use of permanent formal care. Results: For men, current smoking was the only statistically significant lifestyle factor to reduce functioning (OR: 0.43, 95%CI: 0.32-0.58). In women, current smoking (OR: 0.64, 95%CI: 0.44-0.94), being overweight (OR: 0.77, 95%CI: 0.62-0.96) or obese (OR: 0.30, 95%CI: 0.18-0.48) reduced functioning, whereas physical activity (p trend 0.03), dietary saturated fat (OR per en% fat: 1.04, 95%CI: 1.01-1.08), and fruit consumption (p trend 0.01) enhanced functioning. Current smoking enhanced use of care in men (OR: 0.47, 95%CI: 0.32-0.70) and being an ex-drinker in women (OR: 0.34, 95%CI: 0.13-0.94). Adding ADL as independent variable did not change the ORs of the lifestyle variables, although having problems with ADL enhanced care use in men (OR: 0.57, 95%CI: 0.40-0.82) and women (OR: 0.39, 95%CI: 0.29-0.53). Conclusion: Not smoking is the main determinant of independent living in men, even after adjustment for chronic disease. In women, other lifestyle determinants besides smoking, i.e. physical activity, diet and BMI are also important. Keywords: Lifestyle; Independent; Smoking; Physical Activity.

ADHERENCE TO PHYSICAL EXERCISE RECOMMENDATIONS IN PEOPLE OVER 65: THE SNACKUNGSHOLMEN STUDY

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Purpose: To assess participation in health and fitness-enhancing exercises in people aged over 65, and to explore whether the possible differences in meeting current recommendations by age, gender and education could be explained by health status, lifestyle and physical performance. Methods: The study population was derived from the Swedish National study on Aging and Care, and consisted of a random sample of 2593 subjects, aged 65+ years. Baseline data were collected between 2001 and 2004. Participation in health- and fitness-enhancing exercise according to the WHO and the American College of Sports Medicine’s recommendations in relation to demographic factors, health- and life-style factors, and physical performance was evaluated using multinomial logistic regression. Results: According to the recommendations, 46% of the participants fulfilled the criteria for health-enhancing and 17% for fitness-enhancing exercises. Advanced age and low education were negatively related to participation in both health and fitness-enhancing exercise independent of health and life style factors. Walking speed explained the association between age and health-enhancing exercise as well as between education and fitness-enhancing exercise. Conclusions: The majority of the participants aged 65+ did not meet the recommended level of exercise. Promoting physical exercise and encouraging participation, especially among older subjects, lower educated and with initial functional decline as shown by slow walking speed may help to reduce adverse health outcomes. Keywords: Adherence; Exercise; Demographic; Function.
ISSUES IN PHILIPPINE AGING POPULATION (WITH COMPARATIVE NOTES ON JAPAN)

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Introduction: In developing countries, like the Philippines, identifying present issues and problems among older persons (OPs) are of significance to better address their needs (specifically on physical activity promotion and leisure) and as bases for institutionalizing directions and strategies. Further, learning from the experiences of advanced countries like Japan could assist leaders on the nature and content of programs toward active aging.

Methods: Research situ was Sariaya Quezon (rural) and Quezon City (urban) with data gathered in 2009 on policies, activities and services (interview, ethnographic observations, visitations); leisure activities (questionnaire); functional fitness tests. Comparative notes on Japan applied similar methods (in 8 districts). Results: As primary source of care is the home Filipino OPs generally engage in light PA around one’s abode with few communities providing for the leisure time needs of the OPs (generally social in nature due to lack of physical activity leaders). More involved in ADL the rural OPs have higher levels of functional fitness. Community services are centered on primary medical needs. Day cares and homes are available only to those who are financially independent. These and a dearth on information regarding different aspects of healthy lifestyle maintenance, limitations in active aging organizational process and structure in the Philippines are notable. In contrast, in Japan (with its institutionalized policies and guidelines), varied programs and services to maintain and improve the quality of life of older persons in communities are realized.

Conclusion: Population aging demands a national policy that should specifically state in its service delivery the need to institutionalize leisure education and leadership towards active aging. A holistic OP program with basic benefits and services from medical to recreational needs, IEC campaign and a coalition of stakeholders (with PA specialists) is needed.

Keywords: Rural; Urban; Philippines; Quality of Life; Active Aging.

STRATEGIES TO REACH AND RECRUIT SEDENTARY OLDER ADULTS WITH A LOW SOCIOECONOMIC STATUS

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Background: A low socioeconomic status is related to unhealthy lifestyle characteristics and health disparities. However, these target groups are difficult to be recruited for interventions and intervention studies. Therefore, appropriate and effective strategies are needed to reach and recruit older adults with a low socioeconomic status for participation in lifestyle changing interventions.

Methods: We combined multiple strategies to recruit sedentary older adults (>64 years) in a low socioeconomic neighborhood. Aim of this recruitment strategy is to reach all sedentary older adults, including social isolated and care avoiding older adults and to recruit as many as possible in our intervention study. First, older adults (n = 719) received a letter with an invitation to participate in the intervention program. Secondly, these older adults were visited at home. During these door-to-door visits, sedentary older adults were selected and informed about the project. Thirdly, a back door method was used: key peers from the neighborhood helped to make contact. Finally, a network method was used to recruit sedentary older adults: local professional organizations, like churches, social welfare
organizations, primary care and home care organizations, and ethnic associations, referred subjects. **Results:** In total, 719 older adults (>64 years) received a letter with an invitation to participate in the intervention program. Overall, 422 persons were visited at home. During these home visits, 80 older adults declared to participate (seven persons withdraw after registration). By use of the back door and network method, 30 older adults were recruited. In total, by the use of the multiple recruitment strategy, 14.3% of the announced elderly participated in the intervention program. **Conclusion:** A multiple recruitment strategy seems beneficial to recruit sedentary older adults in deprived neighborhoods for lifestyle changing interventions. **Keywords:** Sedentary; Socioeconomic; Intervention; Deprivation.

SELF-REPORTED HEALTH AND EDUCATION ARE ASSOCIATED WITH HIGHER PHYSICAL FITNESS IN ELDERLY PEOPLE

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**Introduction:** ageing process is accompanied by a decrease of physical fitness levels. The latter may lead to reduced quality of life among elderly people. This study aimed to identify potential factors for having good levels of fitness in order to develop future strategies to guarantee a successful aging. **Methods:** 724 men and 2412 women (aged 72.2±5.3) were evaluated in Spain within the framework of the elderly EXERNET multi-centre study. A structured validated questionnaire was performed in all subjects. Education level and self-reported health variables were included in this report. The first one was classified into: higher education (including university studies and secondary school) and low education levels (primary school and non-educated people), whereas EQ5D questionnaire was used to assess the health related quality of life. Lower-body strength, agility, walking speed and endurance were evaluated using four different test modified from the Senior Fitness Test and Eurofit Testing Batteries. Three different categories were created for each fitness test based on the calculated scores. Age-adjusted logistic regression was applied to study the probability to have better results of fitness depending on the education level and/or health perception. **Results:** For men and women together, better perceived health was associated with higher physical fitness performance (highest tertile) by 2.5, 2.6, 2.4 and 2.5 times, lower-body strength, agility, walking speed and endurance, respectively (95% CI [(2.043-3.071); (2.073-3.153); (1.905-2.924) and (1.998-3.056)]). In women, the odds ratio of having higher levels of fitness was increased by 18, 58, 108 and 65% in those with higher education levels while in men the odds ratio were increased by 6, 65, 126 and 37% (respectively in the mentioned physical fitness test). **Conclusion:** An enhanced subjective health perception and higher education levels seem to be associated to better physical fitness levels among elderly people. **Keywords:** Fitness; Education; Quality of Life; Perception.
BREATHING EXERCISES IN THE PREVENTION AND SELF MANAGEMENT OF THE CONDITIONS ASSOCIATED WITH OLD AGE

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Agarwal Health Center, United States

Introduction: Pulmonary function, as measured by spirometry (FEV1 or FVC), is an important predictor of morbidity and mortality in elderly persons. It is independent of gender or smoking history. Yoga has been practiced in India for more than 5000 years and is gaining increasing popularity in the West. Commonly performed yoga exercises include asanas (physical postures), pranayama (breathing exercises), and meditation. This poster illustrates several easy to perform breathing exercises that should improve lung function in the elderly.

Methods: Several breathing techniques were reviewed from yoga texts and other publications on PubMed. Seven simple breathing exercises with the most benefit, ease of learning and general safety for seniors were picked for this poster presentation. Results: The following seven breathing techniques may be beneficial for the elderly. Except for pursed lip breathing, the rest are well described in the yoga texts. These exercises will be described in more detail, including their mode of performance and benefits in the poster: 1. High, middle, and low (complete) breathing 2. Alternate nostril breathing 3. Pursed-lip breathing 4. Humming breathing 5. Step breathing 6. Meditative breathing 7. Peaceful breathing. Conclusion: Decreased pulmonary function, as evidenced by a reduced FEV1, is an independent marker for cardiovascular mortality. The breathing exercises listed above are simple to learn, easy to perform and virtually free of any harmful effects. Their practice has been associated with excellent adherence. Regular performance of these exercises will help improve pulmonary function in the elderly. Keywords: Breathing; Yoga; Pulmonary Function; Cardiovascular.

MEDITATION IN THE PREVENTION AND SELF MANAGEMENT OF THE CONDITIONS ASSOCIATED WITH OLD AGE

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Agarwal Health Center, United States

Introduction: Meditation is a part of religious and spiritual traditions of many ancient cultures. It has been practiced for thousands of years in the East. Its popularity in the West has steadily grown mainly because of its ability to impart mental calmness and induce physical relaxation. Meditation involves using certain techniques, including specific postures and focused attention, resulting in psychological balance. However, during the past several decades, a number of scientific studies have emerged documenting major cardiovascular and other benefits associated with its practice. Methods: All recent abstracts and articles on meditation and medical diseases available on PubMed and other reference sites were reviewed. Meditation techniques of clinical practicality were picked up for this poster presentation. These techniques will be addressed in detail in the poster. Results: The following five simple meditation techniques are easy to perform by seniors 1. Flame Focus Meditation 2. Deity Focus Meditation 3. Chanting Meditation 4. Prayer Meditation 5. Breath Meditation 6. Bead Meditation Side effects: There are rare cases of worsening of psychiatric problems in known mental patients. Conclusion: The practice of meditation has many potential health benefits. There is an improvement in high blood pressure, reduction of atherosclerosis and an improvement in life quality in patients with chronic heart failure. There is a reduction in total cardiovascular, cancer and general mortality with its practice. It improves psychologi-
cal balance. Meditation is easy to learn and perform. There are no known adverse effects. 

**Keywords:** Meditation; Self-Management; Cardiovascular.

**PROPRIOCEPTION AND FUNCTIONAL DEFICITS OF PARTIAL MENISCETOMIZED KNEES IN ACTIVE MIDDLE-AGED PEOPLE**

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**Purpose:** The purpose of the present study was to assess the proprioception and muscle function of the partial meniscectomized knee through balance and functional tests at least 12 months posterior to arthroscopic surgery in active middle-aged people. **Methods:** Twenty-six patients who fulfilled the inclusion criteria participated in the study. All patients performed balance and functional tests. On the balance system recorded the deviations from the horizontal plane, on the balance boards their performance was timed, and at the functional test triple jump their performance recorded in meter. One-way ANOVA used to determine significant differences between the healthy and injured limb. The level of statistical significance was set at p < 0.05. **Results:** The results revealed significant differences (p < 0.05) between the healthy and injured limb at all balance and functional tests performed. The present study demonstrated that 1-2 years after partial meniscectomy active middle-aged patients had reduced proprioception and knee muscular ability in the operated leg compared with the non-operated leg. **Conclusions:** It is concluded that these deficits significantly affect objective knee function, indicating the importance not only of the restoring muscle function but also of the proprioception ability in partial meniscectomy middle-aged patients. **Keywords:** Proprioception; Meniscus; Balance; Function.

**AQUATIC THERAPY VERSUS CONVENTIONAL LAND-BASED THERAPY FOR ACTIVE MIDDLE-AGED PATIENTS WITH A PARTIAL MENISCETOMIZED KNEE**

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**Purpose:** The purpose of the study was to investigate the effectiveness of two different functional training programs (land versus water) on balance, strength, and functional ability in meniscectomized arthroscopic active middle-aged patients. **Methods:** Thirty-six partially meniscectomized active middle-aged patients (after 1-2 years) were randomly divided into three groups, twelve individuals in each. One subject group underwent no specific training (control group). The remaining two groups followed two different intervention functional programs for 12 weeks, 3 times per week, 50 min per session. One of the two training groups performed the functional program out of the water (land-based) and the other in the water (water-based). Before the beginning and after the completion of functional programs, all subjects performed a) balance tests on the balance system (deviations from the horizontal plane) and balance boards (time on balance), b) strength test (quadriceps and hamstrings peak torque) and c) functional test; triple jump. **Results:** According to the two-way repeated measures ANOVA (3x2), in the Control group no difference (p > 0.05) was found between pre-training and post-training of the injured leg. In contrast, in the Land-based and Water-
based groups, both functional training programs on the injury leg improved \( p < 0.01 \) all the performance indicators examined. The Paired-samples t-test indicated that in post-training for both training groups (Land-based and Water-based) no differences were found between the injured and healthy leg \( p > 0.05 \).

**Conclusions:** it seems that knee functional exercise programs are essential to active middle-aged meniscectomized patients. Both Land and Water-based exercise programs almost equally cover any knee functional deficits. **Keywords:** Aquatic Therapy; Land-based Therapy; Meniscus; Balance; Strength.

**BLOOD-BORNE BIOMARKERS OF MORTALITY: A SYSTEMATIC LITERATURE REVIEW OF PROSPECTIVE COHORT STUDIES.**

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**Background:** Lifespan and the proportion of older people in the population are increasing, with far reaching consequences for the social, political, and economic landscape. Unless accompanied by a simultaneous increase in health span, the associated increase in age related disease will burden health care resources. Physical activity intervention can be used to improve health span. The LiveWell Programme is an ongoing research programme which aims to develop lifestyle interventions to promote health and wellbeing in later life. Intervention studies need appropriate outcome measures and blood-borne biomarkers are potential outcome measures for such interventions because they are easily obtainable, cost-effective, and are widely accepted tools in clinical practice. There have been no previous systematic reviews of blood-borne biomarkers of longevity. **Aims:** To conduct a systematic literature review to identify blood-borne biomarkers of longevity which could be used as outcome measures for LiveWell and other physical activity interventions. **Methods:** A rigorous search strategy was devised. Four databases (Medline, Embase, Scopus, Web of Science) were searched for suitable prospective cohort studies and 9 which fulfilled the selection criteria were accepted for data extraction. Quality of the studies was assessed using the Newcastle-Ottawa Scale. **Results:** Higher levels of C-reactive protein (CRP; \( p < 0.001 \)), non high-density lipoprotein cholesterol (non HDL-C; \( p < 0.05 \)) and N-terminal pro-brain natriuretic peptide (NT-proBNP; \( p < 0.001 \)), and lower levels of high-density lipoprotein cholesterol (HDL-C; \( p < 0.02 \)) predicted mortality risk. **Conclusions:** These biomarkers should be considered for use as outcome measures in future physical activity intervention studies. The low number of studies found highlights the need for further biomarker research using standardised protocols and reporting methods. **Keywords:** Biomarkers; Mortality; Physical Activity.

**THE ASSOCIATION OF DISABILITY AND CO-MORBIDITY WITH FRAILTY**

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Frailty, disability, and co-morbidity clearly are linked. Even so, some researchers recommend against including disability and co-morbidity as frailty markers. Others recommend against excluding items of the frailty definition a priori, as long as each item increases with age and is associated with adverse outcomes. Examining how frailty, disability, and co-morbidities co-occur remains to be elucidated. **Purpose:** To estimate the proportion of frail participants experiencing disability and co-morbidities and to examine whether such items should be included in the Frailty Index (FI) in order to predict mortality risk. **Methods:** 2305 community-dwelling adults (874 men, 1431 women) aged 65+ from the second
wave of the Canadian Study of Health and Aging comprised the study sample. Frailty was
defined using both the frailty phenotype and the FI. Following a standard procedure, two
37-items FI were constructed. One version included disability and co-morbidity items, the
other excluded them. Results: The proportion of frail participants who had neither disability
nor co-morbidity was 3.6% and 8.6% when the frailty phenotype and the FI approaches
were used, respectively. At least 98% of the participants with a FI score less than 0.07 did
not experience disability and more than 98% of participants with a FI score more than 0.52
experienced disability. Bathing was the activity which became impaired first with increasing
frailty. When both FIs were included into the same regression model to evaluate survival,
the hazard ratio per 0.1 increase in FI score was 1.19 (95% CI: 1.09-1.29) when disability
and co-morbidity were included in the index. The index which excluded disability and co-
morbidity did not add anything to the prediction of mortality. Conclusions: Most frail adults
experience disability and co-morbidity and these two concepts contributed to the ability of
the FI to predict survival. Keywords: Disability; Co-morbidity; Frailty.

DETERMINANTS OF IMPLEMENTATION OF FUNCTIONAL TASKS EXERCISE
PROGRAM FOR OLDER ADULTS

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Objectives: The functional tasks exercise program (FTE) is the first program with sustain-
able improvement on physical capacity merely because it is adapted to daily activities of the
elderly. The introduction of new programs is complex require a detailed understanding of
impeding and enhancing factors – determinants –for designing implementation strategies.
We studied the determinants the national implementation of FTE for community dwelling
elderly. Settings and Participants: primary care physical and remedial therapists and elderly
people (64 years and older). Methods: Focus(group) interviews with 20 therapists and 8
elderly and subsequently a questionnaire study among a random sample of 100 therapists
(77% response). Determinants were classified into four categories referring to characteristics
of the environment, the organization, the therapists and elderly, and the training program.
Results: Critical determinants related to the environment and organization were: the recruit-
ment of sufficient elderly that are suitable for the program; financial reimbursement for
the therapist for providing the training; costs for the elderly. Determinants related to the
therapists and elderly: lack of knowledge and skills to provide the training, self-efficacy.
Furthermore, elderly were unconvinced that they were trainable. Determinants related to
the program: therapists and elderly were enthusiastic about the content and evidence of the
program, however the training frequency (3x a week) was judged to be too high. Conclusion:
we adapted the implementation strategies to the determinants (e.g. adaption of the
training, reimbursement, and strategies for recruiting and motivating elderly). Currently,
a pilot implementation takes place among 20 therapy practices. At the congress, we will
present the determinant analysis and the preliminary results of the pilot implementation of
FTE. Keywords: Functional; Implementation; Exercise; Therapy.

FRAILTY AS A MULTIDIMENSIONAL CONSTRUCT: VALIDATION OF THE
GRONINGEN FRAILTY INDICATOR

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Froukje2; Krijnen,Wim P.1; van der Schans, Cees P.1
Background: The Groningen Frailty Indicator (GFI) is a widely used self-report screening instrument to identify frail older adults. Frailty is suggested to be a dynamic and multidimensional construct. However, factor structure of the Groningen Frailty Indicator has not been examined yet. Objective: To evaluate the factor structure and validity of the 15-item Groningen Frailty Indicator questionnaire. Methods: Older adults aged 65 years and over (n = 1401) completed the GFI. A subsample of 120 older adults completed additional questionnaires (De Jong Gierveld loneliness scale, Hospital Anxiety Depression Scale (HADS), RAND-36 physical functioning). Factor structure, internal consistency, construct validity, and criterion-related validity of the scale were evaluated. Exploratory and confirmatory factor analyses were used to evaluate factor structure of the GFI. Results: Factor structure of the GFI provided support for a three dimensional structure of the scale. The subscales Mobility, General health and Psychosocial functioning showed moderate to good internal consistency (respectively Cronbach’s alpha’s: $\alpha = 0.81$, [95% CI = 0.79-0.82]; $\alpha = 0.60$, [95% CI = 0.56-0.63]; $\alpha = 0.80$, [95% CI = 0.78-0.81]). Analyses of construct validity showed significantly higher GFI subscale scores in older age groups, female respondents and institutionalized living respondents than in respondents in younger age groups, male respondents and independently living respondents. Scores on the GFI subscales correlated significantly with related scales: Mobility GFI with RAND36 physical functioning ($r = 0.61$); General health GFI with Rating of health ($r = 0.54$); Psychosocial functioning GFI with De Jong Gierveld scale ($r = 0.71$); Psychosocial functioning GFI with HADS ($r = 0.66$). Conclusion: Present findings support a three dimensional factor structure of the Groningen Frailty Indicator. Three valid and reliable frailty subscales were established to identify frail older adults in different domains of functioning. Keywords: Frailty; Multidimensional; Psychosocial.

REGULAR EXERCISE ASSOCIATED WITH LOWER RISK OF CATARACT INDEPENDENT TO AGING

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Purpose: To investigate the relationship between exercise and cataracts in a Chinese population. Methods: A total of 13,157 subjects were enrolled and divided into cataract and non-cataract groups. The definition of cataracts was clouding of either lens, which includes nuclear sclerosis, cortical opacity, posterior subcapsular opacity, or the presence of mature cataracts. Subjects with a history of cataract extraction were also categorized into the cataract group. Exercise habit was divided into regular ($\geq 3$ days/week), occasional (1-2 days/week), and non-exercise according to exercise status during the previous six months, with a day of exercise being defined as at least 20 min of vigorous physical activity. The Asia-Pacific modification of the National Cholesterol Education Program Adult Treatment Panel III guidelines was used to define metabolic syndrome. Binary logistic regression was used to investigate the relationship between cataracts and habitual exercise, with adjustments for sex, age groups, education level, metabolic syndrome, smoking, and alcohol drinking. Results: A total of 2,572 (19.5%) subjects had cataracts, and women had a higher prevalence of cataracts than men. Both regular exercise (OR: 0.80, $p = 0.03$) and occasional exercise (OR:
0.68, p < 0.001) were negatively associated with cataract. Multivariate analysis showed that female gender (OR: 1.20, p < 0.001), age ≥65 years (OR: 3.8174, p < 0.001), age of 40-64 years (OR: 19.04, p < 0.001), metabolic syndrome (OR: 1.36, p < 0.001), and educational level ≤6 years (OR: 1.86, p < 0.001) were positively associated with cataracts. **Conclusions:** Not only regular exercise but also occasional exercise seems to have a protective effect with regard to preventing cataracts. **Keywords:** Cataract; Exercise; Chinese.

**LOWER-LIMB STRENGTH IS RELATED TO RESPONSE INHIBITION AMONG OLDER WOMEN, INDEPENDENTLY OF AEROBIC FITNESS AND AGE**

Blasco-Lafarga, Cristina; Martinez-Navarro, Ignacio; Valencia-Peris, Alexandra; Roldan, Ainoa; Sanchis, Gema; Cordellat, Ana

*University of Valencia, Spain*

**Introduction:** Executive function has been shown to be associated with gait speed and balance (1), and also with performance in Up and Go test (2, 3). There is a lack of agreement, though, respecting strength; a significant correlation between executive performance and knee extensor isokinetic strength has been described (4), but not between the former and lower-limb isotonic strength (5). Therefore, our purpose was to evaluate whether set shifting and response inhibition, as measures of executive function, were related to lower-limb strength. **Methods:** 19 older women (70.1±4.2 yrs) participated in the study. Lower-limb strength was assessed by the 30-sec chair-stand test (CST) and aerobic fitness measured by the 6-min walk test. Interference score of the Stroop Colour Word Test (SCWT) was used as an index of response inhibition and difference between parts B and A of the Trail Making Test (ATMT) as a measure of set shifting ability. Then, a partial correlation, controlling for age and aerobic fitness, was conducted. Previously, CST and SCWT were logarithmically transformed to meet normality assumptions. **Results:** CST was significantly associated with SCWT (r = -.51; p < 0.05), but uncorrelated to ATMT. **Conclusions:** The relationship found among lower-limb strength and response inhibition ability reinforces previous results from Huh et al. (4). Our stronger correlation (-.51 vs -.11) may be due at least partly to a greater functionality of the protocol employed. Therefore, although the cross-sectional design of the present study prevents us from reaching causal conclusions, our results suggest that performance of lower-limb strength tasks is related to executive function in the elderly, pointing to some shared control processes. Furthermore, this dependence seems to be stronger as motor control demands of the task increase. On the other hand, the discordance with Scherder et al. results (5) might be due to age differences between samples and statistical approach employed. **Keywords:** Strength; Response Inhibition; Aerobic Fitness; Executive Function.

**POSSIBILITIES OF BODY COMPOSITION INFLUENCE BY WALKING PROGRAM IN SENIOR WOMEN**

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**Introduction:** Successful ageing is a process of optimization of opportunities for maintaining good health (physical, social and mental), a process enabling senior citizens to actively participate in social life, without being discriminated against because of their age, and thus allowing them to enjoy a good-quality, independent life. The various methods currently available to assess the effect of physical activity vary greatly in their applicability in research and/or in practice. Usable method for these aims could be the body composition (BC) assessment.
The aim of study was to verify the moving programme based on walking for BC influence in women seniors. **Methods:** The walking with exercise intensity (minimally of 90% was walking) at a level of 50 to 70% VO₂max (HR ranged from 65 to 85% of HRmax or 100-140 beats.min⁻¹) was used in a group of healthy senior women \[ n = 53, \text{ age} = 68.7 \pm 5.0 \text{ yrs, body mass} = 69.9 \pm 7.9 \text{ kg, height} = 161.0 \pm 2.8 \text{ cm, \% of body fat} (\%BF) = 37.5 \pm 5.1\%, \text{ free fat mass} (FFM) = 43.7 \pm 5.5 \text{ kg, body cell mass} (BCM) = 20.6 \pm 2.9 \text{ kg, VO₂max.kg}^{-1} = 25.9 \pm 4.3 \text{ ml.kg}^{-1}.\text{min}^{-1}} \]. The duration of exercise session ranged from 20 to 50 min, and exercise training was performed 3-5 times a week. **Results:** The exercise time ranged between 90-250 min (mean 156.8 \pm 48.9 min), total energy content ranged from 650 to 1780 kcal (950 \pm 230 kcal) per week. After 6 months of training, non-significant body mass increase (0.8 \pm 1.7 kg), \%BF decrease (0.6 \pm 1.5\%), and FFM and BCM increase (0.84 \pm 0.33 and 2.0 \pm 1.7 kg; both \( p < 0.01 \)) was found. Similarly was increased the motor performance - maximal speed of walking by 0.5 \pm 0.3 \text{ km.h}^{-1}; (\( p < 0.01 \)). **Conclusions:** The BC influence by help of walking intervention could significantly improve the senior’s independency. The walking intervention advantage is that may be realized daily without of use of supplementary tools. We may conclude that walking lasting 6 months with total energy content of 950 kcal during a week is enough for significant improvement of BC in senior women.

**PROGRESSIVE RESISTANCE TRAINING IN ELDERLY LIVING WITH HIV**

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**Background:** Elderly people present alterations on body composition and physical fitness, compromising their life quality. Chronic diseases, including HIV/AIDS, worsen this situation. Resistance exercises are prescribed for improving fitness and promoting a healthier and independent aging. **Objective:** This study describes a case-series of HIV positive elderly participating in a progressive resistance training program and evaluates their body composition, muscular strength, physical fitness. **Methods:** Subjects were prospectively recruited for nine months. Training program consisted of 3 sets of 8-12 repetitions of leg press, seated row, lumbar extension and chest press, performed with free weights machines, 2 times/week during 1 year. Infectious diseases physicians followed patients, reporting all relevant clinical data. Body composition was assessed by anthropometric measures and by dual-energy x-ray absorptiometry before and after the training program. **Results:** 14 patients, aged 61-69 years old, of both genders, without regular physical activity and with an average 9 years HIV/AIDS history were enrolled. Strength of major muscular groups increased (74%-122%, \( p = 0.003-0.021 \)), with a corresponding improvement on sit-standing and walking 2.4 m tests (\( p = 0.003 \)). There were no changes on clinical conditions and on body composition measures, but triceps and thigh skinfolds significantly reduced (\( p = 0.037 \)). **Conclusion:** Resistance training increased strength, reduced upper and lower limbs skinfolds and significantly improved physical fitness, without significant side effects.

**USING ACCELEROMETRY TO MONITOR THE PATTERNS OF ACTIVITY IN ACUTE STROKE PATIENTS**

Craig, Louise; Bernhardt, Julie; Wu, Olivia; Langhorne, Peter

1University of Glasgow, UK; 2Florey Neuroscience Institutes, Australia
**Background:** Accelerometry provides a continuous, detailed objective measure of activity levels and patterns. Quantifying activity by total time spent upright or the number of transitions per day may miss important factors such as the time spent in each upright (standing/walking) or sedentary (lying/sitting) episode and the distribution of these events. The aim of this study was to investigate using accelerometry the pattern of daytime sedentary behaviour and upright activity in acute stroke patients. **Methods:** A multicentre observational study design was used. Each recruited stroke patient wore an accelerometer for one day whilst in the acute stroke unit. The length of each upright and sedentary event was determined for all patients and categorised (<5 min, 5–10 min, 10–30 min, 30–60 min, or >60 min). For each time category, the total time spent upright/sedentary was calculated as a percentage of the total time upright/sedentary. **Results:** Sixty-six patients were recruited from 3 hospitals between October 2010 & June 2011. Patient demographics were representative of the local population; with mean age of 73.2 years (SD 9.8) and similar numbers of males and females. The median time from stroke onset to the day of monitoring was 5.5 (interquartile range 4-9 days). The majority of total upright time was the result of short episodes of <10 mins upright activity. The opposite pattern was observed for sedentary events whereby the majority of total sedentary time was accumulated by prolonged episodes of >60 mins sedentary behaviour. **Conclusion:** This study revealed low levels of upright activity; however, the prolonged sedentary events may be more cause for concern. Rehabilitation should be focused on reducing these inactive periods rather than overall activity. Accelerometry can provide a fuller picture of the patient’s pattern of activity and a baseline measure which could be used to inform the design and implementation of future rehabilitation interventions.
Friday 17th August 2012
Day Theme: Cardiovascular and Respiratory Conditions

Plenary Keynotes

PHYSICAL ACTIVITY, CARDIOVASCULAR FUNCTION AND HEALTH
Buckley, John
Department of Clinical Sciences, University of Chester, UK.

In the past two decades, the mortality rate from cardiovascular disease (CVD) in many Westernised countries has been halved. Yet the number of people living with the burden of CVD has not changed and is showing signs of increasing. With increased survival rates, coupled with an ageing population, the management of CVD needs to be delivered in a manner to prevent unnecessary costly hospital re-admissions for both acute coronary events and heart failure. In addition to exercise helping to reduce or manage bio-medical risk, it is increasingly playing a vital role in sustaining quality of life and prevention of co-morbid disability that often transpires either coincidently or as a result of acute cardiovascular events. This presentation aims to highlight the vital role that physical activity and exercise play in the physical, social, and psychological elements of chronic CVD management that is increasingly prevalent in the Western World’s ageing population.

SEDENTARY BEHAVIOUR AND OLDER PEOPLE: NEW INSIGHTS
Owen, Neville
Behavioural Epidemiology Laboratory, Baker IDI Heart and Diabetes Institute, Australia.

