Marathon Training

How to optimize your training program to reach your potential

Pete Pfitzinger

Presented in conjunction with the Illinois Marathon
What we will cover

- Principles for designing your marathon training
- Monitoring training intensity using heart rate
- Benefits of 7 types of runs
- Periodization = changing emphasis
- Tapering your training
Principles for Marathon Training

- Understanding the requirements of the marathon allows you to make your training specific and effective
- Improvement comes from adaptations to training
- Adaptations occur from making the training stressful and specific to the requirements of the marathon
- Evaluate the benefits of more hard training versus the increased risk of injury, illness and over-training

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Designing your training program

- Switch to marathon-specific training about 12-18 weeks before your marathon
- 12-18 weeks provides enough time to improve without being so prolonged that you lose focus
- We will discuss 7 types of runs and how to select when and how often to do each
- Rushing or trying to improve in several ways at the same time almost never works!
7 Types of Runs

Benefits, intensity, sample workouts for:

- Long Runs and ‘Medium Long’ Runs
- Tempo runs
- Marathon Pace Runs
- VO₂ Max Intervals
- Speed Training
- General Aerobic Runs
- Recovery (runs & cross-training)
Monitoring intensity using heart rate

- Heart rate = a measure of how hard you are working
- Useful to stay within target range for specific workouts (e.g. tempo runs, recovery runs)
- Heart rate monitor – wherever you are, download later
- Can use % of your maximum Heart Rate or more complex Heart Rate “reserve”
- Do not be a slave to Heart Rate-it is just a guide
### Monitoring intensity using heart rate

<table>
<thead>
<tr>
<th>Activity</th>
<th>Max Heart Rate (%)</th>
<th>Heart Rate Reserve (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VO$_2$max (5K pace)</td>
<td>93–98</td>
<td>91–96</td>
</tr>
<tr>
<td>Tempo runs</td>
<td>82–91</td>
<td>77–88</td>
</tr>
<tr>
<td>Marathon pace</td>
<td>79-88</td>
<td>73-84</td>
</tr>
<tr>
<td>Long Runs</td>
<td>74–84</td>
<td>65-78</td>
</tr>
<tr>
<td>General aerobic</td>
<td>70-81</td>
<td>61-75</td>
</tr>
<tr>
<td>Recovery</td>
<td>&lt;76</td>
<td>&lt;70</td>
</tr>
</tbody>
</table>

Less fit = lower end of range, elite = higher end

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Monitoring intensity using heart rate

- Examples:
  - Maximum HR = 185 bpm
  - Tempo Runs @ 82-88% = 152-163 bpm
  - Recovery runs @ less than 76% = keep below 138 bpm
Monitoring intensity using heart rate

- Maximum heart rate varies so formulas are not accurate
- Find your own max HR = 3 x 600 meters hard uphill
- Heart rate drift = HR increases during a workout and more so on a hot day
Long runs & Medium long runs

- Long runs (16+ miles)
- Medium long runs (11-15 miles) reinforce long runs and build confidence
- Lead to many adaptations in your muscles which improve endurance; including increased glycogen storage, fat utilization and capillarization
- Psychological benefits of “handling” the distance
Long runs & Medium long runs

- For most marathoners, build long runs to 21-22 miles (34-35 km)
- Most long runs should be 10-20% slower than goal marathon race pace
- Start comfortably and build into it
- Sometimes just get in the distance (e.g. day after a tune-up race)
- *Occasionally* run at marathon race pace
## Long run paces

<table>
<thead>
<tr>
<th>Marathon pace</th>
<th>20% slower</th>
<th>10% slower</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:00 mile</td>
<td>6:00</td>
<td>5:30</td>
</tr>
<tr>
<td>5:30 mile</td>
<td>6:36</td>
<td>6:03</td>
</tr>
<tr>
<td>6:00 mile</td>
<td>7:12</td>
<td>6:36</td>
</tr>
<tr>
<td>6:30 mile</td>
<td>7:48</td>
<td>7:09</td>
</tr>
<tr>
<td><strong>7:00 mile</strong></td>
<td><strong>8:24 mile</strong></td>
<td><strong>7:42 mile</strong></td>
</tr>
<tr>
<td>7:30 mile</td>
<td>9:00</td>
<td>8:15</td>
</tr>
<tr>
<td>8:00 mile</td>
<td>9:36</td>
<td>8:48</td>
</tr>
</tbody>
</table>

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Increasing mileage sensibly

- Increase gradually to avoid injury: (e.g. max 10% per week) Jack Daniels = increase max 1 mile for each run per week
- Avoid speedwork while upping your mileage
- Slightly reduce training intensity when increasing mileage
- Do some training off road/sidewalks
Tempo runs

- Improve lactate threshold: ability to produce energy at a fast rate aerobically without high levels of lactate in muscles
- Pace you could race for about 1 hour (15K race pace)
- Excellent predictor of marathon race pace (sub 4 hour marathoners race 15-30 seconds per mile slower than lactate threshold pace)
Tempo runs

- Maintain lactate threshold pace for 20-40 minutes
- Also Cruise intervals or LT intervals (break up tempo run into several segments with short recovery)
- Approx 82-91% max HR or 77-88% HRreserve

Sample workouts:

- 20 min warm-up, 25 min tempo run, 15 min cooldown
- 20 min warm-up, 15 min LT interval, (3 min jog), 10 min LT interval, 15 min cooldown
Marathon Pace runs

