How to Train for a Marathon
Beth A. Taylor, PhD; Paul D. Thompson, MD

Although the title of this Cardiology Patient Page emphasizes “training” for a marathon, the ultimate goal of training for a marathon is not to start but to finish the 26.2 mile footrace. Consequently, the necessary steps to complete a marathon require a focus on 3 goals: injury avoidance, physical training, and psychological preparation (Figure 1). Because most popular marathon training programs focus on physical preparation, this article provides description of the general principles necessary to optimize the likelihood of crossing the finish line on race day.

Unfortunately, to train for a marathon is to expose oneself to a high risk of injury. For example, the yearly incidence rate for running injuries varies between 37 and 56%, and may be as high as 90% in individuals training for a marathon.1 About 50% to 75% of injuries are attributable to overuse, and 20% to 70% of individuals who experience an initial running-related injury encounter a recurrence.2 Paradoxically, though, higher weekly training volume predicts successful completion of a marathon, suggesting that failure to finish a marathon is often a direct result of poor preparation.3 Therefore, the first goal of marathon preparation is to avoid injury, while still training adequately. To avoid injury, runners need to be fully recovered from any and all injury or illness before running a marathon. Injury risk is also minimized by a training program that gradually increases distance and intensity. Because injury rates increase beyond a weekly mileage of 40 miles/week, moderate mileage also reduces injury risk. In addition, periods of hard marathon training increase an individual’s susceptibility to upper respiratory tract infections.4 Although there are no proven supplements that consistently enhance immune function in marathoners, strategies such as a well-balanced diet with ample fruits and vegetables and sufficient sleep will support the immune system in marathoners.

The actual training program used by each runner will differ according to goals, lifestyle, physical capabilities, and previous experience. Regardless, marathon performance is improved in recreational runners who incorporate tempo and interval runs, more miles per week, and more days of running.5 Therefore, a successful training program will incorporate runs of various speeds and distances and also ideally be undertaken only after a runner has achieved a strong foundation of fitness and mileage. Beginning runners are encouraged to work with a coach, join a running group, or consult an online program to best choose the training schedule that matches individual goals and abilities.

Finally, there are psychological challenges to running a marathon. For example, many runners question the safety of running a marathon, because adverse events are widely publicized. Although there are some limited studies suggesting that runners may exhibit unexpectedly high coronary atherosclerosis,6 recent data indicate that marathon running is extremely safe. For example, of almost 11 million runners who participated in marathons and half-marathons over a 10-year period, only 59 experienced cardiac arrest, making the rate 0.54/100,000 participants.7 Therefore, runners undertaking the training for a marathon should not be discouraged by the cardiac risks. However, runners with a history of previous cardiac events or established cardiac risk factors should consult their physician before initiating training, particularly if they have been previously sedentary.8 Race day preparation is also an important consideration, because for most runners, the distance of the marathon will be the longest they have ever run. There are several...
cognitive strategies used by runners to successfully navigate a marathon. These include association (focusing on the body during the task), disassociation (detaching focus from the physical exertion), and positive self-talk. Evidence is equivocal as to which of these strategies is most effective, so runners may want to practice these techniques (Figure 2) to experiment with effectiveness.

In conclusion, although there are widely publicized training programs for runners attempting a marathon, a successful marathon training program involves 3 components. The emphasis on avoiding injury, finding the right balance between training and overtraining, and addressing the psychological risks of long-distance racing will optimize a runner’s chances of experiencing the indescribable joy of crossing the finish line after 26.2 miles.

Sources of Funding
Dr Taylor receives salary support through funding from the Alzheimer’s Association (New Investigator Research Grant) and National Institutes of Health grant R01HL098085.

Disclosures
Dr Thompson reports receiving research grants from the National Institutes of Health, GlaxoSmithKline, Amhera, Braun, Genomas, Roche, Aventis, Novartis, and Furiex; serving as a consultant for Astra Zenica, Furiex, Regeneron, Merck, Roche, Genomas, Abbott, Lupin, Runners World, Genzyme, Sanofi, Pfizer, and GlaxoSmithKline; receiving speaker honoraria from Merck, Pfizer, Abbott, Astra Zenica, GlaxoSmithKline, and Kowa; owning stock in General Electric, JA Wiley Publishing, J & K, Sanofi-Aventis and Abbott; and serving as a medical legal consultant on cardiac complications of exercise, statin myopathy, tobacco, ezetimibe, and nonsteroids. Dr Taylor reports serving as a consultant on a pharmacovigilance board for Amgen Pharmaceuticals.

References
How to Train for a Marathon
Beth A. Taylor and Paul D. Thompson

_Circulation_. 2014;130:e98-e99
doi: 10.1161/CIRCULATIONAHA.114.008708
_Circulation_ is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2014 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/130/11/e98

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in _Circulation_ can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to _Circulation_ is online at:
http://circ.ahajournals.org/subscriptions/