As people age, most become physically less active. Health promotion initiatives generally focus on moderate-to-vigorous physical activity or specific forms of exercising for health. However, older people can also spend a great deal of their time sitting. New evidence points to too much sitting as a distinct health risk, which is additional to the more well-known deleterious consequences of too little physical activity. This presentation will provide an overview of what is known about how too much sitting can be bad for health; what is known about how much sitting older people do; why prolonged sitting is so common; and, the feasibility and likely benefits of reducing and breaking up prolonged sitting time. Findings from recent research in Australia will be highlighted, with suggestions about the type of beneficial changes that older adults might make to their patterns of time spent sitting and being physically active. However, changing sitting time is not simply a matter of discretionary individual choice and personal initiative. Serious consideration also needs to be given to
the environmental and policy initiatives that are most relevant for older adults and to the advocacy strategies that are needed.

Symposia

PERSISTENT PAIN IN OLDER ADULTS: A BARRIER TO ACTIVE AGEING.

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Many older people experience persistent pain, which, if poorly managed, can reduce their physical activity levels. This seminar will address the extent, nature, and impact of the problem. Interventions for managing persistent pain, tailored to older adults and targeted at increasing physical activity, will also be discussed.

Chronic musculoskeletal pain contributes to mobility decline and disability in an older population: The MOBILIZE Boston Study.

Leveille SG\(^1,2,3\), Eggermont LHP\(^4\), Kiely DK\(^5\), Jones RN\(^2,4\), Shmerling RH\(^2,3\), Guralnik JM\(^6\), Bean JF\(^2,7\).

\(^1\)University of Massachusetts Boston, Massachusetts, USA; \(^2\)Harvard Medical School, Boston, Massachusetts, USA; \(^3\)Beth Israel Deaconess Medical Center, Boston, Massachusetts, USA; \(^4\)Vrije University Amsterdam, The Netherlands; \(^5\)Hebrew SeniorLife, Boston, Massachusetts, USA; \(^6\)University of Maryland, Baltimore, Maryland, USA; \(^7\)Spaulding Rehabilitation Hospital, Boston, Massachusetts, USA.

Introduction: Chronic musculoskeletal pain is associated with mobility limitations and disability but few studies have examined the disabling impact of chronic pain over time in older adults. Aims: The purpose of this study was to examine the relationship between chronic pain and risk for onset or worsening of mobility difficulty and ADL and IADL disability in an older population. Methods: The MOBILIZE Boston Study, a population-based longitudinal study, enrolled 765 community-living adults aged >70y. Participants were assessed at baseline and 18 months. Chronic pain was measured using a 13-item join pain assessment and the Brief Pain Inventory (BPI). Disability in mobility (walking and stair climbing), activities of daily living (ADL), and instrumental ADL (IADL) was defined as having a lot of difficulty or inability in these activities. We used multivariable logistic regression models to determine the relationship between baseline pain and subsequent disability. Results: At baseline, 64% of participants had chronic musculoskeletal pain. While 8% of persons without pain had mobility difficulty, 26% of those who had multisite pain and 33% of those with widespread pain had mobility disability. The onset of new or worsening disability at 18-months was consistently associated with more sites of pain and more severe pain at baseline. After multivariable adjustment for sociodemographics, chronic conditions, and medications, the relative risk for developing new or worsening mobility disability was 2.33 (95%CI 1.36-3.98) for those with widespread pain and 1.99 (1.22-3.24) for those with multisite pain, compared to persons with no pain. Similar associations were observed for ADL and IADL disability. Discussion: In conclusion, chronic pain distribution and severity were consistently associated with increased risk for new or worsening disability. Greater
attention to prevention and management of chronic pain may reduce disability in the older population. **Keywords:** Pain; Musculoskeletal; Mobility; Disability.

**Physiotherapy and occupational therapy students’ likelihood to recommend physical activity for managing persistent low back pain: Is an older person likely to be advised differently than a younger person?**

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1Institute of Health and Social Care, Teesside University, UK. 2School of Health and Social Care, University of Greenwich, UK.

**Introduction:** Older adults with persistent low back pain (LBP) may receive sub-optimal management due to the ageist attitudes of health care professionals (HCPs). **Aims:** The aim of this study was to compare HCP student’s consistency with physical activity guidelines for an older person with LBP to a younger person with LBP. **Method:** UK Physiotherapy and Occupational therapy students randomly received an online vignette of a 40 year-old (younger vignette) \( n = 38 \) or 70 year-old (older vignette) \( n = 39 \) patient with persistent LBP. Other than the patient age, vignettes were identical. The participants reported how they would advise that patient about work, exercise, daily activities, and bed rest. **Results:** There were no significant difference in overall desirable physical activity recommendations between the younger and older vignette \([63\% \text{ vs. } 59\%]; \text{OR}(95\%CI) = 1.27(0.45-3.55, p = 0.65)\) or for of the sub areas of work \([90\% \text{ vs. } 82\%]; \text{OR}(95\%CI) = 2.62(0.55-12.50, p = 0.23)\], exercise \([68\% \text{ vs. } 72\%]; \text{OR}(95\%CI) = 0.86(0.29-2.59, p = 0.79)\], daily activities \([97\% \text{ vs. } 82\%]; \text{OR}(95\%CI) = 12.96(0.97-173.75, p = 0.05)\] and bed rest \([97\% \text{ vs. } 95\%]; \text{OR}(95\%CI) = 1.50(0.11-20.75, p = 0.76)\]. There were very few inappropriate recommendations for daily activities and bed rest which resulted in wide 95% confidence intervals, making it difficult to be conclusive about these areas of recommendation. **Discussion:** This study found little evidence of negative attitudes towards physical activity promotion for older adults amongst student Physiotherapists and Occupational therapists in the UK, contrary to that reported within the literature for qualified HCPs. This suggests ageists attitudes towards physical activity in older adults with chronic pain are not developed during HCP training. Post registration education may be where anti-ageist attitudes need be addressed. **Keywords:** Pain; Physical Activity; Professionals; Treatment.

**The impact of chronic musculoskeletal pain on physical activity in older adults: Implications for self-management**

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**Introduction:** Many adults live with chronic pain to the detriment of their health and well-being. Although chronic pain is not a direct function of age, it is a particular problem for many older people. Physical activity can be particularly affected, which can in turn lead to subsequent problems with fitness, function, and the person’s ability to manage their condition. Increasing physical activity is recommended as a strategy to improve self-management of
chronic pain and, not surprisingly, such efforts meet imposing barriers. These issues are being investigated under the EOPIC study and related work. EOPIC stands for Engaging with Older People and their carers to develop Interventions for the self-management of chronic pain. This is a collaborative study funded by the Medical Research Council Lifelong Health and Wellbeing programme. **Aims:** To explore the relationship between physical activity, pain and self-management of Chronic Musculoskeletal Pain (CMP) from the perspective of older people >65 years with CMP; to investigate the evidence underlying recommendations to improve physical activity for older people with CMP. **Methods:** Data were obtained from interviews and focus groups with older people with CMP; from systematic reviews of the literature; and from experimental studies. **Results:** Overarching themes were the reduction of physical activity because of pain, efforts to improve physical activity and pain, the importance of physical activity as part of self-management. Evidence supporting interventions to increase physical activity in older people over 65 years with CMP is often based on findings from younger age groups because of the lack of age-specific studies in this field. **Discussion:** Physical activity has a key role to play in the self-management of CMP for older adults. Insight into the perspective of the older adult with CMP aids the understanding of how interventions may be developed and applied. **Keywords:** Musculoskeletal; Pain; Physical Activity; Self-Management.

**Exploring everyday activity and function in older adults with chronic pain: New insights with new technology**

Wilson G¹, Martin DJ¹, Jones D², Schofield P³

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**Introduction:** Chronic pain can affect older individuals in numerous ways, including negatively affecting physical activity and function. **Aims:** There were two aims to this study: to explore the day-to-day patterns of activity, function, and experiences of older adults with chronic pain, and to explore the usability, acceptance, and experience of the measurement tools used in the study. **Methods:** All participants were over 65 years old, and all were living in the community with persistent pain (pain for more than 3 months). Individuals took part in the study for a period of 7 days in which they wore 2 pieces of technology; a LifeShirt and a Sensecam. The LifeShirt is a vest with inbuilt sensors, worn under normal clothing, which allows continuous recording of physical and physiological activity. The Sensecam is a small wide-angle camera worn on the body that automatically takes pictures of the person’s environment every 30 seconds, thus acting as a visual diary. The participants also completed a daily diary (based on the Day Reconstruction Method). Participants took part in interviews after the study period in order to gather contextual information regarding pain, activity, and daily function, and to acquire information about their experiences and acceptance of using the methods throughout the study. **Results:** Results to date show a range of patterns of activity and function, and demonstrate a good degree of acceptance of the methods. **Discussion:** The innovative method allows a deeper understanding of activity and daily function of older adults living with chronic pain. As data collection progresses, the emerging themes will be explored in more depth. **Keywords:** Pain; Daily Function; Physical Activity; Measurement of Activity.
EUNAAPA SYMPOSIUM: WORKSHOP ON ACTION, AGING, PHYSICAL ACTIVITY AND PARTICIPATION

Hopman-Rock, Marijke1,2; Tak, Erwin1; Rydwik, Elisabeth3,4; Frandin, Kirsten1; Freiberger, Ellen5; van Meeteren, Nico1

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It is without question that regular participation in physical activities confers a variety of health benefits. However, despite this common knowledge about the potential benefits of physical activity, in industrialized countries the proportion of older persons being inactive is still extremely high. In March 2005, the European Network for Action on Aging and Physical Activity (EUNAAPA) was founded as a thematic, collaborative network aiming to improve the health, wellbeing and participation of older people throughout Europe by the promotion of evidence based physical activity interventions from micro up to macro levels. In EUNAAPA the following objectives have been proposed: To identify, disseminate and promote evidence-based practice for the enhancement of physical activity for all older people in Europe; To select or develop evidence-based guidelines for practice in the area of ageing and physical activity; To provide information, and expert advice to policy makers, providers, small and large business companies and professionals in the fields of ageing, physical activity, and health; To influence the development of educational curricula and standards of expertise and competence for professionals involved in the provision and/or enhancement of physical activity for older people; To develop synergies among researchers, providers, small and large business companies and professionals in the fields of ageing, physical activity, health and participation; To support policymakers in intersectional approaches to the promotion of physical activity among all older people; To cooperate with other organisations relevant to the promotion of physical activity among all older people; To involve older people in the development and implementation of network activities.

Development and goals of the EUNAAPA network

Hopman-Rock, Marijke

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Background: During the world conference on Physical Activity (PA) and Aging in London Ontario (2004), the idea was launched to form a European network to enhance implementation of existing knowledge in the area. Ellen Freiberger (Germany), Lis Puggaard (Denmark) and Marijke Hopman-Rock organised the first network meeting in Leiden in March 2005. Fourteen countries were present and after three days of intensive work together, we drafted a proposal for the DG Sanco section of the European Commission. This mission succeeded and the first European Network for Action on Ageing and Physical Activity (EUNAAPA; www.eunaapa.org) project was born. Objectives: In this presentation, an overview will be given of the scientific evidence for the relationship of PA (behaviour) with ageing which are supportive for the vision and goals of EUNAAPA, using several position statements of
leading organisations. **Methods.** A. Overwhelming evidence from RCTs and/or observational studies. B. Strong evidence from a combination of RCT and/or observational studies. C. Generally positive or suggestive evidence from a smaller number of observational studies and/or uncontrolled or nonrandomized trials. D. Panel consensus judgment. **Results:** In most areas, A/B level of evidence is found. The outcome of treatment of some diseases and geriatric syndromes is more effective with higher-intensity exercise. PA levels in persons older than 75 years are still far below what is recommended. **Conclusions:** More PA (counselling and interventions) could be effective if implementation barriers are overcome. This finding has been encompassed in the new roadmap for the future policy of the EUNAAPA. **References:** Chodzko-Zajko et al. American College of Sports Medicine position stand. Exercise and physical activity for older adults. MSSE. 2009; 41, 1510-1530; Biddle S J H, Brehm W, Hopman-Rock M, Verheijden M W. Population physical activity behaviour change: a statement of the European College of Sport Science. EJSS (2011).
Objective: These systematic reviews aimed to critically evaluate the reliability, validity and responsiveness of physical activity, clinical walking speed, Timed Up and Go (TUG) and overall indexes in older people. Methods: Literature searches were performed in several different databases. Key words were based on the topic of the measurement properties for each area respectively. The methods and results of all the evaluated measurement properties were rated using a standard checklist for appraising the qualitative attributes and measurement properties of the instruments. Results: Eighteen articles on 13 different physical activity measurements, 86 articles on walking speed, 68 articles on TUG, and 78 articles describing 12 different overall indexes were reviewed. For Physical activity the International Physical Activity Questionnaire – Chinese and the Women’s Health Initiative-PAQ showed good reliability while the Physical Activity Scale for the Elderly showed variable results for validity. Habitual walking speed seems to be highly reliable in community-dwelling people and residents in mixed settings, while no studies have evaluated maximum walking speed in an aged population. Walking speed is a highly valid test, both at habitual and maximum speed but few studies gave information about responsiveness. The reliability of TUG was high in most studies but there is a lack of studies evaluating absolute reliability. The validity was high in most respects except regarding prediction. Few studies gave any information about responsiveness with respect to TUG, yielding inconclusive results. Regarding overall indexes Short Physical Performance Battery (SPPB) can be recommended most highly in terms of validity, reliability and responsiveness, followed by the Physical Performance Test and Continuous-Scale Physical Functional Performance. Conclusion: Physical activity measurements need further evaluation, both habitual and maximum walking speeds are valid instruments and they predict death, hospitalization/institutionalization and decline in mobility. TUG can be recommended to be used in most settings and SPPB is the overall index of choice. References: Forsén L, Loland NW, Vuillemin A, Chinapaw MJ, van Poppel MN, Mokkink LB, van Mechelen W, Terwee CB. Self-administered physical activity questionnaires for the elderly: a systematic review of measurement properties. Sports Med. 2010; 40:601-23; Rydwik E, Bergland A, Forsén L, Frändin K. Psychometric properties of Timed Up and Go in elderly people: a systematic review. Phys Occup Ther Geriatr 2011; 29: 102-125; Rydwik E, Bergland A, Forsén L, Frändin K. Investigation into the reliability and validity of the measurement of elderly people’s clinical walking speed: A systematic review. Physiother Theory Pract 2011, Sept 19 [Epub ahead of print]; Freiberger E, de Vreede P, Schoene D, Rydwik E, Mueller V, Frändin K, Hopman-Rock M. Performance-based physical function in older community-dwelling persons: A review of instruments. Submitted to Age Ageing, October 2011.

The future of EUNAAPA: Action and invitation
van Meeteren, Nico¹; Tak, Erwin²


Objectives: To actively enlarge the societal and economic impact of the bundled talents, innovative knowledge and experiences of EUNAAPA via its members into the whole of Europe for the sake of life long active participation of all older European citizens. Methods and results: Circulation of the over the past years jointly built innovative knowledge and experiences within the network, via projects, newsletters, summer-schools and multimedia; increase the effort and spread of new knowledge via multilevel (macro-meso-micro level)
interdisciplinary integrated projects (one of which will be a project for the validation and spread of the “Better in, better out” concept; see references), if possible and relevant also in private-public co-operations and together with co-networks (HEPA, PROFANE, EGREPA, EUMusc, etcetera’s); and last but not least active involvement in Brussels’ to influence and set up agendas for policies and interventions for active participation of the older adults in Europe and, rather revolutionary, in EUNAAPA itself! Conclusion: In order to continue the overwhelming success of innovation for society over the last two centuries, active participation of all people, especially older adults, is paramount. EUNAAPA’s knowledge, network and dissemination strength to actively involve older adults in society in this respect may play a pivotal role here. Thus, increase and strengthening of its innovative knowledge and experiences will be the main issue in the next years. We welcome all embers and all non-members to participate, and share our ambitions. References: www.eunaapa.org; Hulzebos et al., JAMA 2006; Dronkers et al., Clin Rehab 2010; Hoogeboom et al., Osteoarthritis Cart 2009, Clin Rehab, 2010 and PlosOne 2012.

“GET FIT FOR ACTIVE LIVING”: HELPING OLDER CANADIANS TO GET AND STAY ACTIVE

Stathokostas, Liza¹; Paterson, Don¹; Copeland, Jennifer²; Doerksen, Shawna³

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The Get Fit for Active Living (GFAL), an 8-week evidence-based program, is an older adult physical activity education/experiential program developed by the Canadian Centre for Activity and Aging. The GFAL research project was a demonstration project which sought to demonstrate how community based structured exercise educational programs can be delivered in Canada. Almost 200 adults 65 years and older from five cities in Canada participated in this project that educates older adults about the importance of exercise and provides them with experience in developing an exercise routine, which in turn motivates them to continue their exercise. The purpose of the project was to determine the long-term functional fitness changes and program adherence at 6- and 12-month follow-ups in previously sedentary older adults. An additional purpose was to assess the impact of “booster” sessions on long-term exercise adherence rates. The symposium will cover a study overview, short-term and one-year functional outcomes, changes in physical activity patterns and physical activity self-efficacy. Keywords: Active Living; Fitness; Exercise; Motivation and Behaviour Changes.

NUTRITIONAL INTERVENTIONS ON AGEING MUSCLE AND BONE HEALTH

Candow, Darren¹; Chilibeck, Philip²

¹University of Regina, Canada, ²University of Saskatchewan, Canada.

Exercise and nutritional strategies for the prevention of osteoporosis

Chilibeck, Philip

University of Saskatchewan, Canada.

Exercise and proper nutrition are important for preventing bone loss and preventing development of osteoporosis. Several nutritional supplements have been promoted for preventing bone loss including soy isoflavones and conjugated linoleic acid. Optimal exercise for building bone and preventing osteoporosis includes exercise that induces high impact loading (i.e. jumping, bounding) and high muscle tension (i.e. resistance training). The
exercise prescription for someone who has already developed osteoporosis and has fragile bones could be quite different. This presentation will discuss controversies surrounding nutritional supplementation including findings that soy isoflavone supplementation may actually interfere with the positive effects of exercise on bone. The optimal types of exercise for preventing osteoporosis and safe exercise prescriptions for people who have already developed osteoporosis will also be discussed.

**Effect of creatine application strategies on aging muscle and bone health**

Candow, Darren

*University of Regina, Canada.*

The age-related loss of muscle (sarcopenia) and bone mass (osteoporosis) has a negative effect on muscle strength, functionality and overall quality of life. Creatine supplementation has been shown to have a positive effect on aging muscle mass and strength when combined with resistance training. The timing of creatine supplementation during resistance training may be an important factor for stimulating muscle hypertrophy in older adults. In addition to the positive effects from creatine supplementation on aging muscle mass, creatine may also have a favorable effect on bone health. This presentation will discuss the effects of creatine supplementation and resistance training on properties of aging muscle and bone biology.

**SEDENTARY BEHAVIOUR: OPPORTUNITIES FOR ACTION SYMPOSIUM**

Chastin, SF; Gardiner, P; Matthews, C; Stamatakis, E; Grant M; Deforche, B; Owen N.

1Glasgow Caledonian University, UK; 2The University of Queensland, Australia; 3Mater Medical Research Institute, Australia; 4National Cancer Institute, United States; 5University College London, UK; 6Vrije Universiteit Brussel, Belgium; 7Ghent University, Belgium; 8Baker IDI Heart and Diabetes Institute, Australia.

Sedentary behaviour is defined as activities performed while sitting or lying with low energy expenditure. In modern society, the vast majority of time is spent seated whether for work, transport or leisure activities. There is mounting evidence that this time spent sedentary has specific physiological and deleterious effects on health and wellbeing distinct of those due to lack of physical activity. In order to promote health and wellbeing interventions need to consider not only increasing physical activity but also decreasing sedentary behaviour. The majority of sedentary behaviour research has been conducted in children and adult populations, yet older adults are the most sedentary segment of society. This symposium brings aims to redress this balance by presenting the evidence related to sedentary behaviour research in older people and to identify opportunities for action. **Keywords:** Sedentary Behaviour; Intervention; Behaviour Change.

**Sedentary behavior and health: A view from the National Institutes of Health–American Association of Retired Persons diet and health study**

Matthews, Charles E

*Division of Cancer Epidemiology and Genetics, Nutritional Epidemiology Branch, National Cancer Institute, United States.*

Older adults in Western countries routinely spend 60 to 70 hours or more each week in sedentary behaviors (i.e., sitting), and it appears that a few hours of exercise each week
may not be sufficient to provide complete protection against the adverse health effects associated with so much sitting. However, our understanding of the full range of health/disease outcomes associated with prolonged sitting remains incomplete. In the mid-1990’s The National Institutes of Health American Association of Retired Persons (NIH-AARP) Diet and Health Study enrolled more than 500,000 US adults aged 50 to 71 years into the study and it has followed their health since that time. It is among the largest prospective studies investigating the relation between time spent in sedentary behaviors and health in older adults. New results from the NIH-AARP Study will be presented evaluating the role of sedentary behaviors and all-cause, cardiovascular, and cancer mortality. In addition, study results for several incident cancers will be examined. The findings from our study and others continue to provide new insight into the range of disease outcomes that have been linked to large amounts of sedentary behavior in older adults, but many questions remain unresolved.

At what level (or amount) of sedentary behavior does the risk for chronic disease increase? How much, what type, and what patterns of physical activity are effective in minimizing risks associated with too much sitting? The opportunities for answering these etiologic questions and addressing future measurement challenges will be discussed.

**Association between sedentary behaviour and cardiometabolic risk factors in older adults**

Stamatakis, Emmanuel

*University College London, UK.*

**Study Objective:** To examine the associations between sedentary behaviour (SB) measured objectively and by self-report and cardiometabolic risk factors. **Method:** Cross-sectional analyses of adults >60yrs who participated in the 2008 Health Survey for England. Main exposures were self-reported leisure-time SB consisting of TV/DVD viewing, non-TV leisure-time sitting, and accelerometry-measured SB. Outcomes included body mass index (BMI), waist circumference, cholesterol ratio (total/HDL), Hb1Ac and prevalent diabetes. **Results:** 2765 participants (1256 men) had valid self-reported SB and outcomes/confounding variables data, of whom 649 (292 men) had accelerometer data. Total self-reported leisure-time SB showed multivariable-adjusted (including for moderate-to-vigorous physical activity) associations with BMI (beta for mean difference in BMI per 30 min/day extra SB: 0.088 kg/m2, 95% CI .047 to .130); waist circumference (.234, .129 to .339cm); cholesterol ratio (.018, .005 to .032) and diabetes (odds ratio per 30 min/day extra SB: 1.059, 1.030 to 1.089). Similar associations were observed for TV time while non-TV self-reported SB showed associations only with diabetes (1.057, 1.017 to 1.099). Accelerometry SB was associated with waist circumference only (.633, .173 to 1.093). **Conclusion:** In older adults, SB is associated with cardiometabolic risk factors, but the associations are more consistent when is measured by self-report that includes TV viewing.

**Predominance of sedentary behaviour in clinical and rehabilitation settings and detrimental outcomes for the patient**

Grant, Margaret

*Glasgow Caledonian University, UK.*

Hospital admission may rapidly increase dependence in older patients and to avoid this it is recommended that rehabilitation should be implemented early in the hospital stay. Strategies to promote physical activity are considered central to preventing dependence and the physical
performance of patients is often a key factor in determining if a person is returned home or transferred to long-term care. Despite this, high levels of sedentary behaviour are commonly observed amongst patient groups in hospitals. This presentation will discuss the findings from a research study in which postural physical activity and sedentary behaviour was measured objectively. Using a single body-worn monitor, the postural behaviour of 30 patients in two rehabilitation units for older adults was recorded continuously over the period of a week. Results showed the group to be sedentary (sitting and lying) for 95% of the day (24 hours). There was little variation in behaviour between weekdays and weekends and, during the day, most upright activity (standing and walking) was recorded around lunchtime. The time between 08.00-20.00 was explored further and during this 12-hour daytime period 92% of the time was spent in sedentary postures. Much of this time (61.5%) was accumulated in prolonged sedentary events lasting an hour or more.

Effects of a behavioural modification program on sedentary behaviour and physical activity in Type 2 diabetes patients

Deforche, Benedicte; De Greef, Karijn; Ruige, Johannes; Bouckaert, Jacques; Tudor-Locke, Catrine; Kaufman, Jean-Marc; De Bourdeaudhuij, Ilse

1Ghent University, Belgium; 2Pennington Biomedical Research Center, United States.

Objective: To investigate the effects of a pedometer-based behavioural modification program with telephone support on sedentary behaviour and physical activity in type 2 diabetes patients. Research Design and Methods: Ninety-two type 2 diabetes patients from the endocrinology department of the Ghent University Hospital (Belgium) (62 SD 9 years, 69% male) were assigned to either an intervention or a control group using random allocation. Participants of the intervention group received one individual face-to-face session, a pedometer and seven telephone follow-ups during 24 weeks. The intervention was lead by a psychologist and based on the principles of cognitive-behavioral therapy, the Diabetes Prevention Program, the First Step Program and Motivational Interviewing. The selection criteria were (1) BMI 25-35; (2) treated for type 2 diabetes; (3) no physical activity limitations. Sedentary behavior and physical activity were measured using pedometer (steps/day), accelerometer (min/day) and the interview-based international physical activity questionnaire (min/day) over the short- (24 weeks) and intermediate- (one-year) term. Results: Participants in the intervention group decreased their sedentary behavior by 23 min/day (p < 0.05) and increased their steps/day with 2744 and total physical activity with 23 min/day (p < 0.001) post-intervention. After one year, the intervention group still had a decrease of 12 min/day in sedentary behavior and an increase of 1872 steps/day, 11 min/day total physical activity (p < 0.001). In contrast, the control group increased in sedentary behavior and decreased in physical activity. Conclusion: This 24-weeks pedometer-based behavioural modification program with telephone support showed a positive impact on sedentary behaviour and physical activity for at least half a year after the intervention (or one year post-baseline). This program represents a feasible and effective model for delivery through diabetes education centres.

A review of interventions to reduce sedentary behaviour in older adults

Gardiner, Paul; Healy, Genevieve; Owen, Neville; Eakin, Elizabeth
Purpose: Compelling epidemiological evidence suggests sedentary behaviour as a potential target for health behaviour change in older adults. To date, there has been no review of interventions to influence sedentary behaviour in older adults. This review addressed two questions: 1) How many behaviour change interventions have reported sedentary behaviour outcomes? 2) What are the features of these interventions? Methods: A structured search of Medline, PsycINFO, EMBASE, CINAHL, and PEDro was conducted for articles published to end of 2011. Included studies reported change in sedentary behaviour following intervention in older adults. Information on study design, intervention features and behavioural outcomes was extracted, and summarized. Results: Of the six studies identified, two specifically targeted older adults, with the remainder having a study population with mean age >60 years. Only 1 intervention targeted sedentary behaviour exclusively, two targeted sedentary behaviour in conjunction with physical activity, and three reported sedentary behaviour outcomes following interventions to influence physical activity. Four interventions reported reductions in sedentary behaviour, including all three specifically targeting sedentary behaviour. These interventions all used device-based measures to assess outcomes. Conclusions: While the field of research on interventions to influence sedentary behaviour in older adults is in its infancy, results from these early studies indicate that reductions in sedentary behaviour are achievable. To advance the evidence, future intervention trials should use device-based measures, conduct controlled evaluations (with detailed reporting) of intervention strategies, and further examine the inclusion of physical activity messages in sedentary behaviour interventions.

What sedentary behaviour intervention strategy? Can we learn from large scale computer simulation before trying them in real life?

Chastin, Sebastien FM
Glasgow Caledonian University, UK.

Introduction: Older adults are the most sedentary segment of society. Epidemiological evidence suggests that too much sedentary time has deleterious effect on health and well-being. The next stage on the research agenda is intervention studies to understand causation, dose response and develop effective interventions to modify sedentary behaviour. Aims: The aim of this study was to investigate the use of large-scale computer simulations to assess the effectiveness of different classes of interventions aimed at modifying sedentary behaviour. Method: The temporal behaviour of older adults is modelled using cyclical graph theory developed from empirical time series from the NHANES health survey. Different classes of interventions and different levels of adherence are simulated by changing the probability transition between states in the graphs. Monte Carlo techniques are used to sample response. Results: From the initial N = 1800 real profile, the method can generate N > 1 million ecologically valid and realistic responses to simple model of intervention. This, enables to theoretically explore more intervention scenario that physically possible in the real world. Discussion: Computer simulations have the potential to eliminate the need to test empirically all possible avenues and can be used as a filter to only concentrate on most promising method and better targeted interventions. Baseline empirical data for more specific population could be enriched with more contextual data to get more precise results.
FOOTBALL CLUBS AS A VEHICLE FOR PROMOTING HEALTH IN OLDER PEOPLE

Parnell, Dan1; Richardson, Dave1; Kielty, Robert2

1The Research Institute for Sport and Exercise Sciences, Liverpool John Moores University, UK; 2School for Business and Society, Glasgow Caledonian University, UK.

Corporate Social Responsibility (CSR) & specifically stakeholder engagement is becoming increasingly integrated into football business strategy. Traditionally, Football in the Community (FitC) schemes (the community arms and often charities of professional football clubs) have been tasked to deliver on participation and school based coaching agendas. However, there has been a significant shift from work of this nature towards more complex and multifaceted issues (i.e., behaviour change and health). The purpose of this symposium is to highlight the work undertaken by FitC schemes in attending to the health and social inclusion agenda for older people and in turn the promotion of active ageing. The symposium will firstly focus on the perceptions of club officials directly involved in the management and delivery of the Fit Fans In Training (FFIT) at a Scottish Premier League Football Club in relation to its impact on CSR. The symposium will then continue on a stakeholder engagement theme exploring one English Premier League Club and their work promoting health and social inclusion for older men within in the Fit Fans project funded by Age UK. The research will then open out to a national perspective with the presented work drawing on data from the Extra Time project. A project delivered nationally by the UK largest sports charity the Football Foundation. This research utilises a multi-method research framework, including Social Return on Investment analysis to understand the impact of the project across 20 English Premier League and Football League Clubs in promoting active lifestyles and social inclusion opportunities. The presentations will provide intervention results and detail how they have utilised evidence-based practice and thorough research and evaluation techniques on large and small-scale community based projects to successful promote and evidence more active and healthy lifestyles. Keywords: Behaviour change; Football; Men; Engagement

Engaging older football fans and corporate social responsibility (CSR): An analysis of club perceptions

Kielty, Robert

School for Business and Society, Glasgow Caledonian University, UK.