- Most specific type of training
- On road simulating marathon course
- Approx 79-88% Max HR or 73-84% HRreserve
- Practice race pace and maintaining technique
- Start comfortably and build up to race pace
- Include sparingly (2-3 times over 12 weeks)
- Sample workout:
  - 18 miles with 14 miles at marathon race pace
VO$_2$ Max Training

- Ability: 1) to transport large amounts of oxygen to muscles and 2) of your muscles to use oxygen
- Left ventricle of heart gets bigger and stronger so can pump more blood
- Stimulate improvement by training at intensity of 95-100% of current VO$_2$ max (3K-5K race pace)
- Marathon focus = less intense, about 5K race pace
VO₂ Max Training

- Workout target = accumulate time at 5K race pace using intervals of 800 to 1600m
- Typically 6-8Km (3 ½ to 5 miles) of effort
- Recovery approx 50-90% of effort time (70% max HR)
- Sample workouts: (20 min warm-up, 15 min cooldown)
  - 2 x 1600m, 2 x 1200m, 2 x 1000m. Total = 7,600m
  - 5 x 1200m. Total = 6K
  - Recovery from 1200m @ 4.30 = jog 2.15 to 4 minutes
Increasing speed

- Short repetitions (80-120m) run fast but relaxed
- Also 10-15 second uphill reps to build power
- Generous recovery
- Increased stride length and stride rate
- Prevents the marathon shuffle
- May improve running economy (ability to use oxygen economically) by eliminating unnecessary movement
Increasing speed

Sample workouts: (20 min warm-up, 15 min cooldown)

- 2 sets of 4 laps of stride straights & jog bends (jog 5 min btw sets)
- 2 sets of 4 x 15 sec uphill (jog 5 min btw sets)
- 6 x 15 sec uphill, jog 5 min, 4 laps of stride straights & jog bends
General aerobic runs

- Increase overall training volume and endurance
- Approx 15-25% slower than marathon pace
- Approx 70-81% Max HR or 61-75% HRreserve
- Less important training
- Can be replaced by cross-training if injury prone or bad weather

Photo: Stacey Cramp
Recovery

- Recovery is vital to improvement
- If you recover more quickly, you adapt and progress more quickly
- Easy running and cross-training can improve recovery
- Lifestyle factors (sleep, diet, hydration, stress) affect recovery
- Kenyan secret = no distractions aids recovery
- Recovery training is counterproductive if done too hard
Recovery

- Slowest runs of the week!
- Keep recovery runs less than 76% of max HR or <70% HRreserve
- Sample workouts:
  - 30-40 min easy run
  - 45 min “spin” on windtrainer
- Recovery weeks (decrease mileage and intensity) about every 4 weeks

Photo: Stacey Cramp

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Periodization

- Change the emphasis of training as your marathon approaches to target specific areas for improvement.
- It takes at least 3 weeks to clearly improve any of the physiological variables. After about 6 weeks there is a tendency towards diminishing returns.
- Typically change the emphasis of training every 3-6 weeks.
- Each 3-6 week unit = a training block or mesocycle.
- Variety is stimulating!

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Periodization

- Each 3-6 week training block has a primary emphasis and a secondary emphasis
- In each 2 weeks do about 3 primary emphasis workouts and 2 secondary emphasis workouts

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Periodization

During the first training block, the emphasis is almost always on increasing long runs and overall mileage

<table>
<thead>
<tr>
<th>Block</th>
<th>Primary emphasis</th>
<th>Second emphasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Long runs &amp; mileage</td>
<td>Tempo runs</td>
</tr>
<tr>
<td>2</td>
<td>Tempo runs</td>
<td>Long runs</td>
</tr>
<tr>
<td>3</td>
<td>Race preparation</td>
<td>Long runs</td>
</tr>
<tr>
<td>4</td>
<td>Taper &amp; marathon</td>
<td>Long runs</td>
</tr>
</tbody>
</table>

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Q: How to avoid cramping up at 35 km?

- Long runs as preparation-handle 21-22 miles in training
- A couple of long marathon pace runs = simulation
- Taper training so fully recovered at start and no injuries
- Carbo-load and be well-hydrated at start of race
- Avoid dehydration by drinking during race (carbs and electrolytes)
- Avoid hot and humid races
- Maintain a realistic pace you can handle
Tapering your training

- During the final training block, taper your training so you are optimally recovered for the marathon
- Effective tapering maintains peak fitness while re-building your energy reserves
- Tapering corrects the wear and tear of training
- Begin taper 3 weeks before your marathon

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Effective Tapering

- Maintain training intensity
- Reduce mileage
- Make recovery days very easy or take days off
- Optimize lifestyle recovery strategies (sleep, diet, hydration, stress)
- Continue stretching, massage, etc
How much to reduce mileage

Third week pre-marathon: 20 to 25%
Second week pre-marathon: 40%
Marathon week (6 days pre-race): 60%

Photo: Stacey Cramp
Wrap-up

- Principles for designing your marathon training
- Monitoring training intensity using heart rate
- Benefits of 7 types of runs
- Periodizing your training
- Tapering your training leading up to race day
- Final point: Listen to your body and use your experience
Questions?

Photo: Stacey Cramp
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Running for Women
Presented by Jason Karp, PhD

Wednesday, February 20 2013
2:00 PM Eastern Standard Time

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