Introduction: Community involvement and the activities of Professional Football Clubs have received widespread focus and investigation (Brown, Crabbe & Mellor, 2006) with Corporate Social Responsibility (CSR) becoming increasingly integrated into football business strategy (Breibath & Harris, 2008; Walters & Chadwick 2009). Engaging older male fans in fitness and health promotion through the Fit Fans In Training (FFIT) intervention has been used as an initiative in tackling traditionally poor engagement with health services amongst this population, (Galdas, Cheater and Marshall, 2005; De Visser, Smith and McDonnell 2009). This study examines the perceptions of club officials directly involved in the management and delivery of FFIT at a Scottish Premier League Football Club in relation to its impact on CSR. Methods: Semi structured interviews at the end of the annual programme took place between Club officials directly involved with this programme (Head of the Community Charity; Health and Exercise Scientist; Executive Director). Auto ethnographical techniques involving personal narratives and access to personal notes during the intervention were also used to record perceptions of the programme. Inductive processes followed which involved
the formation of transcribed content into meaning units that were subsequently structured into theoretical themes for analysis. **Results:** The results indicate a strong awareness of the club to re-examine their CSR in relation to engaging with their older fans as part of a strategic long-term process. Engagement with this population led to the acknowledgement that older fans perceptions of club responsibility and culture is extremely positive and resulted in greater desire to exhibit greater fitness behaviour. Subjects reported a desire to restructure aspects of their organisation in order to accommodate ageing fans within their community charity model. **Discussion:** In promoting their CSR, Football Clubs could be disengaging from their ageing fan base with evidence suggesting that community programmes predominantly focus on (at risk) younger fans. Research indicates that clubs could be missing excellent opportunities as older fans are extremely positive and privileged to be engaged due to longer association. This study is also significant as very little research currently exists within this environment. This research also suggests that clubs may have to be more proactive and original when promoting their CSR across the age continuum. **References:** Breibath, T. & Harris, P. (2008): The Role of Corporate Social Responsibility in the Football Business: Towards the Development of a Conceptual Model, European Sport Management, Quarterly, Vol.8, No.2: pp. 179-206; Brown, A., Crabbe, T., & Mellor, G. (2006): Football and its Communities. Final report for the Football Foundation. Retrieved on 8th February, from www.substance.coop/files/football; De Visser, R.O., Smith, J.A. & McDonnell, E.J. (2009). “That’s not masculine”: masculine capital and health-related behaviour. Journal Health Psychology, Vol.14: pp. 1047-58; Galdas, P., Cheater, M.F. & Marshall, P. (2005). Men and health help-seeking behaviour: literature review. Journal Advanced Nursing, Vol. 49: pp. 616-23; Walters, G., & Chadwick, S. (2009): Corporate citizenship in football: delivering strategic benefits through stakeholder engagement, Management Decision, Vol.47, No.1: pp. 51-66. **Keywords:** Football; Health Promotion; Fitness Behaviour.

**Fit fans: Understanding the effectiveness of an intervention to promote positive behaviour change in older men delivered within an English League football club**

Bingham, DD1, Parnell, D1, Jones, R3; Richardson, D1

1The Research Institute for Sport and Exercise Sciences, Liverpool John Moores University, UK; 2Age UK, Lancashire, UK.

**Introduction:** Men appear to engage in a range of ‘masculine’ behaviours that contribute to poor health including poor diet (Gough and Connor, 2006) and lifestyles (De Visser, Smith and McDonnell, 2009). Additionally men tend not to engage in or delay the use of health services (Galdas, Cheater and Marshall, 2005). To tackle this football has been seen a vehicle to engage people in healthy lifestyle through the provision of health services (White, et al., 2011). This study focuses on the evaluation of the Fit Fans (FF) intervention in promoting positive behaviour change in older men. FF is delivered within a English Premier League (EPL) Football Club (FC). **Methods:** 7 men aged 45 > years attended weekly behaviour change and exercise sessions (1 hour in duration) across at 8 month period (Oct 2010 – May 2011). Each participant took part in at least one 6-week cycle. Baseline physiological measurements included (Body Mass Index (BMI), Resting Blood Pressure (RBP) and Abdominal Girth (AG) (these were repeated every 6 weeks). Following the initial session, the practitioner designed a personalised behaviour change programme for individual participant. The 1st Author engage in ethnography and observational research techniques to collect further information within field notes, alongside a reflective diary. **Results:** The results show no significant changes within the physiological measures; however, results evidence positive BMI changes in 3 men and weight management across the cohort. The men did make a range
of more subtle bespoke goals that impacted their day-to-day existence significantly (i.e., ability to walk short distances, reduction in alcohol intake), which made them ‘feel better’. Unexpectedly the cohort exhibited a range of serious diagnosed illnesses that challenged the practitioner’s skill base and experience in delivery on the health agenda. All participants reported the FC playing a role in making the prospect of engaging in behaviour change and exercise ‘more appealing’ than mainstream National Health Service support. **Discussion:** Practitioners have to be accustomed to subjective subtle goal setting that is appropriate to each individual and their daily life; and not engaging in the typical nature of just following national guidance. Whilst also be able to effectively deal with the complex needs of older men (i.e., a range of serious illness). The involvement of the FC appeared to contribute favourably to maintenance in the intervention. This research suggests for the provision of a community ‘facing’ facility within FC’s alongside appropriately skilled and experienced practitioners will strengthen health interventions, especially for older men. **References:**


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**An economic analysis of extra time: A football oriented community programme using social return on investment (SROI)**

Trotter, L1; Parnell, D2; Richardson, D2.

1The Football Foundation, London, UK; 2The Research Institute for Sport and Exercise Sciences, Liverpool John Moores University, UK.

**Introduction:** Extra Time (ET) is a national programme that aimed to promote positive physical and social opportunities in older people (over 55 years) and tackle social exclusion (Social Exclusion Unit, 2006). ET was delivered by Football in the Community (FitC) schemes across England. The aim of this research is to present the social and economic impacts of the ET programme. **Methods:** Social Return on Investment (SROI) is an adjusted cost-benefit analysis that quantifies the value of social, environmental and economic outcomes that result from a service/programme (NEF, 2004). Individual SROI analyses were carried out on five FitC schemes undergoing in-depth study. Stakeholder (i.e., participants and the state) engagement helped identify the outcomes. The 1st Author employed informal and interactional research techniques (including observations, informal interviews and personal reflections). The identified outcomes were measured via the development of entrance and exit participant surveys. 422 participants, 90% over 60 years old, (41% male and 59% female) completed both the entrance and exit surveys (after approximately 8 month’s engagement within the ET, Sept 2009–July 2010). Social and economic analysis was conducted employing SROI methodology, using the aforementioned data to provide evidence-based parameter values for use in the calculations. **Results:** Results indicate that the measurable social benefits outweigh the investment by more than 1:5.22. Most value is created for the participant. Authors are keen to tell the story of the complex measures and data involved and not merely focus on the SROI headline. In this sense, the data collected alludes to the development of positive physical, social and emotional changes in the participants, alongside a self-reported reduction in use of health services. **Discussion:** This work is vital in building upon the sparse literature available on SROI. The process was extensive, time consuming and expensive. Whilst this provided invaluable context and data, concerns are raised of the ‘pressure’ of a

Oral Presentations

**WORKING WITH FRAILER OLDER PEOPLE IN REHABILITATION**

**Exercise lapse problem-solving among cardiac rehabilitation initiates: Predicting solution persistence**

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Adherence to exercise is important for disease self-management in older adult (OA) cardiac rehabilitation (CR) initiates, but problems can lead to exercise lapses. Social cognitive theory (SCT) links self-efficacy (SE) to persistence required for adherence to activity. However, this efficacy-persistence process is seldom examined. Persistence related to lapse-related problems is key to exercise adherence self-regulation (Bandura, 1997). The model of social problem solving (MSPS) suggests that differences in problem-solving effectiveness (PSE) moderate behavior, where higher PSE individuals have better outcomes than lower PSE counterparts. The SE persistence relationship during lapse-related problems has not been examined relative to exercise in CR. Using the SCT and MSPS models, we examined SE and problem-solving (PS) as predictors of persistence toward PA adherence when OA CR initiates were facing a lapse-related problem (N = 33, age = 63.4 years). Participants were presented with a pre-tested, relevant problem about an exercise lapse. It was hypothesized that SE for exercise self-regulation would predict persistence with CR exercise self-regulation, and SE for PS would predict persistence with PS. Regression indicated significant relationships, $R^2_{adj} = .52, p < .001$ and $R^2_{adj} = .26, p = .001$, respectively. Hierarchical multiple regression was used to examine PSE and SE for lapse solution implementation (SESI) in predicting persistence with SI (PSI). PSE was related to PSI, $R^2_{adj} = .13, p < .05$. Together, PSE and SESI predicted PSI, $R^2_{adj} = .56, p = .001, R^2$ change = .42, $p < .001$. Finally, a moderator effect was detected by a significant interaction between PSE and SESI making additional contribution to total PSI, $R^2_{adj} = .61, p < .05, R^2$ change = .05, $p < .05$. This is a first demonstration of persistence-process relationships among OA CR exercise participants facing a lapse-related problem. Implications for research and OA exercise intervention will be discussed. **Keywords**: Cardiac Rehabilitation; Exercise Lapses; Self-Management; Problem-Solving.

**Physical activity levels of people attending Phase IV cardiac rehabilitation and those who no longer attend**

*Alexander, Lyndsay A; Hancock, Elizabeth*

*The Robert Gordon University, UK.*
Introduction: Cardiac rehabilitation (CR) is a well-established programme that enables patients to recover from an event and improve their functioning. The last phase in this process (Phase IV) is the long-term maintenance and management of cardiovascular health. We have investigated the physical activity levels in those attending Phase IV CR classes and those who no longer attend the classes. Methods: A questionnaire was sent to all current members of Phase IV CR and to those who no longer attend. The questionnaire also contained the Godin Leisure-time Exercise Questionnaire (GLTEQ) to assess self-reported 7-day physical activity. Results: There was a 60% & 34% response rate from Phase IV members & ex-members respectively. Demographically both groups were very similar in terms of age, weight and height. On average, Phase IV members attended a class once per week and only 26% stated they would like to attend more often. Over 80% of members travelled by car to the Phase IV classes and 51% of ex-members travelled by car to exercise as well. Both groups reported walking to be their most common physical activity. The ex-members commented on why they no longer attended the classes and the main themes identified were around a lack of challenge in the exercise/exercise elsewhere; work/other commitments; illness/other conditions and suitability/access issues. Physical activity levels in Phase IV members did not differ significantly from ex-members for mild exercise or total weekly activity. However, moderate physical activity levels between the groups approached a statistical significance and ex-members engaged in significantly more strenuous exercise than members (p < 0.019). Conclusions: Phase IV CR can provide at least 60 min a week towards physical activity targets for cardiovascular health. Strenuous physical activity levels may be higher in people no longer attending Phase IV CR, but further research is now being carried out to investigate this objectively. Keywords: Cardiac Rehabilitation; Physical Activity; Cardiovascular Health.

Physiotherapy intervention for preventing the deterioration of respiratory muscle function in the frail elderly

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Introduction: The loss of muscle mass and strength related to aging process can be cause of functional impairment and physical disability. In the oldest old, the respiratory function may be seriously compromised when the marked decrease of respiratory muscle (RM) strength coexist with comorbidity and immobility syndrome. Since RM training have been shown to be an effective method to improve RM strength and endurance, both in healthy people and patients, this could be an efficient method of preventing the lost of RM function among frail elderly. The purpose of this study was to determine the effectiveness of RM training using a threshold loading device, or Yoga Pranayama breathing exercises vs. a Control group in impaired elderly population. Methods: Eighty-one institutionalized elderly people (90% female, mean age 85) who were unable to walk or perform general exercise conditioning, were assigned randomly into three groups: a Control group and two experimental groups (Threshold and Pranayama). Experimental groups performed a supervised interval-based training protocol, either through respiratory threshold loading or Pranayama breathing exercises, 5 days per week during six weeks. The main outcomes were measured at four time points: baseline, in the middle of training, post-training and follow-up. Results: Seventy-one residents completed the study: Control (n = 24); Threshold (n = 23); Pranayama (n = 24). There was a significant treatment effect on the main outcomes: Maximum Inspiratory Pressure (F6,204 = 6.755, p < .001, U2 = 0.166), Maximum Expiratory Pressure (F6,204 = 4.257, p < .001, U2 = 0.111) and Maximum Voluntary Ventilation (F6,204 = 5.322, p < .001, U2 = 0.135). Conclusion: Pranayama training group works differently and better than the other
two groups, and may be therefore, a powerful alternative to general exercise conditioning in order to improve RM function in the elderly population, with a significant loss of mobility and exercise capacity. **Keywords:** Respiratory Muscle; Yoga; Exercise Capacity; Mobility.

**Tele-pulmonary rehabilitation in Scotland**

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**Background and Objectives:** Programmes of pulmonary rehabilitation (PR) are tailored to individuals to improve symptoms, quality of life and self-management. Many people, who live in rural areas, are socially isolated, or who live with severe disease that reduces mobility, are unable to travel far. Patients in Scotland were invited to participate in “hub and spoke” PR programmes, linking sites using video conferencing technologies. The key objectives for the project were: Improved health, well-being and empowerment; Increased physical fitness; Reduced exacerbations and anxiety; greater independence; Reduced social isolation; Fewer emergency admissions. **Methodology:** Two clinical measures were used: walking tests (Six Min or Incremental Shuttle) and the Chronic Respiratory Questionnaire (CRQ); and a Client Satisfaction Questionnaire, together with specific questions relating to the video conferencing experience. The innovative use of pc based video conferencing systems for clinical use was explored. **Results:** 226 patients: 110 conventional classes; 110 telelinked classes; 6 tele-education; Mean age 67 years; Mean improvement in walking distance 37%; Mean improvement in Chronic Respiratory Questionnaire domain scores; 30% additional capacity at each tele PR class; Cost per patient decreased due to increased throughput. **Conclusion:** The delivery of pulmonary rehabilitation using teleslinks is at least as good as a traditional model and is acceptable to patients. More patients able to benefit from PR; services delivered closer to home; contributes to peer support and cost efficient. PC based video conferencing technologies works well and is more flexible and portable. The Teams are now working on domiciliary telepulmonary rehabilitation, allowing access for patients who are at a more severe stage of the disease. These patients have not had consistent, equitable access to rehabilitation. We will be able to report on findings at the conference. **Keywords:** Pulmonary Rehabilitation; Respiratory; Video Conferencing; Technology.

**The self-management journey in long term conditions**

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**Introduction:** The Scottish Government are encouraging people living with a Long Term Condition to self manage. But what is self-management and what does it mean for the thousands of people living with long-term conditions in Scotland today? Chest Heart & Stroke Scotland will map out the journey of a patient living with a long-term condition, showing how both health professionals and patients should be aware of the services provided by the voluntary sector, which greatly support self-management. **Methods:** Living with a long term condition is a journey, in which the patient is in the driving seat, and we will show how the voluntary sector can support people at all the different stages: Diagnosis and acceptance of the condition by the patient; Understanding the condition; Identifying goals; Living with the condition. At each stage, patients and health professionals need to play their own part to allow progression. We will demonstrate how to navigate through the journey highlighting how patients, health professionals and the third sector can work together. **Results:** Self-Management results in empowered individuals who understand their role, as well as that
of the NHS and voluntary sector, in living with their condition. They understand how to identify appropriate services and how to access them. Understanding and participating in self-management results in patients who understand their condition, have the confidence to ask questions, know what ‘well’ means for them and how to maintain it. Successful self-management results in better communication and understanding between the public and health professionals, takes patients’ opinions into account in medical decisions and ultimately reduces hospital admissions. **Conclusion:** Self-management fits into the government’s vision for a healthier Scotland and with an ageing population it is vital that we work together to reach the ultimate destination of managing long term conditions. **Keywords:** Self-Management; Health Professionals; Communication; Long-Term Conditions.

**What do we know about frailty and physical activity? A critical review**

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**Introduction:** Frailty is a frequent health condition in older people. It increases the risk of several health problems, such as falls, comorbidity, disability, and death. Whilst experts support that there is an association between frailty and physical activity (PA), the exact role PA plays on frailty is unknown. The purpose of this study was to critically review current knowledge about the relationship between frailty and PA.

**Methods:** We carried out electronic searches in three databases (PubMed, Cochrane Library and PEDro) by interchanging terms related to frailty, PA, and older adults in AND combinations. We retained reviews, perspective/commentary and original studies.

**Results:** From a theoretical point of view, PA is probably an efficacious way for reducing frailty severity because PA positively impacts its possible physiological markers (e.g., interleukin-6); moreover, PA has a positive effect on the main domains used to operationalise frailty (e.g., strength, cognitive function). With regards to original researches, we found some evidence that PA improves health outcomes in frail older adults, such as mobility ability. Limited evidence suggests that frailty is not an obstacle as important as disability for taking up exercise training. However, we observed several methodological limitations related to the frailty field (e.g., is frailty a geriatric syndrome or just an expression of biological aging?) as well as to original studies (e.g., operationalising frailty by using a measure of disability). **Conclusions:** Based on current knowledge on frailty, there is limited evidence supporting a beneficial role of PA for frail older adults, which means that any solid conclusions cannot be drawn. However, this is related to studies’ limitations rather than a proven inefficacy or harmfulness of PA. We discuss how to overcome the methodological limitations found in research on frailty and physical activity and suggest new perspectives for future research on this topic. **Keywords:** Frailty; Physical Activity; Limitations; Mobility.

**Exploring the views of older adults at risk of cardiovascular events on active ageing: Implications for service development**

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Hamara is a Healthy Living Centre in Leeds providing community-based health related interventions, including an ‘active lifestyle’ programme for individuals at high-risk of a cardio-vascular event. A focus group with participants generated several themes regarding experiences and factors affecting motivation to attend (n = 8, 50% female, mean age 67; range 64-74). These included feeling supported by staff, not discriminated against because
of their age, and a range of associated psychological, physical and social benefits. These themes are congruent with those in the published literature (Fox et al., 2007, Bauman, 2004), which also describes relationships between sedentary behaviour and chronic diseases, alongside the impact of increasing physical activity on reducing risks of cardio-vascular events (Wannamethee and Shaper, 2001, Bauman, 2004, Myers, 2003, WHO, 2010, DiPietro, 2001). However, there are recognised gaps with specific relation older adults at high-risk of cardio-vascular events, those who choose to not participate in similar programmes, and factors affecting longer-term intentions and adherence to physical activity. We are addressing these gaps by building upon themes identified within the focus group, firstly by interviewing older adults who choose not to participate to understand their reasons for non-participation. We are also interviewing older adults who are currently or were historically engaged with the programme, to determine: whether they believe their age-specific needs were addressed; their views as to ways in which non-participants could be encouraged to participate, and; how they feel the programme has impacted upon their: motivation to initiate and adhere to a physically active lifestyle, and self-management of conditions placing them at high-risk of cardio-vascular events. When data collection and analysis is complete, we will consider the implications for service development. Keywords: Cardiovascular; Active Ageing; Self-Management; Implications.

Case studies from older adults with chronic health conditions participating in the Heartmoves physical activity program

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Background: The Heart Foundation Heartmoves program has been specifically designed for the older adult and especially those with a stable long-term health condition. Over the past 15 years, exercise professionals have been trained by health and fitness professionals to deliver the low to moderate intensity Heartmoves exercise program to the above-mentioned clientele. Aim/Objective(s): To share the stories of older adult participating in Heartmoves classes with different long term health conditions such as obesity, diabetes, heart disease, multiple sclerosis and peripheral neuropathy. The case studies will highlight the concerns of older adults entering physical activity programs and the importance of specific training for exercise professionals to be able to safely train the older adult and those with long-term health conditions. The case studies explore the perceived benefits to the older adult of participating in Heartmoves classes on a regular basis. The case studies will highlight the importance of delivering a balanced class including the following components:- muscular strength & endurance, cardiovascular conditioning, balance, flexibility, coordination, as well as an adequate warm up and cool down as well as the importance of social interaction with the leader and other participants. Keywords: Chronic Health; Cardiovascular; Physical Activity; Social Interaction.

IMPACT OF THE BUILT AND NATURAL ENVIRONMENT

Invited lecture: Engaging environments for active ageing

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The UK government has published a number of strategies for an ageing population including Building a Society for all Ages (CLG 2009) which highlights the importance of enabling older people to remain active and mobile within their local communities. This builds on the
strategy for housing in an ageing society, Lifetime Homes, Lifetime Neighbourhoods (CLG 2008) in which the design of both housing and the neighbourhood are equally important. While this movement has had a wider, positive impact on the experience of older people, a more rigorous evidence base is needed to support design for ‘lifetime living’; helping people, through design, to stay active and independent in their local communities over the life course. This is recognised by the World Health Organization’s Global Age-Friendly Cities programme (WHO, 2007), amongst others. This presentation reports on a major UK government-funded research project to fill this evidence gap, Inclusive Design for Getting Outdoors (I’DGO), a consortium of academics (Universities of Edinburgh, Salford and Warwick) and practitioners who provide design guidance on external environments for older people. Two key aspects of I’DGO will be discussed, namely how to better design streets and neighbourhoods to support older people being more physically active, and advances in methodology and theory to underpin design interventions.


Keywords: Active ageing; Design Interventions; Inclusive Design; Lifetime Neighbourhoods; Street Design.

Neighbourhood disadvantage and recreational cycling in a ‘baby boomer’ cohort: A cross-sectional multilevel analysis

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Background: Cycling confers many benefits for healthy ageing such as improved muscle strength, aerobic capacity, and balance. However, few studies have examined the recreational cycling behaviours of mid-aged adults, and whether the neighbourhood socioeconomic environment influences this activity. We examine the association between neighbourhood disadvantage and recreational cycling and whether this relationship was influenced by residents’ perceptions of crime and safety.

Methods: We used data from the HABITAT multilevel study of physical activity, which sampled persons aged 40-65 years (n = 11,037) living in 200 neighbourhoods in Brisbane, Australia. Neighbourhood disadvantage was measured using a composite socioeconomic index. Respondents were asked to report on the frequency of cycling during the last 12 months (never to regularly). Perceptions of crime and safety were measured using a six-item scale derived by Principal Components Analysis (alpha 0.80). The association between neighbourhood disadvantage and cycling was examined using multilevel logistic regression.

Results: Most respondents (66.4%) reported never cycling, and 11.7% cycled regularly: this latter group were more likely to be male, young, university educated, and living in a high income household. In a baseline model (age and sex adjustment only) residents of the least disadvantaged neighbourhoods were most likely to cycle. After adjustment for within-neighbourhood variation in education and income, neighbourhood inequalities in cycling were reduced, although residents of advantaged neighbourhoods were still more likely to cycle. Residents of disadvantaged neighbourhoods were more likely to perceive their suburb as being unsafe, and adjustment for this factor attenuated neighbourhood inequalities in cycling to non-significance.

Conclusion: In Brisbane, neighbourhood inequalities in recreational cycling are due mainly to individual-level compositional differences and not to built environment factors.

Keywords: Cycling; Neighbourhood; Natural and Built Environment; Socio-Economic.
Improving the walkability of the built environment for older people through community street audits

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This presentation will present and review the practical and successful walkable communities project Living Streets Scotland is delivering in 2011/12. The project has worked with three older people’s community groups in Aberdeen, Glasgow and Fraserburgh, facilitating community street audits to enable the community to identify and prioritise improvements to their walking environment and constructively engage with their local authorities to have short term (low cost) and longer term priorities implemented. The three groups are two health walk groups and a sheltered housing residents’ association. The Living Streets’ accredited Community Street Audit approach produces a focused eight-page report, identifying the local residents’ key concerns for consideration by the local authority. It also summarises the community group and neighbourhood demographics and socio-economic context, for example level of mobility, fears of crime and the key local services generating walking journeys. The presentation will discuss all aspects of the project from the literature review, the recruitment of groups to impact on the ground and monitoring / evaluation. It will identify common conclusions across the three groups around factors influencing physical activity levels and how to successfully implement an asset based approach. The emerging conclusions from the project highlight the need to maintain vegetation and footway surfaces and provide safe crossing points, reflecting key concerns common amongst older pedestrians around visibility and falls and highlighting shortcomings in current orthodoxy around traffic management and maintenance standards and priorities. The presentation will identify some of the key priorities for adapting the built environment for an ageing, less mobile population to maintain and maximise walking, the most common form of physical activity. Keywords: Natural and Built Environment; Walking; Physical Activity; Walking.

The influence of environmental factors on older adults’ walking for transportation: A study using walk-along interviews

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Background: Knowledge on the relationship between the physical environment and older adults’ walking for transportation is limited. Qualitative research can provide valuable information and inform further research. However, qualitative studies are scarce and fail to include neighborhood outings necessary to study participants’ perceptions while interacting with and interpreting the local social and physical environment. The current study sought to uncover the perceived environmental influences on Flemish older adults’ walking for transportation. To get detailed and context-sensitive environmental information, it used walk-along interviews. Methods: Purposeful convenience sampling was used to recruit 60 older adults (50% females). Walk-along interviews to and from a destination (e.g. a shop) located within a 15 min walk from the participants’ home were conducted. Content analysis was performed using NVivo 9 software. An inductive approach was used to derive categories and subcategories. Results: Data were categorized in the following categories and subcategories: access to facilities (shops & services, public transit, connectivity), walking facilities (sidewalk quality, crossings, legibility, benches), traffic safety (busy traffic, behavior
of other road users), familiarity, safety from crime (physical factors, other persons), social contacts, aesthetics (buildings, natural elements, noise & smell, openness, decay) and weather. **Conclusions:** The findings indicate that to promote walking for transportation a neighborhood should provide good access to shops and services, well-maintained walking facilities, aesthetically appealing places, streets with little traffic and places for social interaction. In addition, the neighborhood environment should evoke feelings of familiarity and safety from crime. Quantitative studies should investigate if (changes in) these environmental factors relate to (changes in) older adults’ walking for transportation. **Keywords:** Walking; Transportation; Natural and Built Environment.

**Transforming spaces, transforming lives: Engaging older adults in designing environments that enhance health and mobility**

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**Introduction:** The burgeoning older adult population is at risk for developing a myriad of health problems and is increasingly susceptible to the consequences of reduced mobility. The shifting demographic will challenge our cities to adapt the built environment to accommodate the compromised mobility/disability that can accompany ageing. Our research centers on a unique opportunity to capitalize on a “natural experiment.” Our key partner, the City of Vancouver (COV), is making a substantial investment in the built environment to create a Greenway through downtown Vancouver, Canada that prioritizes the of mobility pedestrians.

**Purpose:** As a first stage in this program of research, we participated in and evaluated the process of developing community-informed design plans that aim to increase the mobility and livability of the built environment, with a focus on older adults. **Methods:** In a series of focus groups, individual conversations, and guided walking tours we spoke with over 50 older adults who live along (or use) the proposed route. **Results and Discussion:** Based on a content analysis of our notes, we determined 4 key themes that reflect perceptions of older adults’ regarding key design features necessary to enhance mobility along the Greenway. 1. The current route is not a choice destination but could be. 2. Benches are essential. 3. Sidewalks must be smooth 4. Different opinions about whether automobiles should be allowed along the route. We discuss the themes presented by older adults and the challenges the COV must confront as they develop and modify their design plans to meet the needs of this age demographic. **Conclusion:** In order to best adapt the built environment to be age-friendly it is essential to involve older adults in the design process, however, expectations must be managed. Long-term health and mobility focused planning may not be immediately desirable for older residents living along a route targeted for modification. **Keywords:** Mobility; Natural and Built Environment; Health.

**Relationships between the physical environment and older adults’ walking and cycling behaviours: The Belgian aging studies**

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**Background:** Socio-ecological models emphasize the relationship between the physical environment and physical activity. The present study aims to investigate the relationship
between urbanization and other environmental factors and older adults’ walking and cycling for transportation and recreation and possible moderating effects. **Methods:** Data from 48,879 Flemish older adults were analyzed. Walking, cycling and environmental perceptions were assessed using self-administered questionnaires. The Study Service of the Flemish Government provided objective data on municipal characteristics. Multilevel logistic regression analyses were applied. **Results:** Urban participants were more likely to walk for transportation daily compared to rural (OR = 1.43; 95% CI = 1.22, 1.67) and semi-urban participants (OR = 1.32; 95% CI = 1.13, 1.54). Urban participants were less likely to cycle for transportation daily compared to semi-urban participants (OR = 0.72; 95% CI = 0.56, 0.92). Perceived short distances to services (ORs ranging from 1.04 to 1.19) and satisfaction with public transport (ORs ranging from 1.07 to 1.13) were significantly positively related to all walking/cycling behaviors. Feelings of unsafeness were negatively related to walking for transportation (OR = 0.93, 95% CI = 0.91, 0.95) and recreational walking/cycling (OR = 0.95, 95% CI = 0.92, 0.97). In females, it was also negatively related to cycling for transportation (OR = 0.94, 95% CI = 0.90, 0.98). **Conclusions:** Urban residents were more likely to walk for transportation compared to semi-urban and rural residents. Cycling for transportation less prevalent among urban compared to semi-urban residents. Access to destinations appeared to be important for promoting both walking and cycling for transportation and recreation. Additionally, feelings of unsafeness were associated with lower rates of walking for transportation and walking/cycling for recreation in all subgroups and cycling for transportation in females. **Keywords:** Walking; Cycling; Environment; Urban.

**EXERCISE AND PHYSICAL ACTIVITY FOR CARDIOVASCULAR AND RESPIRATORY HEALTH**

**Long-term physical activity patterns and lung function decline during adulthood: The Doetinchem cohort study**

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**Background:** Regular physical activity may improve lung health among adults. Since lifestyles are subject to change, the role of physical activity on lung function decline is ideally determined based on patterns of long-term physical activity levels. The objective of this study was to investigate the association between 10-year physical activity patterns and lung function decline. **Methods:** Men and women aged 26-70 years in the prospective Doetinchem Cohort Study were examined every five years. Data of three examination rounds (between 1995 and 2009) were used for current analyses. Being physically active was defined as spending 3.5 hours or more per week on physical activities of at least moderate intensity. Participants (N = 3452) were categorized as being persistently active, persistently inactive, becoming active, becoming inactive, and having a variable activity pattern. Associations between 10-year physical activity patterns and decline in forced expiratory volume in one second (FEV1) over 10 years were determined by linear regression analyses, adjusted for age, length squared, sex, education, smoking and change in BMI over 10 years, and baseline FEV1. **Results:** Preliminary analyses showed that FEV1 in adults who became physically active declined 29 (95% CI 1 - 57) ml less over 10 years than FEV1 of adults who became inactive. Sensitivity analyses restricting analysis to those participants with constant smoking
behaviour (persistent smokers and persistent non-smokers (N = 3002)) showed that 10-year FEV1 decline was less in adults who became active compared to those who became inactive (mean difference 34 (95% CI 7 - 61) ml, 43 (95% CI 13 - 72) ml, respectively). Being persistently physically active was not associated with a smaller decline in FEV1 over 10 years. **Conclusion:** Preliminary findings suggest that changes in long-term physical activity patterns affect lung function decline. **Keywords:** Long-Term Physical Activity; Lung Function; Smoking; Decline.

**Effect of concurrent training on resting metabolic rate in postmenopausal women**

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**Introduction:** Aging and menopause are associated with significant decrease in the resting metabolic rate (RMR), which can be explained by a reduction in the fat-free mass (FFM), and exercise is indicated to minimize these losses. **Objective:** To investigate the effect of concurrent training and fat-free mass on resting metabolic rate in postmenopausal women. **Methods:** A sample of 64 sedentary and postmenopausal women (61.6±7.0 years), distributed according to age (until 60 years and older) and type of intervention (only training, training plus diet, and control). Training group, composed of 34 subjects; training + diet group, composed by 17 subjects; and control group, composed of 13 subjects. The FFM was assessed by DEXA and RMR by indirect calorimetry. The RMR was measured for 30 min during rest. The caloric intake followed the recommendations of the AHA (2000). The intervention period lasted eight weeks, and consisted of 50-min strength training followed by 30-min aerobic exercise. The strength training followed ACSM (2002). The comparison between groups before and after intervention, were performed using the One-way analysis of covariance (ANCOVA), using the software SPSS, version 17.0. **Results:** After eight weeks of concurrent training, women aged older than 60 years, presented higher significant values in the RMR, adjusted by FFM, in the training (16.7±0.49) and training + diet (16.4±0.62) compared with control (14.5±0.54) group. **Conclusion:** Eight weeks of concurrent training alone or associated to a diet program were effective to increase resting metabolic rate in post menopausal women older than 60 years. **Keywords:** Postmenopausal Women; Metabolic Rate; Diet; Calorimetry.

**What does a moderate perceived exertion level during aerobic endurance training physiologically mirror in healthy seniors?**

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Promoting an appropriate amount of aerobic exercise training is regarded as a major public health concern. Comparative approaches to disentangle associations between subjectively perceived exertion levels and ventilatory, heart rate as well as metabolic responses are lacking in seniors. Therefore, the present study investigated submaximal physiological responses during a perceived exertion-paced 2-km exercise test in seniors, related to their maximal exercise capacity. 20 healthy and active seniors (10 males, 10 females, age: 65±3 years; weight: 69.7±10.9 kg; height: 1.70±0.10 m, physical activity: 11±6 hours per week) were examined by (a) walking-based treadmill ramp testing in order to assess maximal exercise capacity and (b) submaximal 2-km walking testing to compare submaximal Borg-paced exercise with individual maximal exercise capacity. The corresponding exercise
intensity of a moderate perceived exertion level (Borg-value of “four” at the CR-10 Borg scale) during VO₂max-testing was applied for the submaximal 2-km treadmill walking test. Moderate perceived exertion of “four” at the CR-10 Borg-scale lead to 76±8% of VO₂max and 78±10% of VO₂ reserve, 79±6% of HRmax, 64±5% of HR-reserve, and 133±18% of the first (VT1) and 92±9% of the second ventilatory threshold (VT2). The achieved exercise energy expenditure during the 2-km test (time: 27.5 ± 3.6 min) was 3.3±0.5 kcal/kg Bodyweight. No gender-differences of ventilatory, metabolic, heart rate and energy expenditure variables during maximal and submaximal exercise were found (p = 0.45). A moderate perceived exertion of “4” at the Borg-CR-10 scale would lead to an (a) adequate ventilatory, metabolic and cardiac response according to established health-related aerobic exercise recommendations and (b) additional absolute energy expenditure of approximately 1200 kcal for 30 min of exercising 5 times per week in seniors. Keywords: Aerobic; Health Promotion; Exercise Capacity.

The effects of a long-term physical activity and weight loss intervention on inflammatory biomarkers in older adults

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Purpose. To determine the independent effect of long-term physical activity (PA) and the combined effects of long-term PA and weight loss (WL) on circulating levels of inflammatory biomarkers in older adults, and to assess whether inflammation is a correlate of mobility.

Methods. 288 older (60-79 years), community-dwelling men and women at risk for cardiovascular disease (CVD) were enrolled in an 18-month randomized, controlled trial. Participants were randomized to either a PA (n = 97), PA+WL (n = 98), or successful aging (SA) health education (n = 93) intervention. Biomarkers of inflammation (adiponectin, leptin, IL-6, IL-6sR, IL-8, and sTNFR1) and 400-meter walk time (s) were measured at baseline, 6 and 18 months.

Results. Fasting blood samples at baseline and at least one follow-up visit were successfully collected from 270 participants. After adjustment for gender, wave, visit, and baseline outcome measure, only leptin and IL-6 showed a significant treatment effect. Follow-up log-adjusted leptin (pg/ml) was significantly lower in the PA+WL group compared to either PA or SA (9.99±0.04 vs 10.31±0.04 and 10.34±0.04, respectively; both p < 0.0001) and follow-up log-adjusted IL-6 (pg/mL) was also significantly lower in the PA+WL group compared to either PA or SA (0.75±0.04 vs 0.92±0.04 and 0.87±0.04, respectively; both p < 0.05). Spearman correlations between baseline 400-meter walk time and baseline inflammatory biomarkers revealed significant positive correlations for all biomarkers, except IL-8 (r range = 0.14-0.35; all p < 0.05). Only change in log IL-6 was significantly and directly related to adjusted follow-up 400-m walk time [8.05 (SE = 3.49), p = 0.02]. Conclusions. Addition of dietary-induced WL to PA reduced circulating leptin and IL-6 compared to PA alone and to health education in older adults at risk for CVD. Elevated inflammatory biomarkers were directly correlated to mobility at baseline, but only change in IL-6 directly predicted follow-up 400-m walk time. Keywords: Physical Activity; Diet; Weight-Loss; Cardiovascular Disease.

Physical activity patterns in older men and risk of fatal and non-fatal CHD: The mediating role of inflammatory and hemostatic markers

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Aims: To study prospective associations between physical activity (PA) in later life, changes in PA levels and risks of CHD incidence and mortality, and the mediating role of established and novel CHD markers. Methods: 4252 men from a UK population-based cohort self-reported usual PA (regular walking and cycling, recreational activity and sport) in 1996 and in 1998-2000, alongside other health behaviours and medical history. 130 fatal CHD and 207 first fatal or non-fatal events occurred during 9 years follow-up. Results: Among 3012 men free from CVD and diabetes in 1998-2000, 9% reported no usual leisure time PA and 33% “moderately vigorous or vigorous” PA. Compared to men reporting no activity, Hazard Ratios (HRs) (95% CIs) for first CHD event for “occasional”, “light”, “moderate” and “moderately vigorous or vigorous” PA, adjusted for age and region were 0.82(0.50,1.35), 0.67(0.39,1.17), 0.60(0.36,0.98), p(linear trend) = 0.04, adjustment for established risk factors (alcohol and tobacco use, social class, lipids, BP and BMI) attenuated HRs, abolishing the linear trend. Equivalent HRs for fatal CHD were 0.93(0.51, 1.68), 0.52 (0.27,1.02), 0.65(0.32,1.28) and 0.48(0.26,0.89), p(linear trend) = 0.004. HRs were partly attenuated by adjustment for established risk factors and completely attenuated by adjustment for CRP, D-dimer or vWF. CHD case fatality was markedly higher (72%) among inactive/occasionally active men than among men light or more active (52%) [age and region adjusted OR 2.45 (95%CI 1.25, 4.80)]. Men who maintained at least light PA or increased PA level appeared to have lower CHD risk than men who remained inactive or reduced PA level. Conclusions: Later life PA is important for primary prevention of CHD in healthy older men. Even modest PA levels nearly halved the risk of CHD morbidity and mortality, and halved case fatality. Associations were mediated by established CHD markers and, for mortality, by inflammatory and hemostatic markers. Keywords: Physical Activity; Later Life; CHD; Morbidity; Mobility.

Small arterial stiffness and aging in highly active people

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Introduction: Age-related stiffening of arteries is a strong marker for future cardiovascular complications with small arterial stiffness a better indicator of cardiovascular health than large artery stiffness. Information on the relationship between small arterial stiffness and physical activity is limited, however, as the large artery compliance has been the primary focus in most cardiovascular health studies. Purpose: The aim of this study is to assess the relationship between physical activity and small arterial stiffening in a younger and older adult population. Methods: Thirty-eight (Y) college students, (24 men, 14 women; 19.4 ± 1.2 y), and 49 older (O) adults (21 men, 28 women; 57.6 ± 10.5 y), were categorized as highly active (HA) (17 Y, 33 O) or normally active (NA) (21 Y, 16 O) based on self-reported vigorous physical activity questionnaires. Resting cardiovascular measurements included large (C1) and small (C2) arterial compliance, blood pressure, and heart rate. Statistical analysis included a general linear multivariate model with p < 0.05. Results: No differences were found between men and women and thus C1 and C2 values were subsequently pooled for sex. C1 and C2 were greater in the Y than the O (18.35 ± 3.8, 9.09 ± 2.4 vs. 15.8 ± 4.6, 5.8 ± 3.4 mL/mmHgx10, respectively). The HA (including Y and O) had greater C2 than the NA (7.57 ± 3.7 vs. 6.77 ± 3.04 mL/mmHgx10) but there were no differences in C1. Conclusion: The literature has shown highly active adults to have greater large arterial compliance than their normally active peers and conversely no difference in large arterial
compliance between young active and normally active people. We demonstrated that both the young and old highly active groups have greater small arterial compliance than their normally active age-matched peers that may indicate that high levels of habitual exercise reduce the risk for future cardiovascular complications. **Keywords:** Physical Activity; Arterial Stiffness; Aging; Cardiovascular.

**The lunar trek: Heart and chest patients make it to the moon**

*Galbraith, Duncan*¹; Cotter, Nicola²; Thow, Morag³

¹Inverclyde Globetrotters, UK; ²Chest Heart & Stroke Scotland, UK; ³Glasgow Caledonian University, UK.

**Introduction:** The Inverclyde Globetrotters affiliated to national charity Chest Heart & Stroke Scotland (CHSS) in 2010. CHSS has over 60 heart and chest community peer-support groups across Scotland. These affiliated groups, which are member/volunteer led, provide a wide range of activities and offer members, relatives and carers ongoing support, stimulation and companionship in a friendly and relaxed environment. **Methods:** The Inverclyde Globetrotters had formed in 2008 from a weekly Phase IV cardiac rehab class. Members were asked “Do you fancy walking round the world” to encourage them to stay active between classes and give them a long-term goal and provide a sense of achievement. The approach is simple and fun. All you need is a pedometer. Each week steps walked and the distances walked, cycled and rowed during the class are recorded. Members now look at the distance screen on the gym machines rather than the clock. They became a team. In May 2010, after 117 weeks on the road, the Inverclyde Globetrotters arrived back in Greenock having clocked up 30,688 miles. Class attendance has doubled to an average of 23. The distance walked has doubled to an average of 440 miles per week. The average age of members is 69 years. Inspired by the success of the Globetrotters, groups across Scotland from Orkney to Dumfries embarked on their own virtual tours, to collectively help the Globetrotters reach their next destination – the Moon. **Results:** Over twenty weeks they walked, ran, cycled and danced over 240,000 miles. Their feat has been supported by local communities and had the backing of one of Britain’s best-known figures, astronomer Sir Patrick Moore, the UK Prime Minister, the First Ministers of Scotland, Northern Ireland and Wales and members of the Scottish Parliament. **Conclusion:** The aspiration of the Globetrotters, that exercise can be fun, develops camaraderie and most of all can help people to stay well and out of hospital, has been realised. **Keywords:** Globetrotters; Pedometer; Heart and Chest Patients.

**USE OF VOLUNTEERS TO PROMOTE ACTIVITY**

*Invited lecture: Retiring into action*

Cullen, Brid

*University of Edinburgh, UK.*

The growing ageing population is a unique opportunity to engage older people in strengthening communities and building their capacity. How do we impart this message to policy and decision-makers at local and national levels? My Research Fellowship at the University of Edinburgh, on the theme of Active Citizenship in Later Life, includes organising a two-day conference in late June, entitled Retiring into Action. This will bring together policy-makers, researchers and practitioners from around the UK and Europe, to share evidence of positive approaches that promote older people’s participation in society.
Delegates will share the experience of their country in trying to engage older people as active citizens and volunteers. The countries represented include Denmark, Ireland, Czech Republic, and Germany, and this pan-European dimension will be an important feature of our discussions. The programme will identify ways to work collaboratively to influence the policy agenda, identify gaps and areas where capacity needs to be addressed, and develop an action plan to address these issues. The findings and conclusions will be presented for discussion and debate at this seminar.

“If they can do it . . . then so can I!” Using volunteer peer educators to assist in exercise program campaigns

Castell, Patricia S
Northern Sydney Health District, Australia.

Older adults often do not or may not perceive the immense health benefits gained by undertaking appropriate exercise programs to suit their conditions and abilities. Ways to encourage older adults to overcome the identified barriers to become and remain physically active is very challenging. Peer mentoring and modelling has been found to be of value in this area. By having older adults demonstrate appropriate exercises and provide information to their peers, it has been shown to be an effective means to facilitate exercise engagement for many older people who are less active, have health issues and physical functional problems. An older adult display team have been involved for many years in demonstrating exercise options available which have triggered many people become and remain physically active for as long as possible. “The Motivators” are a team of volunteers who demonstrate safe and appropriate exercises to community groups. The team age ranges from mid fifties to mid nineties. Their aim is to raise awareness, demonstrate, inspire, encourage and motivate older adults to exercise. These displays and activities have been undertaken in many settings, primarily in community and supported care. The demonstrations alleviate many older adult concerns which range from general fitness and health issues to specific conditions. Sessions often support a health education component relating to a specific topic. Team members have also been involved in the development of older adult resources such as “Staying Active – Staying Safe” falls prevention exercise booklet, video and DVD. The group is facilitated and accompanied by a specialist in exercise for older adults. Keywords: Volunteering; Peer Mentor; Health Promotion; Physical Activity; Exercise Programme.

Mobility limitation, access to outdoors and quality of life: A randomised controlled trial delivered by older volunteers

Rantanen, Taina1; Rantakokko, Merja1; Äyräväinen, Irma1; Khalil, Hannele2; Honkala, Sini2; Eronen, Johanna1; Lyyra, Tiina-Mari1; Vaarama, Marja3
1University of Jyväskyla, Finland; 2GeroCentre, Finland; 3National Institute for Health and Welfare, Finland.

The emphasis on home care instead of institutional care has increased the number of home-confined and isolated frail people in the communities. Volunteers could provide recreation for such people. We examined the effects of an individualized out-of-home recreational activity intervention on different dimensions of quality of life (QoL) among community living older people, who have difficulty accessing the outdoors independently. Volunteering, Access to Outdoor Activities and Wellbeing in Older people (VOW) project (ISRCTN56847832) was a randomized single blindered controlled trial (RCT) conducted in Jyväskylä, Finland,
in 2008-2011. The inclusion criteria were: agree to participate in a RCT, age 65 or higher, severe mobility limitation, willing to increase outdoor activity and able to communicate normally. 125 people aged 67-92 years meeting the criteria were interviewed at home and subsequently randomized into intervention or waiting list control group. Each intervention group member was assigned a trained volunteer who assisted the participant in attending recreational out-of-home activities once a week for three months. The primary outcome was QoL measured with WHOQOL-BREF which includes the overall QoL (2 items), physical capacity (7 items), psychological well-being (6 items), social relationships (3 items) and environment (8 items). The baseline characteristics of the intervention and control groups were comparable. For physical capacity subscale a significant treatment effect was observed (p = 0.005) while for other QoL dimensions no effects were observed. For the total score a borderline significant group difference was observed after the intervention (p = 0.076). This study suggests that decline of QoL among old severely mobility-limited people may be prevented with individualized out-of-home activity intervention. Keywords: Volunteering; Mobility; Quality of Life; Wellbeing.

**An overview of the development of physical activity programs for the elderly in Israel, 1996–2011**

Ben-Moshe, Yosefa

**ESHEL, Israel**

**Introduction:** In 2011, 42% of the elderly in Israel exercised on a regular basis, an increase of 6% during 17 years of organized programs aimed specifically for that population. The elderly in Israel are 10% of the population and the 65-75 year old are the biggest age group who exercise on a regular basis. The elderly in Israel are very diverse from ethnic, religious, education, income and cultural characteristics, and more than 25% are defined officially as “poor.” **Aim:** To provide a range of diverse services. **Methods:** A framework based on the Lawrence Green approach helped to develop a wide range of programs and services aimed at providing physical activities for different kinds of populations. The main principles guiding the development and assimilation of these services are: 1. Variety in content, with cooperation of local and national services for target groups. 2. Low cost of operation and physical accessibility. 3. Collaboration with a University Center. 4. Encouragement of programs based on elderly trained volunteers as main manpower. 5. The responsibility and operation of the programs is on the local authority and local associations for the elderly. **Results:** In 1996, most of the programs and activities were aimed at the disability free populations and today more efforts are dedicated to development of special programs for demented and homebound elderly. Recently we started an experimental visibility physical activity program for patients after rehabilitation from CVA, with intent to include physical activity programs for the “basket of medical services” paid by the government. Correspondingly, a wide range of challenging programs was offered to disability free elderly, like Nordic Walking workshops and Walk on The Israeli Trail. **Conclusions:** The programs will be presented in a systematic overview based on the Lawrence Green approach and historical development. **Keywords:** Ethnic Diversity; Physical Activity Programme.

**One to one volunteer conversation support: An innovative partnership**

Morrow, Linda1; Campbell, Valerie2; Rafferty, Lynsey2; McKerrow, Jayne3; Tibbs, Bronwyn3

1Chest Heart & Stroke Scotland, UK; 2NHS Greater Glasgow and Clyde, UK; 3Chest Heart & Stroke Scotland, UK.
The volunteer stroke service (VSS) provided by Chest Heart & Stroke Scotland (CHSS) was established 30 years ago to support individuals who have communication support needs following stroke. Each local service is coordinated by a staff member who manages a team of trained volunteers. Recent developments reflect the current approach to rehabilitation, helping individuals to identify personal goals and work towards independence. CHSS, in partnership with Glasgow Speech and Language Therapy Service (SLT) identified a local need for 1-2-1 conversation support. A range of services was developed including: hospital in reach which provides volunteers to support conversation in hospital, home outreach which focuses on social communication and community outreach which offers short term support, e.g. when first accessing public transport, or shopping. The services build on the work undertaken by the SLT by supporting individuals to participate in social communication thus raising self-esteem and building self-confidence to reintegrate into local community activities. The outreach coordinator is responsible for recruitment, retention and training of volunteers. Communication support training, including roles responsibilities and boundaries is provided by CHSS in house communication training team. CHSS community services provide a bridge between formal speech and language therapy and access to mainstream social activities. Leaving the service to progress to a more social group setting or an independent role in the community is viewed as a success. The provision of outreach communication support in partnership between Glasgow SLT and CHSS community services has been a positive innovation giving individuals a range of service options to support their journey from formal speech and language therapy to social activities within their community. Of those accessing the service, 87% successfully moved on to the next stage of their rehabilitation journey. Keywords: Volunteering; Stroke; Rehabilitation; Communication.

Meet-the-Expert Sessions

REACHING, STIMULATING AND SUPPORTING OLDER NOVICE SOCIAL ENTREPRENEURS TO DESIGN, DEVELOP & DELIVER INNOVATIVE NEW COMMUNITY VENTURES

Easson, Gillian

NESTA, UK

We recognise that it is important for the current generation to stay active in society, remain healthy and autonomous as long as possible. Through group workshops, support, peer mentoring and micro finance grants, Age Unlimited Scotland supported the young old - people in their 50s and 60s to play a central role in the development of social ventures. Workshops gave participants the chance to share and articulate their ideas to build confidence, test thinking and gain peer feedback, and then engage their communities in design and delivery of the creative solutions. The programme developed both the individual and their idea simultaneously; raising confidence and increasing aspiration levels to drive the person and their idea forward. We have learned a lot about what types of support are needed to reach, stimulate and support older people: 1) Reach - our programme reached everyday Mr. & Mrs. Ordinary in their 50s and 60s, who have never embarked on solving community/social challenges. 2) Stimulate - we created a motivational driver through the set social challenge: Yr 1 - reducing social isolation in the very old; Yr 2 - improving their community. Both had multiple beneficiaries: local organisations, family, friends and the community could impact from idea. 3) Support - five workshops, peer networking, mentoring, coaching,
micro finance and follow on business support has stimulated the enterprising behaviours and entrepreneurial skills of the individuals: the objectives were for the venture to have sustained community benefit and encourage active ageing of the participating individuals. Little has been done to innovate what people will do when they retire; we are keen to share the learning and approaches from this practical programme for the first time. **Keywords:** Social Environment; Innovation; Active Ageing; Retirement.

**MOTIVATE ME: ENCOURAGING UPTAKE AND ADHERENCE TO EXERCISE**

Tenn, Trish; Laventure, Bob

*Later Life Training Ltd, UK*

The Motivate Me (MMe) course, run by Later Life Training Ltd, is designed to provide both theoretical perspectives and practical applications on motivating older people to start and maintain regular physical activity. Motivate Me is an evidence based one day programme that examines in particular the underpinning knowledge of behaviour change. There are a number of models that are used to describe how humans behave and change their behaviour. They help in that they simplify ideas and give us a framework for thinking about ways in which we can operate. In particular, this session will help answer any questions you have about the conversation you want to have with an older person on their barriers, motivators and beliefs.

**Practical Workshops**

**SYMPOSIA AND PRACTICAL WORKSHOP: WORKING WITH HEART FAILURE PATIENTS**

**How to teach a home exercise programme for patients in heart failure**

Cowie, Aynsley¹; Thow, Morag²; Armstrong, Gillian¹; Graham, Keri³

¹NHS Ayrshire & Arran, UK; ²Glasgow Caledonian University, UK; ³NHS Greater Glasgow & Clyde, UK.

This symposium will be interactive and will address safe and effective exercise training to improve in function and physical activity in patients with heart failure.

**A comparison of home and hospital-based exercise training in heart failure: Immediate and long-term effects upon physical activity level**

Cowie, Aynsley¹; Thow, Morag²; Granat, Malcolm²; Mitchell, Sarah³

¹NHS Ayrshire & Arran, UK; ²Glasgow Caledonian University, UK; ³Scottish Government, UK.

**Background:** In heart failure, reduced physical activity level leads to deteriorations in physical and psychosocial functioning. No previous heart failure research has compared effects of home and hospital-based exercise training upon physical activity level, or has objectively assessed their long-term effects upon physical activity. **Methods:** Sixty patients with heart failure (mean age 66 years; NYHA class II / III; 51 male / 9 female) were randomised to home training, hospital training or control. Both programmes consisted of aerobic circuit training, undertaken twice a week for one hour, for eight weeks. All participants wore an activPAL activity monitor at baseline, and after eight weeks, for one week. The activPAL
identifies time spent sitting/lying, standing, and walking, and measures steps taken and walking cadence. Six months after cessation of training, a subgroup of participants from the home and hospital training groups (n = 10 from each group) wore the activPAL for a further week. **Results:** Hospital-based training significantly increased steps taken per day during ‘extra long’ walks of >500 steps (p = 0.04) and ‘long’ walks of 100-499 steps (p = 0.01). Neither programme had any immediate effect upon physical activity level otherwise. Though daily upright duration for the home group significantly improved six months after cessation of training (p = 0.02), generally physical activity level was maintained in the long term for both training groups. **Conclusions:** Hospital-based training enabled participants to walk for longer periods. It is clinically important that both training groups maintained physical activity level in the long term, given the potential for heart failure to worsen over this time period. **Keywords:** Heart Failure; Home-Training; Hospital-Training; activPAL; Walking.

**Development and formative evaluation of a computer-tailored physical activity education program for hospitalized heart failure patients**

Oosterom-Calo, Rony¹; te Velde, Saskia¹; Stut, Wim²; Brug, Johannes¹

¹Department of Epidemiology and Biostatistics, VU University Medical Center, Netherlands; ²Philips Research, Netherlands.

**Purpose:** Physical activity (PA) is important and beneficial for heart failure (HF) patients. The current work will describe the development of an intervention aimed at promoting PA among hospitalized HF patients including preliminary steps in the formative evaluation of the intervention. **Methods:** We applied the Intervention Mapping (IM) protocol. This entailed performing a needs assessment, defining change objectives, selecting determinants and strategies and developing the materials. We performed a systematic literature review, relied on Social Cognitive Theory and interviewed patients and professionals to select behavioral determinants and strategies. **Results:** The change objective defined was ‘patients consistently conduct mild PA on most days of the week for approximately half an hour’. Hospitalized patients cannot start performing PA, so the intermediate aim was intentions to perform PA after discharge since the Theory of Planned Behavior indicates that intention is the closest behavioral determinant. The selected determinants were practical knowledge on PA performance, self-efficacy for, and perceived benefits of, PA. The intervention included: 1) a video with actors (as role models) demonstrating the behavior, 2) a practical knowledge module, including assessments and tailored feedback, and 3) a self-efficacy module, including assessments of self-identified barriers to PA and tailored feedback to overcome the barriers. We pre-tested the assessments and feedback on patients and made adjustments accordingly. **Conclusions:** The systematic development of the computer-tailored PA program for hospitalized HF patients using the IM protocol resulted in a theory- and evidence-based intervention. The appreciation, usability and efficacy are yet to be determined in a trial. **Keywords:** Physical Activity; Heart Failure; Intervention; Technology.

**Exercise outcomes in chronic heart failure clients**

Barnard, Robert¹; Penhall, Robert²; Schild, Caelum¹; Littlechild, Dianne¹

¹Hampstead Rehabilitation Centre, Australia; ²Royal Adelaide Hospital, Australia.

**Introduction:** Chronic heart failure (CHF) is a condition that is associated with substantial morbidity and mortality. The aim of this program was to improve patient outcomes and reduce acute hospital admissions through sustaining regular participation in exercise.
Methods: Subjects were 139 patients, New York Heart Association Classification (NYHA) 1-3, who completed the CHF exercise program up to December 2010. The exercise program consisted of referral by the CHF Nurse Practitioner, initial assessment undertaken by the CHF Exercise Physiologist (EP) who undertook the exercise prescription and delivery of cardiovascular endurance and resistance exercises 1-2 times per week for 60 min. Mean number of sessions attended was 12.51. A review assessment was undertaken by the EP 3-6 months post discharge to evaluate adherence to exercise and functional levels. All data regarding hospitalisations was obtained from the online patient data system, a clinical service suite which provides users with access to patient information. Results: Of the 139 patients who completed the CHF exercise program, 56.8% (n = 79) of these had returned to hospital post discharge for cardio-respiratory (CR) reasons. Mean number of days from discharge to first CR hospitalisation for the cohort was 225.70 (SD = 191.21). The mean number of CR hospitalisations for those who continued exercising (121 patients) was 0.91, compared to 3.55 for those who didn’t continue exercising (p = 0.012). Those who continued exercising spent less overall time in hospital (mean = 5.15 days) than patients who didn’t continue to exercise (mean = 20.55), p = 0.0045. Conclusion: These results suggest that CHF patients who adhere to an exercise program, whether structured or unstructured, may have reduced cardio-respiratory hospitalisations and time spent in hospital due to cardio-respiratory reasons. Keywords: Heart Failure; Cardio-Respiratory; Hospitalisation; Exercise.

ENHANCING PHYSICAL ACTIVITY CLEARANCE: VALIDATION OF A UK VERSION OF THE NEW PAR-Q±

Buxton, Kim

BHF National Centre for Physical Activity and Health, Loughborough University, UK.

This workshop will explore current approaches to screening individuals prior to physical activity and reflect upon some of the benefits and challenges of existing approaches. The workshop will provide delegates with an opportunity to hear about the development of the new evidence-based Physical Activity Readiness Questionnaire (PAR-Q plus: Canada 2011) and learn more about the BHF National Centre’s international collaborative research to validate a UK version of PAR-Q plus. The workshop will be interactive and provide delegates with the opportunity to review the new PAR-Q plus and explore how it can be used in different contexts and settings. Keywords: PAR-Q; Screening; Readiness.

CLASSIFICATION OF SEDENTARY BEHAVIOUR: TOWARD A TAXONOMY

Chastin, Sebastien FM; Skelton, Dawn A

School of Health and Life Sciences, Glasgow Caledonian University, UK.

Sedentary behaviour is now established as a paradigm in its own right distinct from inactivity or lack of engagement in physical activity. There is a body of evidence to show that sedentary behaviours is associated with poor health outcomes and all cause mortality independently of levels of physical activity which is starting to influence policy worldwide. The next phase in sedentary behaviour research is to establish dose response and causality relationship between sedentary behaviours and health, improve understanding of context and determinants of these behaviours. Establishing a taxonomy of these behaviours should be an integral on the process of strengthening and refining the evidence base. We present and open science project dedicated to the development of such classification “Sedentary
behaviour International Taxonomy (SIT).” We discuss the method and the requirement of the taxonomy for modern multidisciplinary and lifespan research.

**WALK-SHOP: SUPPORTIVE PHYSICAL ENVIRONMENTS FOR OLDER PEOPLE**  
Newton, Rita; Ormerod, Marcus  
*SURFACE Inclusive Design Research Centre, the University of Salford, UK.*

*Warning – When I am old I shall wear purple walking boots (Jenny Joseph 1961)*

I shall sit down on the pavement when I’m tired  
...  
And run my stick along the public railings  
And make up for the sobriety of my youth.  
...  
But maybe I ought to practice a little now?  
So people who know me are not too shocked and surprised  
When suddenly I am old, and start to wear purple.

The aim of the Walk-shop is to provide opportunity for participants to reflect on what constitutes a supportive physical environment for older people. We know that the design and maintenance of the physical environment facilitates people’s ability to get out and about and in particular, the effective design of the neighbourhood street (Newton et al 2010) can support older people’s independence and increase social interaction and community engagement, reducing reliance on care in the home. The walk-shop will provide a gentle exploration either of the indoor or external environment, depending on weather. Walk-shop materials will be provided to prompt analysis of design features and to aid discussion. **References:** Joseph, J (1961), Warning. In Larkin, P. (Ed). (1973). Oxford Book of Twentieth Century English Verse. Oxford: OUP; Newton, R., Ormerod, M., Burton, E., Mitchell, L., Ward-Thompson C. (2010), Increasing Independence for Older People through Good Street Design. Journal of Integrated Care. 18, 3. Pp24-29.

**THE BEST PRACTICE OF THAI YOGA ON PHYSICAL ACTIVITY AND ACTIVE AGEING**  
Buranruk, Orawan  
*Faculty of Associated Medical Sciences, Khon Kaen University, Thailand*

Thai Yoga, known as Ruesidadton (Ascetics twisting) in Thailand (Siam), involves a series of active stretching exercises, with active Thai massage, integrated with meditation that affects flexibility and relaxation in promoting a sense of well-being. Workshop includes introducing Thai Yoga: history, definition, physiological effects, principles and techniques, and teaching practical skills. Discussion and demonstration of a typical routine follow by step-by-step instruction of Thai Yoga. Our aim is to determine that participants can do for their health. On the other hand, therapists can integrate into an existing practice for well-being and can get concept for their work in health education and health promotion. The results of the study showed that the teaching/learning of Thai Yoga enhanced elder cooperation. The reflective information provided on-going insights on the effectiveness of teaching/learning activities; thus allowing improvements to therapeutic approaches. **Keywords:** Yoga; Physical Activity; Active Ageing; Health Promotion.
EXERCISE FOR CARDIAC REHABILITATION (BAPCR)

Buckley, John¹; Traill, Mima²

¹Department of Clinical Sciences, University of Chester, UK; ²BAPCR Council, UK.

This workshop will cover the basic delivery of a Cardiac Rehabilitation session for patients in the community. The theoretical background, evidence base and a hands on ‘how to’ session will be interactive to allow the delegates to get a feel for a full-length session.

Posters

CARBOHYDRATE METABOLISM AND ASSOCIATED RISK FACTORS IN OLDER ADULTS

Martins, Raul A¹; Sousa, Nuno M F²; Fonseca, Andreia³

¹University of Coimbra, Portugal; ²University of São Paulo, Brazil; ³Portuguese Heart Foundation, Portugal.

Age is associated with several risk factors as increased body fat and abdominal fat, deterioration of the lipid profile, diabetes, raising in inflammatory activity, or decreased functional fitness. Epidemiological evidence suggests that A1C is associated with cardiovascular and ischemic heart disease risk. The aim of this study is to investigate the relationships between A1C and other risk factors like obesity, functional fitness, lipid profile, and inflammatory status in older adults. Data were available from 118 participants aged 65-95 years (72 women and 46 men). Anthropometric variables were taken, as was functional fitness, blood pressure and heart rate. Blood samples were collected after 12 hours fasting, and A1C, hs-CRP, glycemia and lipid profile were calculated. Bivariate and partial correlations were performed as was factorial analysis of variance. Women had higher A1C, glycaemia, TC, BMI, and lower and upper flexibility than men. Men had higher BW, WC, 6-min walking distance, and VO2peak than women. A1C associated positively with glycemia, HDL-C, TG/HDL-C, BW, WC, BMI, but not with functional fitness, TC, LDL-C, Log10 hs-CRP, PAD, or PAS. Obese participants had higher A1C than non-obese only with IDF but not with USDHHS criteria. Older women had higher A1C than men, even after controlling for BMI. A1C associates equally with BW, BMI or WC. Population-based criteria are recommended to classify obesity and to identify higher levels of A1C in obese older adults. A1C associates with atherogenic dyslipidemia particularly with TG and TG/HDL-C ratio, but not with TC, HDL-C, or LDL-C. A1C is not associated with hs-CRP, and with functional fitness and aerobic endurance. Keywords: Metabolism; Obesity; Functional Fitness; Cardiovascular.

FIFE SPORTS AND LEISURE TRUST CARDIAC REHABILITATION CONSULTATION

Prendergast, Fiona

Fife Sports and Leisure Trust, UK.

Background: In Fife, the Phase IV Cardiac Rehabilitation Programme is provided in partnership between Fife Sport and Leisure Trust (FSLT) and NHS Fife. This programme has been running for over 12 years. The programme is now reaching capacity, which could result in difficulties in meeting future demand for the programme. Aims: FSLT were considering amending the programme offered in order to manage future demand and ensure that both
new and existing clients had access to it. The options under consideration were to reduce the amount of time clients receive the discounted rate for to 12 weeks. On completion of the 12 weeks, they would be signposted to a health class appropriate to their needs. **Methods:** FSLT recognised that this would result in an increase in cost for clients and commissioned a consultation with clients to determine their reaction to the proposed changes. It was hoped that information from the consultation could be used to inform a future service strategy and explore the clients’ attitudes towards the proposed changes to the programme. The methodology for this research was developed in order to profile current clients of the programme in order to understand the type of clients who were accessing it and what they were using it for. The aim was to gather the views of a sample of current clients towards the proposed changes and recommend a positive way forward for FSLT, taking into account the needs of the service and the views of the clients. **Conclusion:** The consultation highlighted a number of benefits both for participants themselves, as well as their families, resulting from improvements in health and lifestyle. However, evaluations of programmes such as these often miss out on measuring the wider benefits these interventions can have on participants, their families and wider communities. FSLT have therefore decided to commission a social return of investment that will assess the social, economic and environmental value of the programme. **Keywords:** Cardiac Rehabilitation; Fife; Consultation.

**AN EXAMINATION OF THE EFFECTS OF PEER MENTORING IN A PHASE IV COMMUNITY-BASED CARDIAC REHABILITATION PROGRAMME**

*Martin, Antonia; Woods, Catherine B*

_Dublin City University, Ireland_

Long-term adherence to physical activity (PA) after a cardiac event is uncommon. Research has revealed peer social support, belief in the health benefits of exercise and task specific self-efficacy are necessary for this population to adhere long-term (>6 months) to structured PA (Martin & Woods, 2011). Peer mentoring suggests individuals with similar problems can offer one another a unique resource. This study examined the impact of Peer Mentors (PMs) on adherence of newcomers to an established phase IV Community-Based Cardiac Rehabilitation Programme (CBCRP). **Methods:** Long-term adherers (N = 8, 100% male, 64-77yrs, >12mths attendance) of a CBCRP were trained as PMs. Training (8 hours over 2 days) covered benefits, recommended levels, overcoming barriers, self-efficacy and goal setting for PA. The PM role was to provide support to mentees for a 6-week period. Newcomers to the CBCRP(N = 13, 82% male, 50-77yrs), were recruited and paired with a PM. Outcome measures included attendance rates, assessment of PA level (via accelerometry), psychosocial correlates (mentees only; via self-report self-efficacy, ERA-12, SF-12 questionnaire) and interviews (focus group with PMs, 1-1 interviews with mentees). **Results:** PMs: Key challenges were gauging support required by mentees, assisting exercise mastery, and conflicting input from CBCRP staff. Key recommendations were recruitment of more PMs, female PMs, flexible match period and formalised initial contact. PM PA levels were unchanged. Mentees: The 8 mentees (7 male) who were still attending CBCRP at 6-weeks (mean 67% adherence) significantly increased PA levels and reported positive experiences of the intervention. Dropout reasons were injury (N = 2), illness (1), pace too challenging (N = 1) and feeling too young for the class (N = 1). **Conclusion:** The intervention had a positive impact on PMs and Mentees, however, was insufficient to address adherence issue for all mentees; future research needs to examine this issue further. **Keywords:** Cardiac Rehabilitation; Self-efficacy; Peer Mentoring; Adherence.
EXERCISE AND NON-EXERCISE PREDICTION MODELS OF AEROBIC POWER BY SIX-MIN WALK TEST IN OLDER MEN

Mahecha Matsudo1, Sandra M1; Raso, Vagner2; Santana, Marcos3; Araujo, Timoteo4; Mello, Marco T5

1Physical Fitness Research Center - CELAFISCS and Physical Education College - FMU, Brazil; 2UNIBAN, Brazil; 3Federal University of Goias (UFG), Brazil; 4Physical Fitness Research Center - CELAFISCS and Physical Education College- FMU, Brazil; 5Center of Studies in Psychobiology and Exercise (CEPE-EPM-UNIFESP), Brazil.

Purpose: To develop both peak aerobic power (VO2peak) and distance prediction models using body mass (BM), body mass index (BMI), body fat (FAT), distance (D), body weight-walking distance product (DxW), and maximum heart rate (MHR) in healthy older men.

Methods: We measured body composition (BM, BMI, FAT) and peak aerobic power breath-by-breath during both cardiopulmonary exercise testing (CPET [velocity, heart rate and VO2 at anaerobic threshold and peak]) and six-min walk test (6MWT; [D, DxW, heart rate and VO2 at peak]) in 76 healthy older men aged 65 to 80 years (69.1 ± 0.3). Results: We observed significant correlations for VO2peak at 6MWT as a function of DxW (R = 0.75, P < 0.0005), BM (R = 0.56, P < 0.0005), D (R = 0.43, P = 0.0004) and maximum heart rate (MHR [R = 0.37, P = 0.001]); distance was significantly correlated with FAT (R = -0.43, P = 0.005), BMI (R = -0.36, P = 0.021) and age (R = -0.31, P < 0.045), whilst DxW with BM (R = 0.86, P < 0.0005). The inclusion of DxW raised the R2 from 0.65 to 0.74 and decreased the estimative error yielding the following equation (R = 0.86, SEE = 182.1 mL/min-1, P < 0.0005) for predicting VO2peak, i.e., VO2peak = 962.2 + (0.037 x DxW) + (8.565 x MHR). A non-exercise model was yielded by univariate regressions, but not for multiple regressions. Body fat percentage (R = 0.43, SEE = 702.2 m, P < 0.005) yielded the best model for predicting distance, i.e., distance = 702.2 - (3.067 x FAT). Conclusion: Our prediction model seems to be an accurate strategy to estimate VO2peak in healthy older men, mainly when DxW is considered. On the other hand, other studies should develop non-exercise models, especially based on DxW. Keywords: Exercise; Aerobic; Body Composition; Cardiopulmonary.

PREDICTION OF MAXIMAL HEART RATE IN MASTER CYCLIST AGED 40 TO 60 YEARS OLD

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Introduction: Maximal heart rate (MHR) is an important physiologic variable that is used as a guide to estimate effort and is also used as the basis for exercise prescription. An accurate predictor of MHR is necessary to prescribe safe and effective exercise in cyclist. To date, accuracy of MHR prediction in cyclist has not been well established. The purpose of this study was to develop a specific equation for predicting MHR in cyclist aged 40 to 60 years old, and compare with Tanaka and ACSM equations. Methods: One hundred thirty-one cyclist [Age: 46.41 ± 4.98 years; Body mass 73.11 ± 8.55 kg; Height : 169.54 ± 6.46 cm, BMI: 25.40 ± 2.28 kg/m2 an fat mass : 23.86 ± 4.33%; Training load : 8372 ± 3429.6 km per season], performed a graded maximal exercise test in a mechanical cycle ergometer (Monark 818E, Sweden) for cardiovascular assessment and aerobic exercise prescription. A total of participants met conditions for achieving maximal exercise testing criteria and were included in this study. M values were determined by electrocardiography and with a cardiomonitor Polar 610 (Finland). The mean data are presented ± SD. Maximal Heart Rate was considered...
as dependent variable and age as independent variables. To compare maximal heart rates and predicted eq. a Student’s paired t-test were used. Spearman correlation coefficients were performed to assess relationships between heart rate values. In all cases, a p < 0.05 was determined as significant. **Results:** An inverse relationship were found between MHR and age ($R^2 = 0.31, p < 0.0001$) a derived equation was $MHR = -1.5592 \times \text{Age (y)} + 246.8$ (Spearman correlation coefficient between predicted equation and MHR obtained in graded exercise test was significant ($\rho: 0.53, p < 0.001$) No significant differences were found between Alvero’s prediction eq and MHR (diff: $-1.96 \pm 11.62, 95\%\text{CI} : -3.97$ to $0.039$).

**Conclusion:** A predicted equation can be used to estimate maximal heart rate in master cyclists. **Keywords** Cardiovascular; Cycling; Heart Rate; Prediction.

**LONG-TERM EFFECTS OF A SUPERVISED EXERCISE PROGRAMME ON QUALITY OF LIFE IN PERIPHERAL ARTERIAL DISEASE**

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**Aim:** Peripheral arterial disease (PAD) is a chronic, progressive disease with a significant impact on quality of life (QoL). The main aim of treatment is maintenance or improvement in QoL by eliminating ischaemic symptoms and preventing progression to vascular occlusion. The use of patient-based measures of treatment effects including disease-specific QoL questionnaires has been recommended. The aim of this study was to determine the long-term (two -year) effects of a supervised exercise programme on QoL in patients with PAD. **Methods:** Patients with an ankle: brachial index (ABI) <0.09 were identified from the Non-Invasive Vascular Laboratory Logbook. Following informed consent and successful completion of a treadmill exercise test, patients were randomised to a control and an exercise group. The control group received usual care. The exercise group participated in a twice-weekly supervised exercise programme for 12 weeks. Data regarding quality of life (Interruption Claudication Questionnaire [ICQ]) was collected at baseline, 12 weeks, one year and two years. **Results:** Forty-four participants were randomly allocated to a control (n = 16) or an exercise (n = 28) group. Data was collected on 31, 30 and 23 participants at 12 weeks, one and two years respectively. There were no significant differences between the groups at baseline for ICQ scores. At 12 weeks there was a trend towards improved QoL in both groups greater in the exercise group ($p = 0.066$). At two years post-participation, ICQ scores in the exercise group were still lower than baseline (mean 34.66 v 31.67) reflecting improved QoL while ICQ scores in the control group indicated a continuing deterioration in QoL (mean 34.14 v 42.39). **Conclusions:** Results of this study provide evidence for the long-term effectiveness of supervised exercise. This study delivered an exercise intervention only. A more comprehensive multi-disciplinary cardiac rehabilitation programme may confer additional benefits. **Keywords:** Exercise; Peripheral Arterial Disease; Quality of Life.

**IMPACT OF PHYSICAL ACTIVITY BY WALKING ON CARDIOVASCULAR HEALTH AMONG OLDER PEOPLE**

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**Purpose:** Walking is suggested to be offering health gains. The World Health Organization recommended walking for at least thirty min daily to maintain individuals’ health. Moreover,
it is recognized that walking promotes cardiovascular health, especially for the older
people. The purpose of this study is to identify the impacts of physical activity walking on
cardiovascular health from current literature. **Methods:** A review of literature was adopted
in this study. Literature related to the topic between years 2007-2012 was searched using
the following databases: PubMed, ProQuest, Medline, Cinahl and Embase. Results focusing
on the impact of physical activity by walking on cardiovascular health were retrieved
and reviewed. **Results:** The review of literature showed significant impact of walking on
cardiovascular health. Walking programs were well tolerated by patients with chronic
disease and walking maintained or increased the cardiovascular function of these patients.
The cardiorespiratory fitness was suggested to be improved among diabetes patients who
joined for a 24 weeks walking intervention. Also, individuals with low walking speed were
identified to have an increase risk of cardiovascular death. Moreover, an increase in walking
steps per day could decrease the systolic and diastolic blood pressure that reduce the morbidity
and mortality related to cardiovascular disease. **Conclusion:** It is concluded that walking
contribute to cardiovascular health. Thus, it is recommended that health promotion targeting
on increasing the walking level among older people should be encouraged as to improve
cardiopausal health. **Keywords:** Physical Activity; Cardiovascular; Walking; Diabetes.

**EFFECTS OF REGULAR PHYSICAL EXERCISE AND DIETARY INTAKE ON
ANTIOXIDANT STATUS AND CARDIOVASCULAR RISK IN ELDERLY WOMEN**

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The decline of metabolic function in elderly increases the risk of oxidative stress, leading
to cardiovascular diseases. Adequate physical activity and well-balance diet would help to
reduce this risk. This study aimed to compare regular physical exercise effects and biomarkers
in blood including antioxidant status and the risk of cardiovascular disease markers in
relation to dietary intake. A cross-sectional study was conducted in sedentary elderly women
(SE, n = 17), exercising elderly women (EE, n = 26), sedentary young women (SY, n =
37) and exercising young women (EY, n = 12). All exercising women had exercise activity
at least 3 hours/week for a year. All participants completed 4-day dietary intake records.
Blood was collected on day 5. Factorial ANOVA tests were done regarding to elderly and
exercise status. We found that total antioxidant status (TAS) and cardiovascular risk marker
-homocysteine (tHcy)- in plasma were significantly and independently dependent on elderly
and exercise status. Elderly group had higher TAS and tHcy, compared to young group (p <
0.01). EE had higher TAS compared to SE, EY and SY (p < 0.001), and higher antioxidant
enzyme - erythrocyte glutathione peroxidase activity - compared to SY and EY (p < 0.05).
SE had higher tHcy compared to EE, EY and SY (p < 0.01). We found that TAS in plasma
was related to daily vitamin C intake (r = 0.231, p = 0.026), while tHcy was related to the
decrease of plasma HDL concentration (r = -0.269, p = 0.015). No differences were shown
on lipid peroxidation marker (TBARS), plasma ascorbate, erythrocyte superoxide dismutase
activity. In conclusion, elderly women had higher risk of cardiovascular diseases compared to
younger women. However, regular exercise would help to reduce the risk of cardiovascular
diseases and increase antioxidant protection status in elderly women. **Keywords:** Exercise;
Diet; Cardiovascular; Stress; Physical Activity.
BIOPHYSICAL ASSESSMENT PROTOCOL IN A HEALTHY EXERCISES PROGRAM FOR SENIORS
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Enjoyment of exercise is one of the health benefits that can be obtained when someone starts planning functional exercise. The constructive use of leisure through sports and recreational activities promotes assessment and activity monitoring. Before doing any sport or physical activity (PA), a person must agree to perform a series of assessments, to make PA safer and personalized. There are usually no evaluation (nutritional, postural, biomedical, physical attributes) prior to PA initiation in adults. Methods: People (enrolled in the program over 55 years at the University of Malaga, Spain) were evaluated through monitoring the biophysical attributes. We reviewed the family and personal history. Doctor assessed through traffic light colours (red, orange and green) the following parameters: age, sex, weight, height, waist-hip ratio, blood pressure, resting heart frequeats; and tests: dynamometry of hands, tapping hands, balance, step test, vertical jump, jump length, throwing the ball, speed test circuit, test obstacles. Finally, our team developed a functional PA program to improve the results of initial tests. Aims: To create a new PA program with some functional exercises. Depending of the level of PA of the person, it assigned one traffic light colour (red, orange, green). Results: In the pilot study, we improved biomedical variables and we have designed an evaluation sheet for the persons. 15% of the subject didn’t know they have health problem such as overweight or high blood pressure. Our design, where we highlight the use of a color scale to the person, liked all people and they improve their motivation to PA. Conclusion: PA can not only reduce the risk of disease, but to be an effective tool to improve the health of the person. To prescribe a functional exercise is necessary to know its biological and fitness status. Keywords: Biophysical; Exercise; Seniors;.

PERSONAL TRAINING FOR OLDER ADULTS TO BE ACTIVE AND HEALTH PEOPLE
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Cardiovascular diseases (CVDs) are the first cause of death. People can reduce their risk of CVDs by engaging in regular physical activity. Exercise can improve and prevent chronic diseases suffered by people. Purpose: To explore the improvement of the physical qualities. Methods: 58 subjects (22 males and 36 female), with range age were 44-76yrs, participating during 12 months period. They were divided into 2 groups: back school (BS) and therapeutic group (T). Each case was compared with its previous control at the beginning of the personal training activity. Information on exposure to risk factors was obtained by a structured questionnaire. Data were collected in our sport medical complex (weight, height, body mass index (BMI), waist hip index, blood pressure and resting heart rate). They developed some tests: hand dynamometry, arms tapping, vertical and horizontal jump, ball launching, step test, speed and Ruffier test. Results: Significant differences were found between T and BS groups (p < 0.05). Data in T group were in blood pressure, weight, height, BMI, waist-hip index and Ruffier index test in males: 15.7 ± 1.4 and 8.6 ± 0.9mm Hg; 83.9 ± 0.8kg; 1.67 ± 0.01m; 30.02 ± 0.05kg/m²; 1.04 ± 0.1m; 5.40 ± 1.5points; respectively, and in females: 13.3
± 1.7 and 8.0 ± 0.2mm Hg; 73.6 ± 9.7kg; 1.60 ± 0.10m; 30.0 ± 7.5kg/m²; 0.70 ± 0.10m; 5.20 ± 6.3 points; respectively. Data in BS group were in blood pressure, weight, height, BMI, waist-hip index and Ruffier index test in males: 13.7 ± 2.3 and 8.1 ± 0.62mm Hg; 86.0 ± 11.6kg; 1.70 ± 0.08m; 29.1 ± 3.31kg/m²; 1.00 ± 0.05m; 25.63 ± 11.32kg/m²; 0.86 ± 0.07m; 10.4 ± 4.6 points. Conclusion: Our results confirm the importance of therapeutic group sport activities. Specific programs improved CVDs risk such as blood pressure and Ruffier test. Keywords: Personal Training; Physical Activity; Chronic Diseases; Blood Pressure.

CHEST HEART & STROKE SCOTLAND ADVICE LINE: A GATEWAY FOR CINDERELLA TO RETURN TO THE BALL!

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Chest Heart & Stroke Scotland (CHSS) Advice Line nurses provide information, advice and support to patients and carers living with chest, heart and stroke illness in Scotland, and health professionals. The Advice Line is accredited with The Helplines Association. Chronic Obstructive Pulmonary Disease (COPD) is often seen as a “Cinderella” condition in an ageing population. Life may not be a ball with COPD, but the Advice Line nurses support people to improve their quality of life with self-management strategies and physical activity. CHSS Advice Line nurses answer telephone calls and enquiries by email, text message and through Facebook and Twitter. Providing a supportive, listening ear with no time limit to calls, they give confidential, practical and independent information and advice based on up-to-date Scottish and UK guidelines (eg. SIGN and NICE). Ella (age 70) was diagnosed with COPD and phoned the Advice Line feeling anxious and frequently breathless. Previously Ella had enjoyed going dancing with her husband Harry but with COPD, she believed her dancing days were over. The Advice Line nurse: answered Ella’s questions and advised her how to cope with breathlessness and fatigue, and prevent chest infections; recommended Ella ask her GP for referral to a pulmonary rehabilitation class; sent her CHSS booklets and factsheets, and a DVD of COPD exercises; referred her to a CHSS chest group for weekly exercises and social support. Ella felt rejuvenated by being more active and soon joined Chest Voices Scotland to help shape her local respiratory health services. The Advice Line nurse referred Ella to the CHSS Personal Supports Grants Officer, she received a holiday grant, and once again she danced with Harry. The Advice Line was the gateway through which Ella improved her life, enabling and empowering her to manage her COPD and actively change her from a state of breathlessness and anxiety to dancing away the afternoon with her Prince Charming! Keywords: Helpline; Chronic Obstructive Pulmonary Disease; Scotland.

HYPERTENSION IN OLDER ADULTS: PERCEPTIONS OF MORBIDITY AND FACTORS ASSOCIATED WITH TREATMENT

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High Blood Pressure (HBP) is a disease of slow clinical and asymptomatic nature, which often is associated with functional changes, structural changes in target organs and metabolic changes, with consequent increased risk of cardiovascular events. HBP is a disease that most stands out among the elderly in Brazil, with ratios around 50% and in the adult population,
an estimated prevalence of around 20%. Changes in lifestyle are effective in the prevention and control of HBP, with improved antihypertensive efficacy and reduced cardiovascular risk associated. The study objective was to estimate the prevalence of hypertension in the elderly in the municipality of Jaborandi / SP, assessing sociodemographic, clinical, physical activity and quality of life (QOL). It is a descriptive cross-sectional survey that used the questionnaires as instruments: Mini Mental State Examination; Demographic, socioeconomic and clinical; Baecke modified for the elderly and hypertensive-specific QOL. The variables were analyzed by Fisher’s Exact Test, considering significant p < 0.05. We evaluated 82 elderly, 48 women (58.54%) and 34 men (41.46%), most of the age group 60-69 years (45.12%), Caucasian (84.14%), with low educational level (mean 3.01 years of schooling), low income: Class D (54.88%) and class E (31.71%) and 82.93% of elderly retirees. The prevalence of HBP was 75.60% (77.08% in women and 73.53% in men). Significantly associated variables: HBP by waist circumference (.011), HBP and medication by Classification of blood pressure (BP) (< 0.001), HBP by private health plan (0.03), QOL by poor mental health in 30 day (0.032), QOL by Alcoholism (0.023), QOL by Smoking (0.005) and QOL by Number of drugs in use in 3 months (0.018). The results indicated that health education is essential for the patient, being instructed on the principles on which it is based treatment can exercise adequate control of BP aiming at a better quality of life. Keywords: Hypertension; Perceptions; Morbidity; Treatment; Physical Activity.

SPINAL MOBILITY AND LUNG FUNCTION: THE ACUTE EFFECT OF PILATES ON VITAL CAPACITY

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Background: As people age, their spine and rib cage progressively increase in stiffness, with concurrent increases in kyphotic posture. These changes can limit the maximum voluntary expansion of the lungs, and thus decrease overall lung function. Exercise has been shown to increase mobility of the spine and rib cage and may improve lung function. Pilates is a program of exercise that may improve spinal flexibility, but the immediate effects of this program on lung volumes has not been investigated. Method: Older adults (66±6yrs) who were currently enrolled in a Pilates program were recruited to participate in this study. Participants attended for a familiarization session and then one week later attended for testing. Height, BMI and lung volume (as measured by vital capacity VC) pre and post a single 60 min Pilates training session were measured. Paired t-tests were undertaken to compare VC measurements (pre and post) using Microsoft excel. Results: 17 adults (4 male) consented to participate in the study. These adults had been participating in Pilates classes at least weekly for a minimum of 6 months. Mean volumes (SD) were 3.3L (0.9) pre and post class with no differences (P = 0.382) recorded. As a group, mean VC was 114.35% (SD 15.9) of the population norms. Discussion: No significant differences were observed in vital capacity pre and post a single Pilates session. It may be that improvements in thoracic cage and spine mobility require longer term interventions to produce results. Alternatively, this population may have already had improvements in their spinal mobility, as lung volumes were higher than population norms. Conclusion: One Pilates session does not appear to significantly change lung volumes in a population who have already been participating in Pilates. Further research into longer term effects of Pilates in older adults who do not have experience in Pilates is warranted. Keywords: Kyphotic Posture; Lung Function; Pilates; Flexibility.
EFFECT OF SELECTED EXERCISES ON PHYSICAL, PHYSIOLOGICAL AND PSYCHOLOGICAL VARIABLES AMONG MIDDLE AGED WOMEN

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Introduction: India had seen a woman only as a member of the family or a group-as daughter, wife, or a mother and not as an individual with identities or rights of her own. Today’s Indian women are more independent and conscious of their need to be physically fit, mentally alert and emotionally stable. A sound exercise programme throughout life can reduce some of the common effects of ageing. The present study assessed the effect of selected exercises (12 weeks) on hundred middle aged women, between 50-60 years with a mean and SD of 54.55 + 3.46, selected at random from Varanasi, India. It was hypothesized that there would be significant differences on physical, physiological and psychological variables due to the training. Method: Standardized tests were applied to measure physical (flexibility, cardiovascular endurance, muscle strength, static balance, reaction time, speed of movement and frequency of movement ), Physiological (resting pulse rate, blood pressure, vital capacity, resting respiratory rate, fat percentage, breath holding capacity and blood sugar level) and psychological (anxiety [Sinha’s Anxiety Scale] and depression [Beck’s depression Inventory] variables. Results: Analysis of Co-Variance (ANCOVA) was applied and tested for significance at 0.05 level of confidence. Significant difference was found in flexibility, cardiovascular endurance, muscle strength, static balance, reaction time, speed of movement and frequency of movement for experimental group. Further resting pulse rate, blood pressure, vital capacity, resting respiratory rate, fat percentage and breath holding capacity of experimental group had improved. Finally in the component if psychological variables the present sample improvement upon anxiety management and reduced depression. Conclusion: The present finding is an eye opener for Indian women to realize the significance of exercise in their life and live a dignified life at a later stage. Keywords: Exercise; Physical; Physiological; Psychological.

MODIFIED THAI YOGA ON A DAILY BASIS AND ITS BENEFICIAL EFFECTS ON CARDIOVASCULAR SYSTEM

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Thai Yoga (TY) is related to mind-body exercise; Yoga and Tai Chi which are already accepted having therapeutic value. Traditionally, TY is held to result in functional integration at the highest level of spirituo-psycho-somatic development in the mind and brain simultaneously. In order to examine which brain regions change activation in response to exercise, the application of different neuroimaging techniques would be beneficial as a promising oxygen consumption for investigating the effects of exercise on cardiovascular systems. The aim of this study was to evaluate the acute effect of a single bout of TY on cardiovascular systems. Subjects were asked to get expired-air that was used to obtain oxygen consumption (VO2), respiratory rate (RR, time/min), tidal volume (Vt, L) and Min ventilation (VE, L/min). Mean scores were reported for each of the eighteen poses involved in TY. These findings have practical implications for improving modified Thai Yoga for people, and conducting programs on a daily basis. The most people could consider their pose the most suitable place to practice modified Thai Yoga that the postures were useful because the activity integrated
processes in a practical way, and also promoted effective breathing. **Keywords:** Thai Yoga; Cardiovascular; Oxygen Consumption; Exercise.

**EFFECTS OF A 12-WEEK MULTI-COMPONENT EXERCISE INTERVENTION ON PHYSICAL AND BIOMETRICAL COMPONENTS IN ASSISTED-LIVING RESIDENTS**

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**Introduction:** Exercise can be an important contributor to the health of elderly adults. The study aims at measuring change in strength, agility, balance, and biometric components of assisted-living population exposed to a 12-week multi-component exercise intervention.

**Methods:** Twenty-four elderly adults (Mean age = 84±7 years) from two separate assisted-living facilities were randomly divided into an intervention and control groups. Variables of interest were upper body strength, agility, balance and biometric measures (Total Cholesterol, HDL, LDL, TRG, TCHDL, and Glucose). Intervention subjects practiced bi-weekly, 45-60 min each session. **Statistical Analysis:** Repeated measures ANOVAs (group x pre-post) were performed for each variable, and standardized effect sizes (SES) were computed to estimate intervention effect.

**Results:** Moderate to strong SES were revealed for the modified Berg Balance (SES = .49), Chair Sit-and-Reach (SES = .31), 8ft Up and Go (SES = .57), 2minWalk-in-Place (SES = 1.02), T. Chol (SES = 0.41), HDL (SES = .40), LDL (SES = .43), and TRG (SES = -1.27), but not for the other variables. The group by time interaction significance level for the above variables ranged between p = .09 -.20 due to sample size.

**Discussion:** Findings indicate that during structured intervention meaningful and positive physical and biometrical changes can be obtained in the elderly population. Results should be interpreted with caution due to small sample size that resulted in insufficient power for obtaining significance. More studies are required to infer generalizability. **Keywords:** Intervention; Physical and Biometrical Components; Elderly; Balance.

**IS BODY MASS INDEX ASSOCIATED WITH 3-YR CHANGES IN PHYSICAL CAPACITY IN WELL-FUNCTIONING OLDER INDIVIDUALS: THE NUAGE STUDY**

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**Background:** Forty% of Canadians >60 years old report at least one type of physical disability; mobility impairment being the most common. In addition, the prevalence of overweight and obesity in older adults is increasing. In comparison to their normal weight counterparts, older obese individuals are at greater risk of impaired physical capacity. However, few longitudinal studies have explored the association between body mass index (BMI) and changes in physical function in older individuals. **Objective:** To investigate the association between baseline BMI and changes in physical capacity over 3 years. **Research methods:** Data from 342 well-functioning older men aged between 68 and 82 yrs from the longitudinal study NuAge were analyzed. Dependent measures were the changes in physical capacity tests. Regression analyses were performed to investigate if baseline BMI was associated with changes in physical capacity over 3 yrs after controlling for age, Short Form Health Survey questionnaire (SF-36), functional autonomy, physical activity
scale for elderly (PASE), number of diseases, and waist circumference. **Results:** Baseline BMI ranged between 17.2 and 51.2 kg/m² (mean = 28.1 ± 4.2 kg/m²). Mean changes in the results of the physical capacity tests were significant over 3 years follow up: time up and go (M = 0.48; SE 0.11), chair stand (M = 0.99; SE 0.20), walking speed at fastest pace (M = -0.04; SE 0.01), and one leg stand (M = -4.62; SE 0.92). Before and after adjustment for potential confounders, no significant association was observed between baseline BMI and changes in physical capacity after the 3-year follow-up (R² between 0.0009 and 0.0123).

**Conclusion:** Our data showed that baseline BMI was not a predictor of changes in physical capacity in our cohort of well-functioning older men. However, 3 years is a short period of time to evaluate the effects of BMI on physical capacity, longer studies would be needed to clarify these findings. **Keywords:** Body Mass Index; Physical Capacity; Autonomy; Speed.

**HAPPINESS IS A DETERMINANT OF PHYSICAL ACTIVITY LEVELS AMONG ETHNICALLY DIVERSE OLDER ADULTS**

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**Background:** Identifying the determinants of physical activity is becoming increasingly important as the population of Canada ages. Physical inactivity is associated with functional limitations and chronic disease. While depression and stress levels are associated with lower levels of physical activity, little is known about the influence of happiness on physical activity levels, particularly among ethnically diverse groups. **Purpose:** To determine whether happiness is a determinant of physical activity among an ethnically diverse group of older adults living in an urban center in Canada and to examine sex differences in this relation.

**Methods:** Data from an ongoing intervention study were used for purposes of the current analysis. Participants were men (n = 30) and women (n = 136) between the age of 55-87 who lived in low-income urban neighbourhoods. Upon recruitment in the study, all participants completed the Subjective Happiness Scale (SHS), the Healthy Physical Activity Participation Questionnaire and provided relevant demographic information. Multiple linear regression models were performed using physical activity as an outcome and SHS as the main exposure variable. Age, sex, marital status and education were controlled for in fully adjusted models.

**Results:** Fully adjusted models accounted for 15% of the variance in the overall sample, 54% of the variance among males and 14% of the variance among females. A significant and positive association between physical activity and happiness was noted in the overall sample (beta = 0.34), males (beta = 0.83) and females (beta = 0.24). **Conclusions:** Subjective happiness is a determinant of physical activity levels among ethnically diverse older adults with a stronger association for males compared to females. As such, focusing on improving happiness in this population, particularly among men, may be essential for lifestyle change. **Keywords:** Happiness; Physical Activity; Ethnicity; Urban; Sex.

**INDIVIDUALLY ADJUSTED PHYSICAL ACTIVITY FOR INACTIVE ELDERLY PERSONS, INVITED TO A “HOUSE OF HEALTH” SETTING: AN RCT**

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There is overwhelming evidence showing that physical activity is crucial for health and physical function in old age. Consequently, it is extremely important to reach people at risk of functional decline in time. The concept Control of Function in a House of Health setting
focuses on both physical and social activities. The aim of this study was to describe the effect of individually tailored advice and physical training, within the concept Control of Function, on activity patterns, endurance, quality of life and consumption of care in inactive elderly people. **Methods:** Sixty persons were randomized to either intervention or control group. Criteria of inclusion: Age ≥75 years, living in the community, able to walk and manage stairs, low level of physical activity. Criteria of exclusion: Severe health problems, need of help with ADL. Activity level (six-grade scale, FAI), endurance (six min walking test), falls efficacy (FES-I) and quality of life (SF36) were evaluated at baseline and after six months of intervention, and consumption of care after another year. The intervention, based on a check up by a physiotherapist followed by goal setting together with the participant, included training programmes and activities, also social. Training facilities were offered in the house, i.e. gym and group activities, but also in the community, and continuous follow-ups were performed. **Results:** The intervention group improved significantly more than the control group regarding endurance, and positively changed their attitude towards exercise to a significantly greater extent. Consumption of care is still to be followed up and will be presented at the congress. **Conclusion:** The results demonstrate positive effects of the concept Control of Function in a House of Health setting, but more studies with a greater number of participants are needed. **Keywords:** Physical Activity; Function; Endurance; Quality of Life.

**A PROFILE OF OUT-OF-HOME MOBILITY AND USE OF NEIGHBORHOOD ENVIRONMENTS FOR SENIORS IN TAIWAN**

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The potential losses and physiological changes associated with aging may hinder the mobility of older adults. However, as mountain of evidence has demonstrated, regular physical activity is strongly related to the health of seniors, especially physical activity that is a natural part of their lifestyle, and therefore, it is crucial to understand the motives for out-of-home mobility with regards to the daily activities of seniors. This study presents a profile of out-of-home mobility that includes the motives for going out and the frequency of each trip, combined with an evaluation of the neighborhood environment and the utility. A valid total of 155 voluntary older adults from Tainan city, Taiwan, participated in this study. The results revealed that exercise is the top motive for out-of-home trips, followed by social activities and doing grocery shopping. The most popular sites for doing leisure-time physical activity are parks. The participants reported that they visit parks in a very regular basis and that they generally walk to parks by themselves, with most of them staying in the park between a half hour and one hour. Implications are provided in terms of methods to enhance the mobility of older adults. **Keywords:** Neighborhood; Physical Activity; Motives; Mobility.

**CAUSAL RELATIONSHIPS BETWEEN SOCIO-ECONOMIC STATUS, PHYSICAL HEALTH AND LONG-TERM CARE NEEDS AMONG THE JAPANESE URBAN ELDERLY**

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**Introduction:** After the Japanese government implemented public long-term care (LTC) insurance in 2000, the demand for LTC services has steadily increased. This chronological
study aimed to explore the causal relationships between socio-economic status (SES), physical health and LTC needs among the urban elderly in Japan. **Methods:** A questionnaire survey was conducted to all residents aged 65 years and older in an urban Newtown area of Tokyo in 2001 and a follow-up study was conducted in 2004. In all, 7,905 respondents to both surveys were included as analysis subjects. Data analysis was performed using Chi-squared test and Structural Equation Modeling (SEM). In the SEMs, one observed variable (LTC needs in 2004) and three latent variables (SES in 2001 and physical health in both 2001 and 2004) were used. **Results:** Among all variables, physical health in 2004 was the strongest determinant of LTC needs, followed by physical health in 2001 and SES in 2001. The results also indicated that the indirect effect of SES on LTC needs via physical health in 2001 and 2004 was higher than the direct effect. The final model fitted the data well: NFI = 0.982, CFI = 0.983 and RMSEA = 0.044, and showed that the LTC needs explained by SES in 2001, as well as physical health in both 2001 and 2004 were large (R² = 0.67). **Conclusions:** Our results indicated that good physical health directly contributed to reducing LTC needs among Japanese elderly. In addition, efforts to increase income and educational levels may to decrease LTC needs by indirectly improving physical health. **Keywords:** Socio-economic; Health; Urban; Japanese; Causal Relationships.

**AGEING AND HEALTH ON A GENDER PERSPECTIVE: A STUDY ON NATIONAL HEALTH SURVEY (NHS) DATA IN PORTUGAL**

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The aging population brings new challenges related to health. One question concerns gender, that is, the different health conditions of men and women and how they manage strains and mobilize resources, as they get older. Gender refers to the culture-bound convention about norms for – and relationships between – women and men, and affects most areas of human existence, including health. In the analysis of equity in health and health care use, gender points out to a particular kind of inequity, which results from wider inequalities such as social, economic, cultural or other that exist between women and men. The health status of people in later life depends, in part, on the health capital built up over a lifetime, but also on the resources, capacities and in the individual current context. Therefore, it is appropriate to identify and analyze the similarities and differences in health needs between men and women, as well as identify and analyze the gender-based obstacles that prevent women and men from realizing their potential health. This research aims at determining and analyzing the relevance of gender on health status and health care utilization of the population above 50 years old, in Portugal, based on the data of the National Health Survey (NHS), which provides population representative data in health. In search for relevant associations between these demographic, social and economic characteristics and men and women’s health status and use of health care, health typologies will emerge, representing specific population groups. This research will be complemented later by qualitative data gathered from in-depth interview that explore particular aspects of this phenomenon, and provide different information and knowledge on the same subject. A gender analysis in health and in health care among Portuguese above 50 years old may provide fundamental and practical
answers to this issue and provide knowledge, to adequate public policies and improve quality in services. **Keywords:** Health; Gender; Portugal; Cultural; Economic.

**IMPACT OF AGEING WELL: A LOTHIAN WIDE PEER SUPPORT PHYSICAL ACTIVITY AND WELLBEING PROJECT FOR INACTIVE ADULTS AGED 50+**

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**Introduction:** By 2033, the predicted increase in the pensionable aged population in the Lothians is 41.03%, 9.63% above the projected Scottish average. This will have an impact on NHS and public services given the preventable nature of many long-term conditions and the increasing use of services by 45-75 year olds. Good physical and mental health, quality of life and the ability to live independently are closely linked. The 2010 Scottish health survey reports low levels of physical activity (<30 min of moderate or vigorous activity per week) in the 65+ demographic; 46% of men aged 65-69, 84% aged 85+, and 44% and 91%, respectively, with older women. **Project:** Ageing Well is a Lothian wide project aiming to maintain and promote physical and mental health and wellbeing and quality of life for inactive adults aged 50+. Physical activity is a key component. Over 1000 individuals take part annually. It is a peer support model where volunteers lead, encourage and provide information to aid their peers in adopting a more active and healthy life. **Impact:** Preliminary findings of a recent Social Return on Investment study show that the programme achieves a social impact of at least £435k (final report March 2012). Evaluations have shown that 85% of participants positively changed their attitude towards physical activity; 72% positively changed their behaviours; 79% had improved health and wellbeing; 88% of volunteers had improved health, 91% believed the programme enabled them to meet new people and 100% would recommend volunteering to others. A 2010 survey showed that 37% of participants met the recommended 30 min of physical activity most days, 26% above the aged 65+ Scottish average. Participants reported increased confidence, reduced social isolation and improved mental health. **Conclusion:** Ageing Well has shown to be an effective programme to improve the health and wellbeing of its participants and volunteers, increasing PA levels and reducing social isolation. **Keywords:** Physical Activity; Wellbeing; Inactive; Mental Health; Isolation.

**ENVIRONMENTAL FACTORS AFFECTING ELDERLY PHYSICAL ACTIVITY LEVEL: A REVIEW FROM URBAN PLANNING PERSPECTIVE**

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Physical activity (PA) is a strategy to improve quality of life. There is a plethora of studies that strive to discover crucial factors affecting level of PA in different sectors of society. This review aims to provide a holistic view of factors affecting elderly PA from urban planning perspective. A methodical literature search through scientific databases resulted in inclusion of 25 main articles. Various aspects (individual and environmental) of improving elderly PA level have been considered in these researches with predominant approaches from health and medicine disciplines in a disjointed fashion. However, close scrutiny from urban planning perspective reveals that the impacts of other environmental factors in micro and macro urban scale have been overlooked. At micro scale, urban design factors like enclosure, human scale, and legibility on elderly PA level have been neglected. Also, at macro scale, the impacts
of environmental variations in different parts of the city on elderly PA level have not well established. In this regard, the relation between environmental equality, as a fundamental factor which affects vulnerable people health, and elderly PA level has not been addressed in reviewed studies. Keywords: Physical Activity; Environmental; Urban; Vulnerable.

YOGA IN THE PREVENTION AND SELF MANAGEMENT OF THE CONDITIONS ASSOCIATED WITH OLD AGE: 1. STANDING POSES

Agarwal, Shashi

Agarwal Health Center, United States

Introduction: Yoga is practiced by millions all over the world. Having being practiced for more than 5000 years in India, its popularity in the West has steadily grown given its extensive health benefits. These include improved flexibility, strength, posture, mood, concentration, and relaxation. Medical benefits are seen in hypertension and other cardiovascular diseases, asthma, arthritis, insomnia, depression and many other health conditions. The Yoga Sutras (aphorisms) describe eight limbs of yoga practice: yama (moral behavior); niyama (healthy habits); asana (physical postures); pranayama (breathing exercises); pratyahara (sense withdrawal); dharana (concentration); dhyana (contemplation); and samadhi (higher consciousness). Commonly practiced yoga sutras in the western world include physical postures, breathing exercises and meditation. Methods: Several hundred yoga poses were reviewed from several yoga texts. Twenty simple postures with the most benefit and safety for seniors were picked for this four-poster presentation. Results: The following five standing poses should be done first in this four-sequence yoga session. These postures will be illustrated and their mode of performance and benefits described in the poster: 1. Mountain Pose (Tadasana) 2. Tree Pose (Vrksasana) 3. Triangle Pose (Trikonasana) 4. Warrior I Pose (Virabhadrasana I) 5. Warrior II Pose (Virabhadrasana II). Conclusion: Selected yoga postures can be regularly performed by the elderly. Yoga can be an excellent active method in the prevention and self-management of the conditions associated with ageing. It is simple to learn, easy to perform and is virtually free of any harmful effects. It has been associated with excellent adherence. Regular performance of these postures can be highly rewarding in the elderly. Keywords: Yoga; Self-Management; Meditation; Breathing; Standing.

YOGA IN THE PREVENTION AND SELF MANAGEMENT OF THE CONDITIONS ASSOCIATED WITH OLD AGE: 2. SITTING DOWN POSES

Agarwal, Shashi

Agarwal Health Center, United States

Introduction: Yoga is practiced by millions all over the world. Having being practiced for more than 5000 years in India, its popularity in the West has steadily grown given its extensive health benefits. These include improved flexibility, strength, posture, mood, concentration, and relaxation. Medical benefits are seen in hypertension and other cardiovascular diseases, asthma, arthritis, insomnia, depression and many other health conditions. The Yoga Sutras (aphorisms) describe eight limbs of yoga practice: yama (moral behavior); niyama (healthy habits); asana (physical postures); pranayama (breathing exercises); pratyahara (sense withdrawal); dharana (concentration); dhyana (contemplation); and samadhi (higher consciousness). Commonly practiced yoga sutras in the western world include physical postures, breathing exercises and meditation. Methods: Several hundred yoga poses were reviewed from several yoga texts. Twenty simple postures with the most benefit and safety
YOGA IN THE PREVENTION AND SELF MANAGEMENT OF THE CONDITIONS ASSOCIATED WITH OLD AGE: 3. LYING FACE DOWN POSES

Agarwal, Shashi

Agarwal Health Center, United States

Introduction: Yoga is practiced by millions all over the world. Having being practiced for more than 5000 years in India, its popularity in the West has steadily grown given its extensive health benefits. These include improved flexibility, strength, posture, mood, concentration, and relaxation. Medical benefits are seen in hypertension and other cardiovascular diseases, asthma, arthritis, insomnia, depression and many other health conditions. The Yoga Sutras (aphorisms) describe eight limbs of yoga practice: yama (moral behavior); niyama (healthy habits); asana (physical postures); pranayama (breathing exercises); pratyahara (sense withdrawal); dharana (concentration); dhyana (contemplation); and samadhi (higher consciousness). Commonly practiced yoga sutras in the western world include physical postures, breathing exercises and meditation. Methods: Several hundred yoga poses were reviewed from several yoga texts. Twenty simple postures with the most benefit and safety for seniors were picked for this four-poster presentation. Results: The following five lying face down poses should be done third in this four sequence yoga session. These poses will be illustrated and their mode of performance and benefits described in the poster: 1. Cobra Pose (Bhujangasana) 2. Plank Pose 3. Cat Pose (Marjaryasana) 4. Cow Pose (Bitilasana) 5. Downward facing Dog Pose (Adho Mukha Svanasana). Conclusion: Selected yoga postures can be regularly performed by the elderly. Yoga can be an excellent active method in the prevention and self-management of the conditions associated with ageing. It is simple to learn, easy to perform and is virtually free of any harmful effects. It has been associated with excellent adherence. Regular performance of these postures can be highly rewarding in the elderly. Keywords: Yoga; Self-Management; Breathing; Meditation; Lying Down.

YOGA IN THE PREVENTION AND SELF MANAGEMENT OF THE CONDITIONS ASSOCIATED WITH OLD AGE: 4. LYING FACE UP POSES

Agarwal, Shashi

Agarwal Health Center, United States

Introduction: Yoga is practiced by millions all over the world. Having being practiced for more than 5000 years in India, its popularity in the West has steadily grown given its extensive health benefits. These include improved flexibility, strength, posture, mood, concentration,
and relaxation. Medical benefits are seen in hypertension and other cardiovascular diseases, asthma, arthritis, insomnia, depression and many other health conditions. The Yoga Sutras (aphorisms) describe eight limbs of yoga practice: yama (moral behavior); niyama (healthy habits); asana (physical postures); pranayama (breathing exercises); pratyahara (sense withdrawal); dharana (concentration); dhyana (contemplation); and samadhi (higher consciousness). Commonly practiced yoga sutras in the western world include physical postures, breathing exercises and meditation. **Methods:** Several hundred yoga poses were reviewed from several yoga texts. Twenty simple postures with the most benefit and safety for seniors were picked for this four-poster presentation. **Results:** The following five lying face up poses should be done fourth in this four sequence yoga session. These postures will be illustrated and their mode of performance and benefits described in the poster: 1. Reclining Big Toe Pose (Supta Padangusthasana) 2. Baby Pose (Anand Balasana) 3. Lying Abdominal Twist Pose (Supta Udkarshansana) 4. Bridge Pose (Setu Bandha Sarvangasana) 5. Corpse pose (Savasana). **Conclusion:** Selected yoga postures can be regularly performed by the elderly. Yoga can be an excellent active method in the prevention and self-management of the conditions associated with ageing. It is simple to learn, easy to perform and is virtually free of any harmful effects. It has been associated with excellent adherence. Regular performance of these postures can be highly rewarding in the elderly. **Keywords:** Yoga; Self-Management; Breathing; Meditation; Lying Up. 

**IMPACT OF EXERCISE AND ISOFLAVONES ON BODY COMPOSITION AND METABOLIC PROFILE**

Perreault, Karine; Riesco, Eleonor; Aubertin-Leheudre, Mylène; Choquette, Stéphane; Barsalani, Razieh; Barsalani, Razieh; Dionne, Isabelle J.; Dionne, Isabelle J.

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Benefits of exercise on postmenopausal women’s health are well known. But the combination of exercise with isoflavones has been less explored, although few scientific articles have announced promising perspectives. For the last 5 y, two clinical trials addressing the potential benefits of exercise combined with isoflavones has been conducted at the University of Sherbrooke in Canada. This poster aim at presenting the results of several analyses derived from these trials. Four main categories were identified: body composition (DXA), muscle indexes (muscle strength and quality), cardio-metabolic and hepatic profile (fasting blood dosages), and quality of life (SF-36 questionnaire). According to the progress of the trials, sample sizes varied from 48 to 100 overweight-to-obese postmenopausal women (BMI 28-40 kg/m2). In all studies, the intervention consisted of a supplementation of soy isoflavones or placebo (70mg/d) combined with 6 to 12 mo of structured physical activity (EX+ISO or EX+PLA groups). We found that exercise combined with isoflavones reduced body weight (p < 0.05), total (p < 0.05) and trunk fat mass (p = 0.04) and increased appendicular (p < 0.05) and leg lean body mass (p = 0.031) after 6 mo of intervention, compared to exercise alone, but had no further effect on muscle strength and muscle quality. However, the isoflavones effect on body composition variables was no longer present at 12 mo. The addition of isoflavones to exercise brought favorable changes in GGT (hepatic enzyme) (p < 0.01), fatty liver index (p < 0.01), insulin resistance (p = 0.02) and serum triglycerides (p < 0.05). As for quality of life, the combination of isoflavones to exercise appeared to be a better strategy than exercise alone in order to improve several subscales of the SF-36 questionnaires (0.001 < P < 0.04). In conclusion, the addition of isoflavones to exercise seems to be an interesting way...
of improving physical and psychological aspects of overweight-to-obese postmenopausal women’s health. **Keywords:** Exercise; Isoflavones; Body Composition; Metabolic; Strength.

**IMPACT OF EXERCISE AND ISOFLAVONES ON BODY COMPOSITION AND METABOLIC PROFILE**

Riesco, Eleonor1; Choquette, Stephane2; Barsalani, Razieh1; Aubertin-Leheudre, Mylene3; Dionne, Isabelle J.1; Perreault, Karine1

1 Université de Sherbrooke, Canada; 2 Centre de recherche sur le vieillissement, Canada; 3 Université du Québec à Montréal, Canada

**Introduction:** The benefits of exercise on postmenopausal women’s health are well known and its combination with isoflavones – estrogenic compounds derived from plants – has recently been explored, with a few scientific articles announcing promising perspectives. During the last 5 y, two clinical trials addressing the potential benefits of exercise combined with isoflavones has been conducted at the University of Sherbrooke, Québec, Canada. **Objective:** This research work aims at presenting the overview of several analyses derived from these trials. **Methods:** Three main categories of variables were reported: body composition (DXA), cardio-metabolic and hepatic profile (fasting blood dosages), and quality of life (SF-36 questionnaire). Based on the progress of the trials, sample sizes varied from 48 to 100 overweight-to-obese postmenopausal women (BMI 28-40 kg/m²). In all studies, the intervention consisted of a supplementation of soy isoflavones or placebo (70mg/d) combined with 6 to 12 mo of structured physical activity (EX+ISO or EX+PLA groups). **Results:** We found that exercise combined with isoflavones, compared to exercise alone, reduced body weight (p < 0.05), total (p < 0.05) and trunk fat mass (p = 0.04) and increased appendicular (p < 0.05) and leg lean body mass (p = 0.031) after 6 mo of intervention, but had no further effect at 12 mo. The addition of isoflavones to exercise also brought favorable changes in GGT (hepatic enzyme) (p < 0.01), fatty liver index (p < 0.01), insulin resistance (p = 0.02), serum triglycerides (p < 0.05), and several subscales of the SF-36 questionnaires (0.001 < p < 0.04). **Conclusion:** The addition of isoflavones to exercise seems to be an interesting way of improving physical and psychological health in overweight-to-obese postmenopausal women. Altogether, these data emphasize the need to convey further investigations in order to better understand the synergetic effect of isoflavones and exercise. **Keywords:** Exercise; Isoflavones; Body Composition; Metabolic; Quality of Life.

**DIFFERENCES OF VO₂ IN THE EQUATION ROCKPORT ONE MILE TEST BETWEEN MEAN VS. MAXIMUM HEART RATE**

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VO₂ is a physiological variable that decreases progressively with age. An exercise prescription should include aerobic, muscle-strengthening, and flexibility exercises (ACSM, 2009). However, Rockport one-mile walk test protocol provides a valid sub-maximal assessment to estimate VO₂max (Kline, 1987). Researchers often use in the generalized equation the maximum heart rate (HR) in the final test, but the mean HR is rarely used in papers. **Purpose:** The aim of this study was to analyze the differences in the equation to determine VO₂ of Rockport test (Kline, 1987) between maximum HR (frequently used) and mean HR in +55-year-old people. **Methods:** 24 participants (12 males and 12 females) agreed to participate in this study (64.23 ± 4.81yrs; 68.6 ± 11.43kg; 161.0 ± 7.11cm). HR was
registered by means of 1Hz GPS devices (SPI10 and WiSPI, GPSPORTS, Australia). **Results:**

VO2 calculated with mean HR was higher (38.27 ± 7.92 ml/kg/min) than with maximal HR (34.28 ± 8.78 ml/kg/min; p < 0.001) in the generalized equation. According to Kline (1987), the first data obtained (with mean HR) belong to very good in the fitness classification according to age. The second data obtained (with maximum HR) belong to a good in the same classification. **Conclusion:** The main finding was that the variation of HR in Rockport test affects the VO2, improving the assessment of the test since more precise values are given. **Keywords:** Cardiovascular; Rockport Test; Heart Rate; Oxygen.

**INFLUENCE OF SEX AND OVERWEIGHT USING SOME INTEGRATION PATTERNS OF HEART RATE AND SPEED TO ESTIMATE VO2PEAK FROM ONE MILE TEST?**

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¹*University of Pablo de Olavide, Spain;* ²*University of Malaga, Spain*

Cardiorespiratory fitness (VO2peak) is one important variable associate with health and mortality on elderly. The Rockport test has been traditionally used to estimate VO2peak. However, there is not enough knowledge about its validity for aging people. One important limitation should be related with the integration pattern for heart rate (HR) and speed values (maximum final or mean values) that are included in the equation. Also, gender and obesity would be variables, which can modify the final estimation. **Purpose:** To explore the differences between estimated VO2peak from maximum and mean variables (HR and speed); also, to analyze the effect of gender and overweight. **Method:** Forty participants (16 males and 24 females) were selected for this study (64.2 ± 4.5yrs; 69.3 ± 11.0kg; 161.6 ± 7.4 cm). Body mass index (BMI) was used to classify overweight. All subjects performed the one-mile Rockport test; HR and speed were recorded with GPS device. VO2peak was estimated using the traditional Rockport equation; two VO2peak were estimated: VO2peakM, using maximum values of HR and speed; VO2peakA, using mean values. Repeated measures test were carried out to compare variables between gender and BMI groups. **Results:** Men were faster than women either mean (6.67 ±0.26 vs. 5.78 ±0.37 km/h, p < 0.05) or maximum speed (7.74 ±0.47 vs 6.79 ±0.98 km/h; p < 0.05). Men showed the highest mean (132 ± 14 vs 115 ± 20 beats/min) and maximum (152 ± 16 vs 132 ± 23 beats/min) HRs values. Between-groups effect was found on comparisons VO2peak for gender (males: 42.2 ±4.3 and 35.2 ±4.8 vs. females: 36.4 ±8.4 and 27.2 ±10.3 ml/kg/min; for VO2peakM and VO2peakA, respectively). **Conclusion:** Our data showed significant differences between estimated VO2peak, using different patterns of data integration, which should be a consequence of a non-steady-state pace during the test. These results may trade with the test validity, however more research must be necessary to clarify the physiological implications. **Keywords:** Sex; Overweight; Cardiovascular; Rockport Test.

**PHYSICAL ACTIVITY AND ASSOCIATED VARIABLES IN THE OLDEST OLD**

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In this cross-sectional epidemiological and household-based study we examined factors associated with physical activity level in all rural residents aged 80 + years in Antônio Carlos, Santa Catarina State, Brazil. A questionnaire was utilized and included information
on sociodemographic variables, health and lifestyle, and also body mass index. We used the Chi-square or Fisher’s exact one-sided, with $p \leq .05$. The mean age of participants was 84.3 ± 4.46 years and 57.3% ($n = 71$) were female. More than half (54.8%) performed less than 150 min per week of moderate activity, and the mean sitting time per day was 5.23 ± 2.11 hours. The oldest old who did not meet the recommendations of physical activity to health had a higher prevalence of cognitive impairment ($p = .04$), negative perception of health ($p = .03$), and spent more time sitting ($p = .03$). The relationship between low physical activity levels with poorer health perception and cognitive decline reinforces the importance of encouraging regular physical activity in the oldest old population, accompanied with adequate food, aiming for a healthier aging. **Keywords:** Physical Activity; Rural; Sociodemographics; Lifestyle; Body Mass Index.

**SEDENTARY BEHAVIOR AND SELF-PERCEIVED HEALTH IN BRAZILIAN COMMUNITY-DWELLING ELDERLY**

*Rodrigues Barbosa, Aline; Cararo Confortin, Susana; Aita Monego, Estela*

*Universidade Federal de Santa Catarina, Brazil*

The aim of this study was verify the association between sedentary behavior and self-perception health in community-dwelling elderly. Cross-sectional and household-based health survey with 477 elderly (60+ years), selected by simple random sample, in Antonio Carlos, southern Brazil (2011). Sedentary behavior was evaluated using one question of the International Physical Activity Questionnaire (median of the self-reported sitting time): $<$5 hours/day and $\geq$5 hours/day. Chi square test or Fisher exact test analyses were used to examine for associations between the sedentary behavior and self-perceived health: positive (excellent, very good, good) and negative (fair or poor). Two hundred sixty-two women (73.0 ± 8.6 y) and 196 men (73.3 ± 9.0 y) were examined. Positive self-perceived health was exceptional (96.9%, women and 92.3%, men). The percentages of elderly participants who self-reported prolonged sitting times (sedentary behavior) were 52.3% for women and 53.6% for men. A positive self-perceived health was observed in more than 90.0% of elderly who reported shorter or longer sitting times. There was no significant difference between the sedentary behavior and self-perceived health. **Keywords:** Sedentary; Perception; Health; Brazilian.

**BARRIERS TO PHYSICAL ACTIVITY IN RURAL, COMMUNITY-DWELLING ELDERLY**

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*Universidade Federal de Santa Catarina, Brazil*

The aim of this study was to identify barriers to physical activity in rural, community-dwelling elderly. This study is part of a wider project researching the effectiveness of actions of physical activity and nutrition among the elderly of Antônio Carlos, Santa Catarina State, Brazil. Semi-structured interviews were carried out with 36 individuals (7 men e 29 women) aged between 69 and 91 years old, selected (saturation sampling) from a random sample of 477 elderly members of the community. The interview script was prepared during preliminary epidemiology research. The interviews (August 2011), carried out in the municipality community centre, were recorded, and the transcripts analysed using the technique of content analysis. The main restraints reported were physical barriers and/or health problems, and the most common were: high blood pressure, diabetes, labyrinthitis, spinal problems (among the women) and heart problems. Fatigue and lack of motivation were also reported by the majority of the elderly as barriers for the practise of regular physical activity. The
lack of a partner or a group to perform physical activities was mentioned, but only by a few interviewees. The research reveals the need to invest in spreading information about the benefits of practising physical activity within this community, as well as the need to provide effective options for these individuals to practise physical activities. Promotion and intervention strategies should consider the barriers to the specific needs of older adults. **Keywords:** Barriers; Physical Activity; Rural; Municipality.

**CONTRIBUTING FACTORS TO BASIC MOBILITY IN OLDER ADULTS WITH DIABETES MELLITUS**

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**Background:** Diabetes mellitus (DM) is a major health concern, especially for the elderly. In addition to the common complications, older adults with DM are also likely to have balance impairments that could lead to mobility problems. The purpose of this study was to identify factors contributing to basic mobility in older adults with DM. **Methods:** Sixty-six community-dwelling older adults with DM participated in the study. The basic mobility tasks were 6-meter walk and 5 sit-to-stand tests. Three categories of factors were assessed. Non-modifiable factors included age and gender. Physiological factors included body mass index, visual contrast sensitivity, hand and foot reaction time, knee flexors and extensors strength and proprioception, and single leg stance time. Behavioral factors included living arrangement, use of walking aid, and number of medications, activity level, and nutrition. Blocked stepwise regression analysis forced entering the non-modifiable factors, then entering the physiological and behavioral blocks sequentially was conducted for the two mobility tasks separately. **Results:** For the 6 meter walk test, the mean was 6.52 s (±.48), and age, gender, visual sensitivity, hand and foot reaction time, and walking aid were found to be significant predictors ($R^2 = 47.6\%$). For the 5 sit-to-stand test, the mean was 14.22 s (±.35), and age, gender, single leg stance, foot reaction time, and use of walking aid were found to be significant predictors ($R^2 = 39.9\%$). **Discussion and Conclusion:** Walking and standing up from a seated position are essential abilities required for activities of daily living and were found to have declined in older adults with DM, compared to normal performance reported in the literature. There were some common as well as specific contributing factors to these two tasks that should be taken into consideration in the management of walking or sit-to-stand impairments in this population. **Keywords:** Diabetes; Mobility; Walking; Standing.

**THE HEALTH ASSESSMENT OF ELDERLY PEOPLE AND ITS RELATED FACTORS**

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**Introduction:** Success in family planning, development of primary health care, increase social and economic status and use of new technology was resulted to increasing older people in world. Health assessment includes functional ability, physical, mental and cognitive health and nutritional status has been consisted by American and British Geriatricians, This early assessment, screen and diagnosis will result in decreasing cost in health care, mortality rate and increasing cognitive and affect skills and functional autonomy. **Aim:** To determine of general health, nutrition, cognition, equilibrium and activity of daily living in
older people. **Method:** This is a descriptive-cross sectional study, 194 elderly people were assessed by questionnaire include demographic characters, General health questionnaire, Mini nutritional assessment (MNA), Mini mental status examination (MMSE), Tinetti test, Katz & Lawton. Data analysis was done by descriptive and inferential statistics (spearman, Kruskal-Wallis) by using SPSS (16). **Result:** Results showed that 17.5% of participants had relative suitable general health, 4% malnutrition, 0.8% moderate mental disorder, 18% abnormal static equilibrium, 4.6% abnormal dynamic equilibrium, and 3.1% had completely dependent in activity of daily living. General health with marital status (p < 0.01), education (0.048), Nutritional status with sex (p < 0.02), marital status (p < 0.02) and income status (p < 0.013). Cognitive status with age (p < 0.03), sex, marital status (p < 0.002) and education (p < 0.0001), Equilibrium with age (p < 0.001) and morbidity (p < 0.016), Activity of daily living with age (p < 0.0001), sex (p < 0.011), marital status (p < 0.0001), education (p < 0.0001). Income status (p < 0.0001) and morbidity (p < 0.005) had a significant correlation. **Conclusion:** The study showed that assessment of older people by health care professionals can help in detecting the high-risk patients and promote their caring. **Keywords:** Elderly; Health; Cognition; Activity.

**SIGNIFICANCE OF SPORT PRACTICE OF VOLLEYBALL FOR BRAZILIAN OLDER PEOPLE: ADHERENCE AND PERMANENCE**

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This study aimed to analyze the significance of sport practice of volleyball for Brazilian older people, Florianópolis, Santa Catarina State, Brazil. The study included 11 older people (eight women; = 69.5±4.8 years) practitioners of volleyball in the extension program of Federal University of Santa Catarina. The data were collected through semi-structured interview and questionnaire (adherence and permanence aspects), performed by content analysis. The meaning of volleyball is related to socialization, mood and well-being, health. Liking sport, invitation of friends or spouse, socialization, health, occupation of free time and medical indication was cited for adherence of sport practice of volleyball. The permanence motives the most related were liking sport, socialization, health and well-being. It was concluded that the categories analyzed for significance, adherence and permanence of volleyball practice showed interrelated to perception of physical, psychological and social benefits. Therefore, it’s expected that the results may contribute opportune reflection on the possibilities of the sport practice of volleyball for older people, encouraging effective participation in this population. **Keywords:** Sport; Volleyball; Adherence; Permanence; Brazilian.

**EFFECTS OF AN INTEGRATED PROGRAM OF PHYSICAL ACTIVITY IN A POPULATION OF WOMEN OVER 60 YEARS**

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**Introduction:** Arguably, there are two criteria are met in the aging process: 1) the probability of dying increases with age of the organism; 2) that the phenotype of every individual undergoes changes over time. Therefore, as part of the aging process, most physiological functions and physical lose efficiency (Chodzko-Zajko, W et al; 2009. Our goal is to work
through a new integrated system that allows globally affect the physical, psychological and sociological with the aging process are affected. **Methods:** The sample comprises a population of 18 women with a mean age of 72.28 years (± 3.39), an average height of 155.37 cm (± 6.19) and a weight of 71.12 kilos (± 11.59). To perform the study used the health questionnaire SF-12 in the version 2 (Alonso, J et al; 1995), the Senior Fitness Test (Rikli R et al; 1999) and a satisfaction scale. Also applied 27 sessions of cooperative type and form of games, twice per week with a duration of 1 hour per session. **Results:** As for the perceptual assessment of health, there are statistically significant improvements in general health (t = -2.474, P = 0.024), and a tendency to improve the vitality (t = -1.831, P = 0.085). With regard to fitness, there are significant differences in push-ups (t = -3.033, p = 0.008) and 6-min walk (t = -2.470, p = 0.024) between pre and posttest. In terms of satisfaction with the session, the majority (83.3%) considered a good organization of the sessions, as they consider fun sessions (100%) and useful (94.4%) or adapted to their opportunities (94.4%) while interesting (100%). Also consider that the sessions have improved their physical condition (72.2%) and found it to their practice (88.9%). **Conclusion:** Our research indicates that contributed to a seamless session of fitness, coordination, memory and improvements on the physical, were achieved improvements in perceived health in old adults. This type of intervention invite as a means of socializing and welfare. **Keywords:** Physical Activity; Psychological; Sociological; Satisfaction.

**WEIGHT GAINED SINCE MENOPAUSE AND ADHERENCE TO SUPERVISED TRAINING TRIALS IN OVERWEIGHT POSTMENOPAUSAL WOMEN**

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Adherence to physical activity interventions is instrumental for its success in health prevention. However, the determinants of adherence to exercise trials in postmenopausal women remain poorly understood. Factors such as socioeconomic status, exercise history, and body composition variables have been associated to dropout rates but results remain inconclusive. **Objective:** The purpose of this study was to investigate characteristics differentiating dropouts from completers in sedentary overweight postmenopausal women, potentially explaining why an important proportion did not complete our trial. **Methods:** A 12-month supervised exercise training study was conducted in our laboratory with sedentary, overweight, postmenopausal women (age: 60.1±4.9 yrs; body mass index: 29.2±3.5kg/m²). After the experiment, we compared completers (n = 31) to dropouts (n = 24) regarding several body composition (weight, body mass index, total fat mass, weight gained since menopause), metabolic (fasting glucose level, aerobic capacity, blood pressure, cholesterol level) socioeconomic (age, education level, marital status) and behavioural (physical activity level before and since menopause, tobacco and alcohol consumption) characteristics. Dropouts were defined as subjects not having completed the 12 month-exercise program and the last testing session. **Results:** Among the selected variables, weight gained since menopause was the only factor distinguishing dropouts from completers, as dropouts presented a significantly higher weight gain since menopause (p < 0.05) than their counterparts who completed the study. **Conclusions:** This study suggests that, despite similar body composition, metabolic and socioeconomic profiles, sedentary women who gained more weight since menopause might be less adherent to exercise trials and ultimately, more resistant to lifestyle changes. This outcome brings promising avenues of investigation to help clarify the issues of adherence in sedentary aging women. **Keywords:** Menopause; Adherence; Overweight; Sedentary.
IMPACT OF THE SOCIAL EDUCATOR ACADEMIC SKILLS IN THE ACTIVE AGEING PROMOTION

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The Social Educator Workers aim to empower people and social groups with relevant resources. Its academic preparation should be based on the Active Ageing paradigm (WHO, 2002), in order to contribute actively in health promotion and in the improvement of new opportunities of participation and citizenship through a socio-educational intervention.

Explore the impact of the Academic skills developed in the Social Education Degree of Education School Polytechnical Institute of Viseu on the active ageing promotion. The design was an exploratory study, using a survey with open and close answers applied to the different subjects engaged on the Social Education degree’s Practice. The sample included social education interns (n = 29), practice supervisor (n = 12) and elderly participants (n = 110) (the mode age is on the range of 74-85 years old). The Practice included several activities in institutional and community context. Physical activity was selected as the favourite for most of the participants (90%). The results impact for the developed activities, on target population, show personal, socio-educative and community benefits, being the personal dimension the mainly reported for the practice supervisor (46.2%) and for the education interns (79.7%). The most valorized personal dimension subcategories for both groups were the “interpersonal relationships” and the “increase of occupational dynamics.” The developed activities were very positive evaluated by the elderly group (like very much = 100%). 90% of the inquired sample referred to “be more happy” and 85% “learn new things.” Through the professional practice the Social Education Degree Academic Skills reveals a positive effect in active ageing promotion of the target population. The Practice is evaluated by the three groups (interns, practice supervisor and elderly participants) as important for the personal, socio-education and community development. **Keywords:** Social; Education; Active Ageing; Skills; Promotion.

COLLABORATIVE PATIENT CARE PATHWAY MODEL: AN EVIDENCE BASED PATIENT-CENTERED COORDINATED CARE MODEL FOR GERIATRIC POPULATION

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Model Current trends in healthcare reform in the United States include penalties for high readmission rates that put providers at risk if patients are rehospitalized within 30 days. The goal of recent incentives under healthcare reform is to promote increased attention to chronic disease self-management competencies of patients, alter healthcare delivery systems to have increased responsibility for preventable readmissions and enhance quality care while using resources wisely. Kissito Healthcare has designed a unique collaborative model, the Collaborative Patient Care Pathway (CPCP) Model which aims to deliver quality patient-centered care, greater continuity of care and improved patient outcomes at a reduced cost. The Model primarily focuses on chronic illnesses such as Congestive Heart Failure, Pneumonia, Acute Myocardial Infarction, Diabetes, Orthopedic Conditions, Depression and COPD/Asthma and patient’s self-management skills. The CPCP Model is based on four tenets such as process, quality, cost and outcome with the patient considered as the centre for the tenets and four domains such as Disease Awareness, Adherence Attitudes, Treatment and Medication
Management Competence and Healthcare Communication. Evidence-based best practices are embedded in the care processes. Care is coordinated and integrated across all elements and in a culturally and linguistically appropriate manner. The CPCP model is in its early implementation stage but preliminary results demonstrate reduction in hospital readmissions within 30 days of post-acute-care discharge and successful transition to home among geriatric patients. The components of the Model are constantly being refined to establish best practices, benchmarks, databanks, and setting standards to ensure that national standards are met and exceeded. The goal is to improve patient outcomes at a reduced cost through the CPCP Model that can be widely implemented and ultimately translated into a national standard. 

**Keywords:** Evidence-based; Patient-centered; Care; Cost; Chronic Illnesses.

**INFLUENCE OF HEAT STRESS ON JOGGING PERFORMANCE**

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**Introduction:** It is known that heat stress, common with high temperature and humidity, degrades human activities, and sometimes leads to death, especially for the elderly. Several responses to heat stroke have been adopted, especially in summer. This paper clarifies how changes in temperature and humidity influence the jogging performance of a middle age jogger. 

**Methods:** A healthy male, 56 y, jogged at about 70% strength for 7 km on a flat road in the daytime over an entire year. Temperature (T) (3.8 – 33.5 degree C) and humidity (H) adjacent to the road, heart rate (HR), and average speed were measured. In order to accurately assess the environment, estimated WBGT (Wet Bulb Globe Temperature) was used in conjunction with T and H as measured at the Seikei Meteorological Observatory for comparison. The HR and time were recorded by a wearable sensor (SEIKO PulseGraph). Only the data captured at the same place were used for comparison (N = 61). Average speed (second/km) and average HR were compared in terms of the WBGT zone (5 degree steps from 5.0 to 35.0 degree C; 6 zones in total).

**Results:** The results show that average speed was almost constant if WBGT < 25 degree C. It decreased at the rate of about 5% / 5 degree C over 25 degrees C (p < 0.05). Average HR somewhat decreased over 30 degree C. This comes from the increase of strength by the change of environment resulted in the decrease of the jogging speed. 

**Conclusion:** Our experiment in an actual environment with high temperature and humidity clarified how heat stress influences jogging performance. WBGT might be better for judging the environmental condition than temperature only, especially when the humidity is high. Careful attention is necessary for those exercising if WBGT > 25.0, especially the elderly. 

**Keywords:** Heat Stress; Jogging; Temperature; Humidity.

**SENIOR CITIZENS RISK IN HOUSING PROVIDED BY THE STATE OF CHILE, EVALUATION FOR IMPROVEMENT THROUGH ARCHITECTURE AND DESIGN**

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One of the less attended aspects related to the increasing aging population in Chile deals with the built environment is. By 2050, it is expected that 1 out of 4 inhabitants of our country will be over sixty, which will require an adequate environment minimizing risks situations helping to extend autonomy of this age group. We present an ongoing research related to the identification of risk situations in housing solutions for senior citizens offered
by the government of Chile, in order to develop guidelines which can serve as a base for improvement through architecture and design. Methodologically we have designed an instrument from an ergonomic perspective, which allows us to evaluate risk conditions in the development of basic day life activities in cases studies selected for each typology. Our observation takes in consideration objective, subjective and reference opinions in relation to the problem. From an objective point of view, we consider observation by the professionals participating in this research, architects and Industrial designers; as a subjective input, we consider the opinions of users in space; finally, we consider reference scales through bibliography. Findings consider environmental issues such as security related to the need of protection and definition of territory or healthy environmental conditions required in the interior of units involving heating and ventilation or risk of accidents, which involve inadequate design. **Keywords:** Architecture; Housing; Ergonomic; Risk; Environmental.

**IBUPROFEN IMMEDIATELY FOLLOWING RESISTANCE EXERCISE HAS NO BENEFICIAL EFFECT ON MUSCLE MASS AND STRENGTH IN POSTMENOPAUSAL WOMEN**

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Postmenopausal women typically experience accelerated muscle loss which has a negative effect on strength. One contributing factor for age-related muscle atrophy is inflammation. The use of non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen may attenuate the inflammatory response from resistance exercise leading to accelerated muscle recovery and muscle hypertrophy over time. This study aimed to determine the effects of ibuprofen (400 mg) immediately following resistance exercise (RE) sessions on muscle mass, strength and muscle soreness in postmenopausal women. Participants were randomized to ingest ibuprofen (IBU; n = 15, 57.8±5.1 yrs, 75.9±9.0 kg, 165.9±6.2 cm) or placebo (PLA; n = 13, 56.5±4.4 yrs, 73.0±10.4 kg, 163.1±5.9 cm) immediately following RE (11 whole-body exercises) which was performed 3 days per week, on non-consecutive days, for 9 weeks. Prior to and following training, measures were taken for lean tissue mass (dual energy x-ray absorptiometry), muscle size of the elbow and knee flexors and extensors and ankle dorsiflexors and plantar flexors (ultrasound), and strength (1-repetition maximum leg press and chest press). In addition, participants rated their muscle soreness prior to each training session. Over the 9 weeks of training, there were significant changes (p < 0.05) in lean tissue mass (IBU: -1.1±1.0 kg, PLA: -0.7±1.4 kg), muscle size of the knee extensors (IBU: 0.3±0.6 cm, PLA: 0.2±0.7 cm), ankle dorsiflexors (IBU: 0.5±0.8 cm, PLA: 0.1±0.5 cm), ankle plantar flexors (IBU: 0.3±0.9 cm, PLA: 0.5±0.9 cm), leg press strength (IBU: 20.6±18.0 kg, PLA: 20.0±20.0 kg) and chest press strength (IBU: 5.1±9.5 kg, PLA: 8.1±7.6 kg) with no differences between groups. Muscle soreness did not change in either group over time. Ibuprofen consumed only on resistance-exercise training days has no effect on muscle mass or strength in postmenopausal women. **Keywords:** Ibuprofen; Resistance Training; Menopause; Muscle Mass; Strength.

**CROSS-CULTURAL ADAPTATION OF ASKAS (AGING SEXUAL KNOWLEDGE AND ATTITUDES) SCALE IN BRAZILIAN ELDERLY PEOPLE**

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**Objective:** The proposal of this study was to do a cultural adaptation of ASKAS - Aging Sexual Knowledge and Attitudes Scale to be used in Brazil. **Methods:** The cultural adaptation was accomplished according to the Academy of Orthopaedic Surgeons’ Recommendations for Cultural Adaptation of Health Condition Measures. The sample was composed by 802 individual from public and private educational programs for elderly people. To assess the reliability of the measurement, the Cronbach’s alpha coefficient was computed and confirmatory factorial analysis model (linear structural equation model) was used to evaluate the construct validity. **Results:** The validity of the scale content was obtained through its analysis by the experts committee who elaborated a pre-final version to be used in the pre-test. On the adjustment of the model, were eliminated the factors which presented a low factorial charge in their construct. **Conclusions:** The Brazilian version of ASKAS has a new layout and 28 questions instead 61 of original scale. This scale showed good reliability and internally consistent presenting Alpha’s Cronbach values similar to original version. We expect this research to contribute to future studies about sexuality in the aging process, broadening the knowledge produced in Brazil on that thematic.
Author Index

Aagaard, Per: S234
Aartolahti, Eeva: S220
Abdala, Gina: S60
Abdolrahim, Asadollahi: S154
Abraham, Charles: S245
Adams, Jo: S104
Addamo, Patricia K: S43, S230
Adebowale, Olabisi: S100
Adlam, Tim: S241
Agar, Gill: S55
Agarwal, Shashi: S284, S341, S342
Agyapong-Badu, Sandra: S233
Aita Monego, Estela: S346
Albala, Cecilia: S88
Albuquerque, Eva: S139, S158, S188
Alen, Markku: S170
Alexander, Lyndsay A: S307
Alexander, Neil: S249
Alikhajeh, Yaser: S246
Allan, Kate: S71
Almeida, Patrícia: S168
Alvero Cruz, Jose Ramon: S271
Alves, Janice P: S225
Alves, Susana: S40, S41
Amante, Maria João: S97, S350
Ambler, Phil: S93
Ambrosius, Walter T: S317
Aminian, K: S212
Amorim, Marlene: S95
Andrade, Larissa P: S55, S236
André, Helô: S140, S143, S147
Andreatto, Carla AA: S55, S65, S67, S268
Angilley, Jane: S217
Angleman, Sara: S281
Annegarn, Janneke: S122
Anthony, GB: S294
Anthony, Kevin: S219
Aquino, Jordan: S143
Ara, Ignacio: S283
Araújo, Lia: S97, S350
Araujo, Paulo: S139, S158, S187, S188
Araujo, Timoteo: S329
Aribisala, Benjamin S: S14
Arkela-Kautiainen, Marja: S184
Arnall, David A: S308
Arngrimsson, Sigurbjorn A: S89
Arrieta, Beau: S336
Ash, Sarah: S146
Aspelund, Thor: S89
Aspinall, Peter: S40, S41
Astell, Arlene J: S35, S71, S241
Aubertin-Leheudre, Mylene: S343, S344
Audet, Mélisa: S349
Audifren, Michel: S36
Avendaño, Valentina: S351
Avis, Mark: S199
Äyräväinen, Irma: S320
Aznar, Susana: S283
Backx, KariAnne: S101
Baggett, Sara: S336
Baker, Cherry: S47
Balaban, Eric: S133
Baldus, Heribert: S120
Ball, Madeleine J: S173
Ballinger, Claire: S103, S104, S132
Banerjee, Alakandana: S275
Banks, Nancy: S198
Barber, Sally E: S251
Barbieri, Fabio A: S222
Barbosa, Aline R: S265
Barlow, Cate: S115, S126
Barnard, Elizabeth: S272
Barnard, Robert: S136, S272, S324
Barracough, Elizabeth: S135
Barreto, Maria C: S65
Barreto, Philipe S: S275
Barrett, Hazell: S50
Barron, Evelyn: S12, S286
Barrow, Morag: S309
Barsalani, Razieh: S343, S344
Bartlam, Bernadette: S41, S76
Bastin, Mark E: S12, S14
Batistela, Rosangela A: S222
Batistoni, Samila S: S70
Bauman, Adrian: S136, S182
Bautmans, Ivan: S15, S17
Baxter Jones, Adam: S352
Bayón, Fernando: S34
Bean, JF: S15, S16, S293
Beane, Todd: S10, S48
Beard, Keith: S45
Beattie, Elizabeth: S8,
Beavers, Kristen M: S317
Becker, Clemens: S105, S114
Beckett, William: S146
Beggan, Angela: S57
Belcher, Carolyn: S115, S116
Belda, Juanma: S123
Ben- Moshe, Yosefa: S321
Benedetti, Tânia R B: S348
Beneka, Anastasia: S285
Bennett, David A: S243
Benraiss, Abdelrhani: S36
Bento, Teresa: S28
Bernard, Miriam: S76
Bernhardt, Julie: S290
Bettencourt, Liliana: S276
Bettencourt, Paula: S139, S187, S188
Bevan Jones, Penny: S73
Beyer, Nina: S213, S215
Biddle, Stuart: S249
Bielderman, Annemiek JH: S282, S287
Bielczyńska, Elżbieta: S96
Bierzyńska, Katarzyna: S164
Björksten, Magnus: S48
Bleakley, Chris M: S238
Bloomfield, Yvonne: S96
Blasco-Lafarga, Cristina: S254, S269, S289
Blaum, Caroline: S249
Blaunstein, Eran: S254
Bland, Caroline: S174
Bland, Jonathan: S174
Bland, Lawrence: S20
Bland, David: S20
Blaksley, Bryan: S24
Blecic, Zrinka: S254
Bobak, Martin: S237
Bobeth, Jan: S276
Boersma, Froukje: S287
Bolton, M: S290
Boldy, Duncan: S74, S84
Bondarenko, L: S169
Bors, Stanislaw: S48
Borges, Lucélia J: S265, S348
Borghi, Silvia: S103
Borkoles, Erika: S43, S230
Borner, Fiona: S46
Boss, Christian: S244
Botelho, Maria A: S339
Boucard, Geoffroy: S36
Bouckaert, Jacques: S302
Boudel-Marchasson, Isabelle: S241
Bouquet, Cédric: S36
Bowling, Ann: S115
Boyle, Patricia A: S243
Braccia, G: S228
Brach, Michael: S25, S26
Bravo, June: S149
Brawley, Lawrence, R: S307
Brayne, Carol: S77, S141
Brigidi, Patrizia: S241
Brill, Patricia: S257
Brochu, Martin: S263, S336
Brooke-Wavell, Katherine: S125
Brooks, Charlotte: S103, S104
Brug, Johannes: S324
Brundle, C: S103
Bucci, L: S228
Buccioni, Fabio: S241
Buchan, Aron S: S243
Buchner, David: S5, S19, S20
Buckley, John: S292, S327
Bucchi, Elena: S314
Bulgeron, MV: S210, S213
Bunc, Vaclav: S289
Buranruk, Orawan: S72, S326, S335
Burattini, Marcelo Nascimento: S255, S290
Burdorf, Alex: S228
Burnay, Rita: S339
Burns, Jane: S94
Burton, Elissa: S74, S84
Burton, Nicola: S231
Butler-Browne, G: S228
Buxton, Kim: S325
Cabrera Rodriguez, Gustavo P: S271
Cachioni, Pamela: S110, S111
Cadar, Dorina: S34
Caldwell, Lynn: S135
Callaghan, Paul: S96
Campbell, AJ: S132
Campbell, EL: S228
Campbell, John: S107, S108
Campbell, Valerie: S321
Campos, Antonio: S92, S93
Cancela-Carral, Jose M: S236
Candeia, Filippo: S59
Candow, Darren: S299, S300, S352
Capri, M: S228
Cararo Confortin, Susana: S346
Carlisle, Alison: S248, S269
Carlsson, Gunilla: S224
Carmeli, Eli: S112, S113
Carmichael, A: S279
Carneiro, Elvis A: S271, S344, S345
Carneiro, Filomena: S140, S143, S147
Carvalho, Joana: S95
Carver, Phil: S57
Casa{l{az}, Jos{e} A: S283
Castell, Patricia S: S160, S320
Castell, Sally: S151
Castillo-Rodriguez, Alfonso: S332, S344, S345
Catai, Aparecida M: S177, S235
Cavallo, Viola: S56
Cebri{l{a} I Iranzo, M{l{l}o}z: S90, S308
Cecatto, Mar{f}l{f}ia: S253, S264, S268
Celedonia, Igual Camacho: S308
Cereatti, Lucio: S82
Chalmers, John: S351
Chan, Philip F L: S217
Chang, Chih-Jen: S288
Chang, Shu-Chin: S196
Chang, Shao-Hsi: S65
Chapman, Jane: S198
Charalambous, Yeoryios: S278
Charles, Darryl: S238
Charters, Amy: S106
Chastin, Sebastien FM: S300, S303, S325
Chen, Ching-Huey: S347
Chen, Ching-Yen: S167, S183
Chen, Chung-Yu: S72
Chen, Hui-Chen: S338
Chen, Li-Jung: S52, S53
Chen, Li-Kuang: S192
Chen, Wei-Chen: S144
Chen, Yu-Ling: S249
Cheng, Huey-Shinn: S31, S167, S183
Cheong, Debbie: S158
Cherry, Barbara J: S143
Cheung, Man C: S42
Cheung, Mike KT: S226
Chilibeck, Philip: S299, S352
Chinapaw, MJM: S204
Chiu, Yu-Yun: S80
Chizwiko, I: S169
Chodzko-Zajko, Wojtek: S19, S21, S230
Choquette, Stephane: S343, S344
Chorus, AMJ: S204
Chorus, Astrid: S203, S280, S287
Chou, Shih-Wei: S167, S183
Chow, Hsueh-wen: S65, S144, S231, S338
Christians, Jean: S91, S92
Chudyk, Anna: S314
Ciairano, Silvia: S59, S61, S162
Clarke, A: S294
Clarys, Peter: S313, S314
Claudino, Renato: S167
Clayton, Debbie: S101
Clemson, Lindy: S74, S103, S014, S118, S135
Clifford, Amanda M: S145
Clifford, Angela: S68
Clifton, Karen: S8, S10
Close, Jacqueline CT: S135
Coelho, Flavia GM: S55, S65, S67
Cohen, Rajal: S221
Conde, Monserrat: S139, S158, S187, S188
Connel, Louise: S219
Conte, M: S228
Copeland, Jennifer: S299
Corazza, Danilla I: S55, S65, S67, S230
Cordellat, Ana: S269, S289
Cordes, Mareike: S316
Corley, Janie: S12, S13, S14
Cortis, Cristina: S82
Cosco, Theodore D: S77
Costa, José L R: S65
 Cotter, Nicola: S309, S319
Coulson, Jo C: S319
Coura, Flávio N P: S268
Coventry, Lynne: S242
Cowie, Aynsley: S323, S325
Craig, Louise: S290
Craigie-Sharland, Gemma: S309
Craven, Catherine: S314
Creed, Gisela: S135
Cruz, Sandra: S139
Cruz, Maria H: S42
Cuenca, Jaime: S34, S62
Cullen, Brid: S319
Cummins, Sheilah: S149
Curl, Angela: S40, S41
Curtis, Owen: S272
Curtis, Sue: S272
Cusato, Macarena: S351
Cussons, Karen: S149
Czesak, Joanna: S163
da Conceição, Renata: S265
da Silva, Madalena Gomes, PhD: S225
Dale, Fiona: S271
D’Alessio, Patrizia: S241
d’Amico, EM: S213
Dangour, Alan D: S88
David, Cutler: S45
Davies, Gail: S13
Davis, Mark: S24
Davis, Mark G: S31
Davranche, Karen: S38
Dawalibi, Nathaly WD: S68
Dawson, Lesley: S135
De Angeli, Antonella: S242
De Bourdeaudhuij, Ilse: S302, S313, S314
de Bruin, Eling D: S210, S211, S238, S244
De Donder, Liesbeth: S314
De Greef, Kalijn: S302
de Greef, Mathieu HG: S78, S282, S287
De Koning, Jolanthe: S24
De Lima-Pardini, Andrea C: S221
de Rosario, Helios: S123
de Souto Barreto, Philipe: S310
de Souza, Tiago Rosa: S265
De Witte, Nico: S314
Dean, Catherine: S135
Dean, Sarah G: S245
Deary, Ian: S12, S13, S14
Deeg, DJH: S204
Deforche, Benedicte: S300, S302, S313, S314
del C Valdés Hernández, Maria: S14
del Oro, Carlos Pio: S63
Delbaere, Kim: S120, S121, S122, S186
Delliganesh, Lakshmi: S161
Denpaiboon, Chaweewan: S278
DeRosario, Helios: S120
Desai, Bhargav: S336
Dhillon, Baljean: S217
Dias, Jorge: S278
DiMarco, Nancy: S232
Dinan-Young, Susie: S115, S126, S160
Ding, Xiang: S176
Diniz, Tiego: S316
Dionne, Isabelle J: S263, S343, S344, S349, S336
Dixon, Kimberley: S277
Doble, Susan: S89
Doe, Jacqueline A: S62
Doerksen, Shawna: S299
Dogra, Shilpa: S153, S250, S337
Doistua, Joseba: S62
Dolan, Eimear: S57
Dolbow, David: S208, S209
Dommes, Aurélie: S56
Donath, Lars: S177, S316
Done, Sheila: S158, S261
Donini, Lorenzo Maria: S241
Donnelly, Alan: S38
Douglas, Jenny: S51
Dourado, Grasiele O: S194, S253
Downie, Fiona: S135
Dreyer, Katherine: S232
Drobits, Mario: S120, S124
Dronkers, JJ: S203, S204
Drummond, Avril: S199
Dubery, Jo: S279
Dunsky, Ayelet: S27
Dury, Sarah: S314
Dwolatzky, Tzvi: S27
Dyall, Simon: S248, S269
Dzerovych, Nataliia: S169
Eakin, Elizabeth: S302
Eakin, Tim: S237
Easson, Gillian: S322
Ebner-Priemer, Ulrich: S244
Eccles, Rosalind: S168
Edgren, Johanna: S184
Edwén E, Cecilia: S234
Eggermont, LHP: S293
Eichberg, Sabine: S26, S75, S120, S122, S189
Eicher, Jennifer L: S246
Ejupi, Andreas: S124
Elisa, Järvenpää: S276
Engel, Fabienne: S238
Emeking, Cynthia: S68
Ermolina, Natalia: S66
Eronen, Johanna: S320
Espina, Ervina: S87
Espino, Luis: S283
Espino-Torón, Luis: S43
Esteves, José: S139
Etman, Astrid: S228
Etner, Jennifer: S7,
Evans, Ellen M: S23, S32, S98, S99, S182, S183, S185
Evans, Jonathan J: S144
Ewing, Charles W: S232
Fahey, Avril J: S149
Fairclough, Stuart: S134
Fang, I-Yao: S65, S231
Fargueta, Maria: S348
Faria, Talita: S163
Faronbi, Joel: S100
Faude, Oliver: S177, S316
Fawker, S: S88
Fazeli, Hajar: S246
Feldman, Fabio: S158
Fell, James: S174, S261, S334
Fenton, Grania: S310
Ferguson, Fraser: S262
Fernandes, Ana A: S339
Fernandes, Orlando: S172
Fernandes, Thalita F: S194, S253
Fernandez Vazquez, Rosalia: S271
Fernandez, Viviana: S351
Ferrandez, Anne-Marie: S275
Figueroa, Rafael: S266
Finlayson, Janet: S112, S113
Finn, Peter: S35, S318
Fitzgerald, Eilis: S218
Fitzsimons, Claire: S206, S207
Flannigan, Lynn: S96
Flansbjer, Ulla-Britt: S224
Fleming, Jane: S39, S141
Fleuren, Margot: S287
Flora, Parminder K: S307
Fonseca, Andreia: S190, S327
Fonseca, Susana: S97, S350
Forster, Anne: S245, S251
Forte, Roberta: S82
Fortes, Thalita P: S194, S253, S316
Fox, Kenneth R: S24, S31
Fraga da Silva, Francisco J: S65
Franceschi, Claudio: S228, S241
Francis, Karen L: S237
Frändin, Kirsten: S58, S296, S297, S337
Frank, John: S229
Franzoni, Mariana: S74
Fratiglioni, Laura: S281
Freiberg, Ellen: S15, S112, S114, S296, S297
Freitas, Duarte L: S142, S174
Freitas, Ismael: S193, S194, S253, S316
Fricke, Livia: S177, S316
Frid, Linnea: S240
Frost, Helen: S229
Fu, Stephanie: S133, S141
Fujiwara, Yoshinori: S82
Furst, Sarah: S314
Furtado, Sofia: S159, S172, S277
Gabriel, Swatzell: S276
Gage, Heather: S115, S117
Galbraith, Duncan: S319
Galecki, Andrzej: S249
Galiana, Laura: S90
Galindo Garre, Francesca: S280
Gallo, Luiza H: S55, S67, S253, S264, S268
Galloway, Melanie F: S199
Garber, Carol E: S23, S185
Gardiner, Paul: S300, S302
Garlick, Edie: S333
Garuffi, Marcelo: S55, S236
Gater, David: S208, S209
Gates, Ann: S157
Gawler, Sheena: S115, S158, S160, S245
Geraedts, Hilde: S81
Gerst, Kyle: S35
Ghanbari, Atefe: S347
Gi, Bing-Hong: S31
Giblin, Louisa Brigitte: S86
Gigirey, Luz Maria: S63
Gil, Ana P: S339
Giles-Corti, Billie: S225
Gioftsidou, Asimenia: S285
Girelli, Laura: S162
Gladman, John: S199, S219
Gnylorybov, A: S169
Gobbi, Lilian TB: S222, S253, S264, S268
Gobbi, Sebastião: S67, S222, S236, S253, S264, S268, S230
Godde, Ben: S37
Goldbohm, R Alexandra: S280
Gomes, Igor C: S193
Gomes, Inês: S339
Gomes-Cabello, Alba: S283
Gonçalves, Raquel: S253, S264
González, Dolores: S92, S93
Gonzalez-Gross, Marcela: S283
Goodwin, James: S130
Goodwin, Victoria: S245
Goubert, Liesbet: S313
Goulaart, Rita MMG: S68
Gouveia, Bruna R: S142, S174
Gouveia, Elvio R: S142, S174
Gow, Alan J: S12, S13, S14
Grainge, Matthew: S199
Granat, Malcolm: S243, S323
Grant, Bevan C: S150, S259
Grant, Janis: S84
Grant, Margaret: S206, S208, S301, S301
Gray, Janice: S313
Greig, Carolyn: S213
Gretebeck, Kimberly: S249
Grygorieva, Natalia: S179, S181
Grzebieta, Raphael: S78
Gudlaugsson, Janus: S89
Gudnason, Vilmundur: S89
Guidon, Marie: S330
Guralnik, JM: S293
Gurjão, Andre JD: S253, S264, S268
Gusi, Narcís: S283
Gutierrez, Melchor: S90
Haig, Andrew: S252
Häkkinen, Arja: S220
Hamilton, Laura: S340
Hanawa, Dai: S171
Hancock, Elizabeth: S307
Hanna, Simon: S39, S51
Hanssen, Henner: S316
Hao, Qiukui: S176
Harbour, Robin: S135
Harris, Sarah: S13
Harris, Tamara B: S89
Hartescu, Iuliana: S251
Hartikainen, Sirpa: S220
Hartmann, Herbert: S44
Hastings, Laura: S333
Hatfield, Julie: S78
Hautzinger, Martin: S105, S165
Haw, Sally: S229
Hawkins, Jemma: S101
Hawley, Helen: S127, S128, S159
Haworth, Deborah: S115, S117
Hay, Becky: S333
Hayhoe, Jackie: S150
Hazelton, Christine: S217
Healy, Genevieve: S302
Hector, Rachel E: S248
Heederik, Dick JJ: S315
Heinonen, Ari: S170, S184
Hekmatpou, Davood: S30
Helbostad, Jorunn: S138
Henderson, Clair A: S196, S217
Henwood, Tim: S8, S9, S15, S17
Hernandez-Perera, R: S283
Hetherington, Sharon: S261
Hewitt, Allan: S226
Higgins, Isabel: S172
Hill, Kate: S310
Hill, Keith D: S173
Hillsdon, Melvyn: S31
Hinrichs, Timo: S25, S26, S273
Hobbs, Nicola: S192
Hodge, Jackie: S188
Hoffman, Edye: S39
Hoffmann, Edye: S46
Hogervorst, Eef: S68
Hohmann, Tanja: S38
Holdsworth, Lesley: S262
Holland, Maleah: S318
Hong, Chang-Zern: S262
Honkala, Sini: S320
Hopman-Rock, Marijke: S203, S204, S296
Horak, Fay: S221
Hörder, Helena: S58
Horne, Maria: S110, S127, S129
Horton, Khim: S60, S110, S111
Hoshi, Tanji: S338
House, Allan: S310
Howe, Tracey: S11, S132, S135
Hrasky, Pavel: S289
Hrelia, Patrizia: S241
Hrelia, Silvana: S241
Hrytsenko, H: S169
Hsieh, Pai-Lin: S144
Hsiao, Hung-Chih: S185
Hu, Richard: S252
Hu, Sydney: S70
Huang, Ying-Hsiang: S288
Hui, Elsie: S217
Hulthén, Lena: S234
Hutchinson, Susan: S89
Hwang, Faustina: S241
Iliffe, Steve: S115, S126, S146, S160
Inch, Susan: S333
Inness, Elizabeth L: S175
Irving, Keith: S313
Ishida, Yoshi: S216
Ivko, Kseniya: S98
Jackson, Daniel: S117
Jacob Filho, Wilson: S255, S290
Jafrodi, Shirin: S347
Jaglal, Susan B: S175
Jakeman, Phil: S178
Jakobi, Jennifer: S227
Jambassi Filho, José C: S253, S268
Jancova, Jitka: S237
Janmaimon, Piyapong: S278
Jardim, Maria H: S142
Jardine, Kirsty: S51
Jashina, E: S169
Jefferies, Anita: S340
Jefferis, Barbara, J: S146, S317
Jensen, Jody L: S248
Jimenez, A: S19
Johannsson, Erlingur: S89
Johnson, C Shanthi: S127, S153, S155, S166, S176, S200
Johnson, Derek W: S224
Jones, C Jessie: S19, S49, S143
Jones, D: S294, S295
Jones, Dina L: S246
Jones, Emma: S242
Jones, Gareth: S227
Jones, GM: S19
Jones, R: S305
Jones, RN: S293
Jones, Roger: S22
Jonsson, Palmi V: S89
José Ramón, Alvero C: S329
Joyce, Jennifer: S38
Jung, Songee: S264, S266
Jwo, Hank: S72
Kaartinen, Nico: S120
Kachan, Elisaveta: S98, S255
Kallinen, Mauri: S170, S184
Kanning, Martina: S244
Kantanen, Mari: S279
Kao, Wen-Pin: S201
Kåreholt, Ingemar: S281
Karim, Mohammad M: S210
Karkou, Vicky: S94
Karla, Caillouet: S336
Karlsson, Stig: S220
Karp, Leonid: S274
Kato, Yoshiji: S216
Kaufman, Jean-Marc: S302
Kazem Nejad, Eehsan: S347
Kelly, Andrew: S51
Kelly, Steven: S151
Kendrick, Denise: S115, S126, S146, S199
Kennedy, Carol: S218
Kenny, Rowan: S159
Kerr, Andrew: S144
Kerr, Kirstin: S151
Kerr, Simon: S79
Kerse, Ngaire: S146
Khadra, Hassane: S241
Khalil, Hannele: S320
Khan, Asad: S141
Khaskia, Abid: S27
Khavinson, Vladimir: S255
Kielty, Robert: S304
Kiely, DK: S293
Kilbride, Cherry: S245
Kilgallon, Kate: S169
Killick, John: S50
Kim, Gunhee: S100
Kim, Kyoung Tae: S164, S189
Kim, Laehyun: S100
Kim, Mi-ji: S264, S266
Kim, Theresa: S191, S270
Kimura, Ken: S54
Kimura, Miako: S60
Kinoshita, Larissa N: S70
Kirkham, Catherine: S135
Kirkwood, Tom: S5
Kirwan, John: S247
Kitabayashi, Yukiko: S216
Kitano, Koichi: S35
Kiviranta, Ilkka: S170
Kleiber, Douglas A: S34
Klein, Daniel: S75
Klein, Diana: S105, S165
Kluge, Mary Ann: S173, S259
Knowles, Ann-Marie: S273
Koceja, David: S35
Koeneman, MA: S203, S204
Koenig, Harold: S60
Kofotolis, Nikolaos: S285
Kong, Fanlei: S338
Kooymen, Michiel: S45
Korbys, Heide: S137
Kosmol, Andrzei: S280
Kosterin, S: S169
Kozlowska, Dorota: S163
Kreiner, Karl: S124
Krijnen, Wim P: S287
Krochak, Svyatoslava: S179
Krol, Halina: S164
Kroll, Michael: S122
Krull, Imre: S45
Ku, Po-Wen: S52, S53
Kubinova, Ruzena: S237
Kuepper, Michaela: S105, S165
Kuh, Diana: S34
Kuhtei, O: S169
Kuiper, Rebecca: S203
Kunnen, Saskia: S61
Kuo, Fang-Chuan: S201, S262
Kuroda, Jiro: S82
Kuukkanen, Tiina: S276
Kwon, Gyu H: S100
Laaksonen, Hannele: S66, S95
Lafferty, Linda: S96
Lai, Charles WK: S217
Laing, Nicky: S88
Lal, Sara: S86
Laleh, Fani-Saberi: S154
Lam, Cindy LK: S226
Lancaster, Jeanette: S226
Langhorne, Peter: S217, S290
Lanzarini, C: S228
Lanzi, PL: S211
Lara, Jose: S12, S286
Laskibar, Iker: S76
Lassen, Aske J: S71
Lathangie, Sheila: S63
Laudanna, E: S213
Laventure, Bob: S323
Laxåback, Gerd: S48
Lazcano, Idurre: S62
Lebon, Johann: S263
LeCompte, Michelle: S173
Lee, Ling-Ling: S80, S196
Lee, Yongho: S164, S189
Lees, Carolyn: S134
Legg, John: S196
Lei, Waiin: S70
Leitão, José: S29
Lennon, Lucy: S146, S317
Lera-Navarro, Angela: S43, S88
Leung, Angela YM: S226
Leung, Pet Ming: S158
Leveille, Suzanne: S247, S293
Lewin, Gill: S74, S84
Lexell, Jan: S224
Li, Haiyan: S180
Li, Hsiao-Juan: S167, S183
Li, Philip KT: S217
Li, Yi-Shan: S53
Liang, Jersey: S167, S183
Liao, Yi-Chen: S231
Liddle, Jenny: S76
Lima, Josivaldo: S64
Lin, Chu-Hsu: S185
Lin, Ellen Chinger: S72
Lin, Linda L: S144, S338
Lin, Pay-shin: S31
Lin, Sang-I: S347
Lin, Wan-Ju: S288
Lindelöf, Nina: S220
Lipsonnen, Anssi: S48
Lirani-Silva, Ellen: S222
Little, Anne: S61
Little, Glenn: S85, S86
Littlechild, Dianne: S324
Liubicich, Monica Emma: S162
Livingstone, Katrina: S217
Lochs, Herbert: S241
Logan, Pip: S219
Lönnroos, Eija: S220
Lopes, Marize A: S348
Lopez de la Fuente, Manrique: S39
Lopez, Lorna: S13
Lord, Brian L: S260
Lord, Stephen R: S108, S121, S135, S136, S186
Low Choy, Nancy: S133
Lowrie, Sheena: S46
Lu, Feng-Hwa: S288
Luciano, Michelle: S13
Ludmila, Oliveira: S316
Lundman, Berit: S220
Luo, Li: S176
Luzardo-Henriquez, Laura: S43
Lyle, Roseann: S195, S265
Lyysra, Tiina-Mari: S320
Macek, Pawel: S164
Machado, Maria: S140, S143, S147
Mackinnon, Margaret: S138
Maclean, Lin: S35
MacLean, Linda: S241
Macniven, Rona: S136, S182
MacRae, Priscilla G: S237
Madariaga, Aurora: S62
Magistro, Daniele: S162
Magnusson, Peter S: S234
Mahecha Matsudo, Sandra M: S329
Maia, José A: S142, S174
Mainetti, R: S211
Makula, Waldemar: S73
Malladi, Srinivasa S: S161, S180
Malliou, Paraskevi: S285
Mamon, Zul: S106
Mancini, Rafael: S266
Manson, Barbara: S97
Manson, James: S153, S191, S270, S337
Manuel, Jiménez L: S329
Markis, Natalie: S29
Marques, Ana Isabel: S95
Marques, António: S339
Marquez, Jodie: S172
Marston, Hannah R: S122
Martin, DJ: S294, S295
Martin, Antonia: S328
Martin, Denis: S247
Martin, DG: S293
Martin, Ruth: S218
Martínez, Gustavo: S92, S93
Martinez-Navarro, Ignacio: S254, S269
Martins, Maria M: S142
Martins, Raul A: S190, S327
Mason, Phil: S33
Masoumi, Nasrin: S347
Massé, F: S212
Masud, Tahir: S115, S124, S126, S219
Mata, Esmeralda: S283
Mathers, John: S12, S286
Mathews, Charles E: S300
Matsudo, Sandra: S64, S266
Matsu, Tomoki: S264
Matta, Klaus: S148
Matthews, C: S300
Mattson, Christopher: S318
Mauro, Roncon: S329
Mavromoustakos, Savva: S285
Mazumdar, Indu: S335
Mc Ewan Gulliver, Barbara: S45
McCarthy, Ian: S256
McCullagh, Ruth: S218
McDonald, Claire: S79
McDonald, Suzanne: S192
McDonough, Suzanne: S238, S247
McEvoy, L: S103
McGee, Hannah: S330
McHugh, Gillian: S80
McIntosh, Andrew S: S78
McKay, Heather: S314
McKerrow, Jayne: S321
McLean, Fiona: S97
McLeod, Katherine M: S127, S176, S200
McLeod, Tracy: S340
McMillan, Freya: S206, S208
McMurdo, Marion ET: S32
McNamee, P: S294
McNeill, Michael: S238
McPhee, J: S228
McShea, Gillian: S152
McWhinnie, Anne: S96
Mead, Gillian: S205
Meagher, Margaret: S81
Mechling, Heinz: S26, S189
Mello, Marco T: S329
Melo, Ruth C: S70, S177, S235
Meneghini, Vandrize: S265
Mercer, Jenny: S101
Merom, Dafna: S136, S182
Meurer, Johanna: S123
Michalopoulou, Maria: S285
Milat, Andrew: S136, S182
Milbourne, Paul: S101
Miller, Sophie: S312
Milner, Colin: S47, S102
Minou, Masoumeh: S134
Mishra, Gita: S34
Mitchell, Michelle: S106
Mitchell, Sarah: S323
Mittnitski, Arnold: S286
Mohanty, Alakananda: S350
Monda, Maureen: S256
Monger, Claire: S182
Moniz-Pereira, Vera: S140, S143, S147
Monteón, Cristina: S348
Montague, Jan: S160
Monteagudo, María Jesús: S34
Montiel-Gámez, Pedro: S332
Moore, Tisha: S249
Morales, Blanca: S76
Morat, Tobias: S26, S189
Morgan, Amy L: S19, S22
Morgan, Kevin: S251
Morgan, Michelle: S159
Morris, Jacqui: S205
Morris, Richard: S160
Morrow, Linda: S321
Moschny, Anna: S273
Mota, Jorge: S95
Mota, Maria P: S28
Muhaidat, Jennifer: S144
Muilenburg, Ted: S10, S48, S131
Mulasso, Anna: S59, S162
Muñoz Maniega, Susana: S14
Munro, Frank: S217
Murer, Kurt: S238
Murillo Corzo, Sergio: S197
Murray, Anne: S135
Mutrie, Nanette: S206
Nakayama, Naoko: S338
Nantakomol, Duangdao: S331
Narici, Marco: S228
Narita, Makoto: S268
Nasar, Jack: S313
Nascimento, Carla MC: S236
Nathan, Andrea: S225
Neil, Fiona: S132
Nelson, Jean: S138
Nemoto, Miyuki: S264, S266
Netz, Yael: S25, S27
Neves, Rui: S168, S276
Neville, Christine: S8, S9
Nevin, Mark: S93
Newton, Julia: S79
Newton, Rita: S326
Nicklas, Barbara J: S317
Nieder, Frank: S26
Nishigaki, Toshio: S82
Nitz, Jennifer: S133, S141
Niven, Ailsa: S88
Njuakom Nchii, Francis: S69
Nobaya, Ahmad: S154
Normandin, Eve: S336
Nunes, Marcelo ES: S58, S74
Nurhidayah, Siti: S161
Nutbeam, Don: S104
Nyman, Samuel R: S107
O’Brien, Anne E: S32, S98, S99, S182, S183
O’Connor, Kieran: S218
Ogonowska-Sodownik, Anna: S280
Oguchi, Etsuko: S351
Oguchi, Kimio: S171, S351
Ohuchi, Masaki: S171
Okada, Soichi: S268
Okamoto, Teiji: S82
Oksanen, Jukka: S95
Okubo, Yoshiro: S264, S266
Olafsdottir, Anna S: S89
Olalde, Idoia: S39
Olivaes, Pedro R: S283
Oliveira, Patricia G: S333

Oliveira-Tavares, António: S95
Oliver, Sue: S94
Onambele-Pearson, Gladys: S213, S214
O’Neill, Mark: S45
Oosterom-Calo, Rony: S324
Opuchlik, Anna: S164
O’Reilly, Niamh: S218
Ormerod, Marcus: S311, S326
O’Rourke, Sandra: S135
Orpin, Peter: S261
Orr, Heather: S217
Orr, Margaret: S138
Ostan, Rita: S241
Osuka, Yosuke: S264, S266
Owen, Neville: S292, S300, S302
Pablos, Ana: S348
Pablos, Carlos: S254, S348
Pafis, George: S285
Pakkala, Inka: S170
Palagnyk, Victor: S255
Palasuwon, Attakorn: S331
Papadimitriou, Katerina: S285
Papegaaij, Selma: S221
Paraschiv-Ionescu, A: S210, S212
Parnell, Dan: S304, S305, S306
Paterson, Don: S299
Patrick, Julie Hicks: S240
Payette, Hélène: S336
Peacock, Leslie: S226
Pearce, Mark: S79
Pearl, Mirilee: S115, S116, S156
Pearson, Natalie: S249
Peasey, Anne: S237
Pecora, Federico: S61
Pedrero-Chamizzo, Raquel: S283
Pedroso, Renata V: S55, S65, S67
Penhall, Robert: S136, S324
Perales, Jaime: S77
Percy, Diane: S311
Pereira, Jessica R: S236
Pereira, Marcelo P: S222
Perenboom, Rom: S280
Perez, Manuel: S240
Perreault, Karine: S343, S344
Pesce, Caterina: S82
Pfeiffer, Klaus: S105, S165
Phillips, Lorraine: S29
Phoenix, Cassandra: S259, S274
Picardo, Joaquim: S316
Picavet, H Susan J: S234, S235, S315
Pierre, Saubade: S241
Pikhart, Hynek: S34, S237
Pikkarainen, Aila: S279
Pils, Katharina: S15, S18
Pinto, Alessandro: S241
Pirovano, M: S211
Pittaway, Jane: S173
Pizzi, Marcela: S351
Platen, Petra: S273
Platte, Kirsten: S273
Pohl, Petra: S47
Pollock, Alex: S217
Polman, Remco: S43, S230
Poltawski, Leon: S245
Portegijs, Erja: S170, S184
Porter, Michelle M: S218
Porter-Armstrong, Alison: S238
Poulos, Christopher J: S85
Poulos, Roslyn G: S78
Povorozniuk, Vasyl: S179
Povoroznyuk, Vladyslav: S169, S179, S181
Power, Valerie: S145
Prado, Alexandre KG: S55, S253, S264, S268
Prendergast, Fiona: S327
Prestmo, Anders: S138
Preuß, Peter: S189
Promsaka NS, Sarunwit: S278
Pryen, Florence: S241
Pugh, Stephen R: S148
Pustisek, Matevž: S76, S240
Pye, Victoria: S136, S182
Quintas, João: S278
Quitério, Robison J: S235
Rabaglietti, Emanuela: S59
Rafael, Figueroa: S264
Rafferty, Danny: S126
Rafferty, Lynsey: S321
Raimundo, Armando: S172
Rajan, Pavithra: S218
Ramalho, Fátima: S143, S147
Ramaswamy, Bhanu: S221, S223
Ramel, Lisa: S173
Ramsay, Elisabeth M: S135
Rantakokko, Merja: S184, S320
Rantanen, Taina: S170, S184, S320
Rasali, Drona: S127, S176, S200
Raso, Vagner: S64, S266, S329
Ray, Mo: S41
Razieh, Zandieh: S340
Read, Sanna: S170
Recalov, D: S169
Redhead, Ruth: S106
Regelin, Petra: S44
Regterschot, G Ruben H: S180
Reid, Darren: S334
Reitermayer, Joerg: S239
Rejeski, W Jack: S317
Rekagorri Barrenetxea, Andoni: S197
Rennie, Michael J: S213, S214
Renske, van Abbema: S78
Richards, Marcus: S34
Richards, Rosie: S256
Richardson, D: S305, S306
Riebe, Deborah: S23, S24, S185
Riesco, Eleonor: S343, S344
Rikli, Roberta: S49, S257
Rimmer, James: S224
Rissel, Chris: S78
Ritchie, Daniel: S195, S265
Rivera, Karen: S351
Roberts, Helen: S222
Robertson, Iain K: S173
Robertson, Kate: S103, S104
Robertson, Lynette B: S29
Rochester, Lynn: S118, S119, S132
Rockwood, Kenneth: S286
Rockwood, Michael RH: S286
Roden, Amy: S159
Rodrigues Barbosa, Aline: S345, S346
Rodriguez-Marroyo, Jose A: S283
Rogers, Michael E: S19, S20, S216, S268
Rogers, Nicole L: S216, S268
Roggero, Antonella: S59
Rokka, Stella: S285
Roland, Kaitlyn: S227
Roldan, Ainoa: S269
Romo-Perez, Vicente: S191, S232
Roppolo, Mattia: S61, S162
Rosa, Maria João: S95
Rosália, Fernández V: S329
Rose, DJ: S107, S109, S142, S143, S160
Roth, Ralf: S177
Rowe, Fiona: S217
Rowe, David A: S23, S24, S185, S226
Salbach, Nancy M: S175
Saliba-Serre, Bérengère: S275
Salpakoski, Anu: S184
Saltvedt, Ingvild: S138
Salvini, Tânia F: S177, S235
Salvioli, S: S228
Samant, Chetna: S335
Santana, Marcos: S329
Santarem, Jose Maria: S255, S290
Santos, Jair LF: S333
Santos, Lionai L: S193
Santos, Marcio J: S167
Santos, Suely: S58, S74
Santos, Vanessa R: S193
Santos-Galduróz, Ruth F: S55, S65, S67
Santos-Rocha, Rita: S143, S147
Saravanakumar, Padmapriya: S172
Saunders, David: S205
Scharf, Thomas: S76
Scheicher, Marcos: S163
Scherder, Erik JA: S30
Schöning, Sima: S123
Schott, Nadja: S38, S137
Schout, Gert H: S282
Schouten, Leo: S280
Schuler, Petra: S336
Schwab, Petra: S103, S105
Schwingel, Andiara: S230
Seino, Satoshi: S264, S266
Seitsamo, Jorma: S77
Selva Raj, Isaac: S254
Semsaltianou, Eleni: S200
Seoane, Santiago: S63
Sergeant, Elizabeth V: S151
Serrano-Sanchez, Jose A: S43
Sewell, Martin: S51
Seynnes, OR: S228
Shah, Raj C: S243
Shah, Suhayb: S191, S270, S337
Shahani, Uma: S217
Shamsi, Mohsen: S30
Shankar, Aparna: S24
Shaw, Rebecca: S206, S207
Shea, Beverley: S135
Sheehy, Rebecca: S93
Sherrington, Catherine: S108, S135, S136
Shield, Anthony: S254
Shimada, Keizo: S216
Shing, Cecilia: S261
Shmerling, RH: S293
Shouji, Toshio: S171
She, Beverley: S135
Sheehy, Rebecca: S93
Sherrington, Catherine: S108, S135, S136
Shield, Anthony: S254
Shimada, Keizo: S216
Shing, Cecilia: S261
Shmerling, RH: S293
Shouji, Toshio: S171
Shpillevaya, N: S169
Shum, Wai C: S226
Shyu, Yea-Ing L: S167, S183
Sibbritt, David: S172
Sibley, Kathryn M: S175
Siemonsma, Petra: S287
Siggeirsdottir, Kristin: S89
Sigmund, Ebby: S193
Sihvonen, Sanna: S170
Silva Duarte, Maria de Fátima: S345
Silva, Camila B: S194, S253, S316
Silva, Celso: S159
Silva, Eduardo P: S194, S253, S316
Sim, Julius: S41, S76
Simons, Dorien: S313
Simpson, Alan: S57
Simpson, Liz: S340
Sims-Gould, Joanie: S314
Sindra Virtuoso, Jr, Jair: S191, S232
Singleton, Diane: S134
Sipe, Cody: S11, S19, S131, S195, S265
Sipili, Sarianna: S170, S184
Siwon, Anna: S164
Skalska, Marie: S289
Skelton, Dawn A: S11, S102, S103, S115, S126, S132, S138, S144, S160, S325
Skemp, Lisa: S127, S130
Skillen, Nicola: S63
Skoog, Ingmar: S58
Sletvold, Olav: S138
Slinde, Frode: S234
Smit, Henriette A: S235, S315
Smith, April-Louise: S256
Smith, Beth: S221
Smith, BH: S294
Smith, Brett: S274
Smith, Nicola: S41, S150
Smith, Stuart T: S121, S186, S202
Smith, Tom: S241
Smyth, PJ: S38
Sniehotta, Falko: S192
Snook, Ali: S173
Soares, Pedro: S95
Soitu, Daniela-Tatiana: S197
Song, Kyohyun: S100
Souza, Nuno MF: S190, S327
Souza, Marina GTX: S74
Souza, Paula ML: S255, S290
Spirduso, Waneen W: S7, S237
Stack, Emma: S222
Stager, Joel: S35, S318
Stahl, Sarah: S240
Stamatakis, E: S300, S301
Stanford, P: S103
Starr, John: S13, S14
Stathi, Afrodit: S24, S31
Stathokostas, Liza: S250, S299
Staudinger, Ursula: S37
Steele, Jenessa: S240
Stein, Martin: S123
Stella, Florindo: S55, S236
Stephan, Blossom: S77
Stevens, Martin: S81
Stevens, Zoe: S115, S116, S126
Steverink, Nardi BJM: S287
Stevinson, Clare, D: S251
Stewart, Sabita: S126
Stock, Jennifer: S68
Stock, Lauren: S141
Stokes, Maria: S233, S277
Stranzinger, Karin: S105, S165
Stratton, Gareth: S134
Straus, Sharon E: S175
Strike, Siobhan: S248, S269
Stuart, Laura: S83, S91, S92
Studenski, Stephanie: S202
Stut, Wim: S324
Suanklay, Kornika: S331
Suksam, Daroonwan: S331
Sulkakoski, Sonja: S66
Sulkava, Raimo: S220
Sun, Wen-Jung: S52, S53
Suominen, Harri: S25
Sutherland, Rona: S226
Svantesson, Ulla: S234
Swan, James H: S232
Synenkii, O: S169
Szczерbinska, Katarzyna: S163
Szmigin, Isabelle: S279
Sztynda, Tamara: S86
Tak, Erwin: S203, S296, S297, S298
Takahashi, Anielle CM: S235
Takehima, Nobuo: S216, S268
Tamim, Hala: S153, S191, S270, S337
Tan, Rita KS: S180
Tanaka, Kiyoji: S264, S266
Taraldsen, Kristin: S138
Taylor, Rod S: S245
te Velde, Saskia: S324
Teixeira, Luis A: S221
Teixeira-Arroyo, Claudia: S222
Tenenbaum, Gershon: S336
Tenn, Trish: S51, S323
Teodorov, Elizabeth: S67
Terada, Shuhei: S171
Testa, Daniela: S177
Theou, Olga: S227, S258, S286
Thingstad, Pernille: S138
Thirlaway, Katie: S101
Thomas, Janet: S118
Thomas, Ken: S252
Thompson, Janice L: S24, S31
Thompson, Martin: S245
Thomson, Julie: S57
Thorlund B, Jonas: S234
Thornton, Matt: S256
Thow, Morag K: S126, S319, S323
Tibbs, Bronwyn: S321
Tiedemann, Anne: S107, S108
Tiikkainen, Pirjo: S276
Timmons, Suzanne: S218
Timon, Claire: S241
Todd, C: S103
Toji, Hideki: S82
Tomás, José M: S90, S308
Tomkins-Lane, Christy C: S252
Toomey, Clodagh: S178
Topaz, Rona: S52
Torres-Luque, Antonio J: S332
Tournier, Isabelle: S56
Townley, Bex: S118, S119, S258
Traill, Mima: S327
Trengove, Nathan JT: S139
Tribess, Sheilla: S191, S232
Trisolino, G: S228
Trost, Stewart: S146
Trottier, Lise: S306, S336
Trubina, S: S169
Trushkova, Nina: S66, S165
Tsai, Yu-Tien: S31
Tse, Michael: S226
Tseng, Ming-Yueh: S167, S183
Tseng, Tsai-Jou: S31
Tsiouri, Christiana: S278
Tu, Kou-Cheng: S231
Tudor-Locke, Catrine: S302
Turrell, Gavin: S312
Uauy, Ricardo: S88
Uchida, Hayato: S82
Ungerer-Roehrich, Ulrike: S239
Uy, Gilda L: S154, S282
Vaarama, Marja: S320
Vaca, Raúl: S76, S240
Valencia-Peris, Alexandra: S269
Valentine, Rudy J: S32, S99
Valentini, Luzia: S241
Van Cauwenberg, Jelle: S313, S314
Van den Brandt, Piet: S280
van der Bent, Edith: S45
Van der Cammen, Tischa: S228
van der Ploeg, Hidde: S136, S182
Van Der Riet, Pamela: S172
van der Schans, Cees P: S78, S282, S287
Van Holle, Veerle: S313, S314
Van Lenthe, Frank: S228
van Meeteren, Nico: S204, S287, S296, S298
van Oostrom, Sandra H: S234, S235, S315
Van Tilburg, TG: S204
van Uffelen, Jannique: S231
van Wijk, Frederike: S205
Vandermeulen, Suzanne: S149
Vasconcellos, Andressa N: S177
Vass, Catherine: S199
Vázquez, M Covadonga: S63
Veloso, Antonio: S140, S143, S147
Venigalla, Sumanth K: S161
Vereijken, Beatrix: S138
Verheijden, MW: S204
Verma, Ashok: S127, S176, S200
Verschuren, WM Monique: S234, S235, S315
Verté, Dominique: S314
Verych, V: S169
Victor, Christina R: S107
Vieira, Natália D: S177
Viezel, Juliana: S194, S253, S316
Villa, Jose G: S283
Villares-Torquemada, Eva M: S332
Visser, Marjolein: S204, S213, S215, S234, S235
Vitório, Rodrigo: S222
Vivienne, McNiven: S59
Voelcker-Rehage, Claudia: S37, S148
Vogler, Constanze: S135
Vogt, Emelie: S352
Volkers, Karin M: S30
von Bonsdorff, Mikaela B: S77
von Bonsdorff, Monika E: S77
Vroeling, Hilde: S280
Walker, Elaine: S51
Walker, Emma: S51
Wallace, Ricky: S134
Wallace, Vivian: S340
Wang, Huixin: S281
Wang, Shuo: S338
Wannamethee, S Goya: S146, S317
Ward Thompson, Catharine: S29, S40, S41
Ward, Christie L: S32, S99
Wardlaw, Joanna M: S14
Warner, Grace: S89
Warner, Martin: S233
Warren, Alison: S80
Waterman, H: S103
Wealleans, Lynne: S149
Weisgarber, Krissy: S352
Welmer, Anna-Karin: S281
Wendel-Vos, GC Wanda: S235
Wertman, Annette: S156
Whincup, Peter, H: S146, S317
White, Kirsty: S45
White, Ciara: S277
White, Martin: S12, S192, S286
Wiechting, Rainer: S120, S123
Wilkinson, Christopher: S242
Williams, Andrew D: S173
Williams, Liz: S241
Williamson, Toby: S84
Wilson, Carolyn: S62, S152
Wilson, G: S293, S295
Wilson, Lee-Ann: S312
Winberg, Cecilia: S224
Winters, Meghan: S314
Witter, Yvonne: S45
Wolfe, Laura: S232
Wollesen, Bettina: S148
Wood, Lisa: S225
Woodard, Jennifer: S276
Woodrum, Bill: S10, S48, S131
Woods, Catherine B: S328
Wouters, Inge M: S315
Wu, Chi-Chuan: S167, S183
Wu, Elyse: S72
Wu, Guan-lin: S231
Wu, Jin-Shang: S288
Wu, Olivia: S290
Wuest, Seline: S211
Wulf, Volker: S120
Wyatt-Williams, Jeannie: S259
Yabushita, Noriko: S264, S266
Yamagata, Michiaki: S171
Yan, Jin H: S36
Yang, Ching-Tzu: S167, S183
Yang, Ming: S176
Yang, Suwen: S338
Yang, Yi-Ching: S288, S347
Yano, Mari: S82
Yarrow, Lesley: S138
Yassuda, Mônica S: S70
Yasunaga, Akitomo: S54
Yau, Sui Yu: S53, S267, S330
Yildiyoğlu, Ulcay: S240
Yu, Lei: S243
Yue, Jirong: S176
Zahner, Lukas: S177, S316
Zak, Marek: S163, S164
Zaman, Starr: S310
Zamani, Majid: S30
Zamora, Gerardo: S240
Zenko, B: S212
Zhang, Wei: S180
Zhao, Cuili: S180
Zijlstra, Agnes: S81
Zijlstra, Wiebren: S81, S180, S243
Zucchetti, Giulia: S59
Zuin, Affonso: S29