Building the perfect marathon performance Part 1

Day to day, I serve clients in my facility who aspire to improve performance. It's what I do. Ironically, when I sat down to write this article I found it unusually challenging not for lack of information, quite the contrary. There are just so many variables that can affect performance, so I really needed to try and narrow my thoughts to the focal issues most runners face. Here's what I've decided to do; I am going to break it down to the things that present the greatest hurdles to overall performance.

Number One
Strength to weight ratio – This is a hot topic right now, as some of the top researchers are coming to realize how important muscular development is, in any sport, at any distance or intensity. Consider that running at any pace or distance represents time under tension. If you are not at an optimal body weight, supported by adequate strength you will fatigue too early. As you fatigue your stride length and cadence begins to degrade. The more fatigue you experience, the body intuitively places more stress on the working joints to placate the failing muscles. As this fatigue becomes more critical, the central nervous system will eventually shut down the movement in an attempt to control further damage; the outcome is... you're walking instead of running.
Excess weight will also cause any work to come at a greater cost of energy and the likelihood is that most of the running you'll do will be above your anaerobic threshold, which will put you exclusively into your sugar stores. If you have paid attention to earlier writings from me, you know that we are very limited in how much of this energy we can actually store *(generally less than two hours worth)*, not nearly enough to finish 26.2 miles.
One of the most effective things you can do to reduce your marathon time is to drop body fat while preserving muscle. This is accomplished through careful meal planning. Making sure that you are getting the appropriate ratio of carbs, fats and proteins without consuming more calories than you need. It is also very important to time your meals in such a way that you effectively replace the energy stores that you deplete as a result of your training.

Number Two
Sufficient mileage – If you do the research that I've done, you'll find that great performances are generally associated with successfully banking *(injury free)* mileage. This is a very complicated juggling act. Many of you reading this have a variety of pressing responsibilities that take precedence over your recreational running, and you know that a long run requires recovery, which typically precludes you from putting in a long run before work. The only chance most of us get to relax and put in a nice long base run is on Saturday or Sunday. This leaves us with a pretty weak accumulation of mileage during the work week. The problem here is that in order to survive a good long effort on the weekend you need to build the muscular tenacity and tolerance to fatigue during the week. If you run too few miles during the work week your body will be taxed heavily on the weekend and you set yourself up for injury.

This table shows how high the actual potential for injury becomes as mileage increases.
Research on incident of injury relative to weekly mileage

Miles/week	No. of participants	Injury incidence (% per year)
10-19	191	29.3
20-29	183	36.1
30-39	93	40.8
40-49	25	52.0
>50	31	71.0

I am going to go on record and suggest that it's not so much the total mileage that's the culprit in these cases, as much as it is the approach to obtaining these high mileage weeks. In the lesser mileage columns, I would suggest that the pace and intensity is too high which is common with novice runners. Intuitively, as runners become more seasoned, they are able to survive higher mileage weeks and then you'll see more incident of injury resulting from poor muscular maintenance pre and post work outs.

To avoid this potentially high risk to injury, take care of your body, stretch and roll *(using a foam roller)*. Plan your running schedule to include longer "quality" aerobic base runs during the mid week. If your time is limited, try doing pre and post work sessions, maybe an hour before work and an hour before dinner after work or whatever allotted time is appropriate for your level of fitness and experience.

This table suggests, relative to your running pace at varying distances what kind of mileage you should be able to accomplish and vice versa.

Weekly Mileage Recommended based on Finish Times at Varied Distances

Distance	Advanced	Experienced	Average	Novice
10 miles	43 min - 1:04 h:m	1:04 - 1:25 h:m	1:25 - 1:46 h:m	1:46 - 2:08 h:m
1/2 Marathon	57 min - 1:25 h:m	1:25 - 1:53 h:m	1:53 - 2:22 h:m	2:22 - 2:50 h:m
Marathon	2 - 3 hrs	3 - 4 hrs	4 - 5 hrs	5 - 6 hrs
Suggested Weekly Training	8+ hrs (60+ mpw)	6 - 8 hrs (40-60 mpw)	4.5 - 6 hrs (25-40 mpw)	2.5 - 4.5 hrs (15-25 mpw)

Abbreviations: sec = seconds; min = minutes; m:s = minutes and seconds; h:m = hours and minutes; ; hrs = hours; mpw = miles per week

Number Three

Economy of movement- Economy is really a broad reaching consideration in the overall training scheme. Here is some logic that is difficult to refute: In order to run faster, you must train fast. Speed work provides a left handed compliment to running economy in that as you learn to settle into a faster pace, the metabolic cost of running at these faster paces goes down. The best way to teach the body to tolerate speed is through carefully planned intervals.

Interval training sessions can and should vary relative to where you are in your global scheme. In the early months of training, you want to use short duration high intensity intervals to improve your motor skills. The intensity helps to train the fast twitch muscle fibers and improve the hearts pumping and storage capacity. Motor skill development is a function of training the central nervous system to recruit more muscle fibers and educating the firing sequence of the muscles responsible for the given task *(running).*

You should be careful not to spend too much of your time training at these high intensities early on for two good reasons; one, the risk of injury is high until your muscles have a chance to gradually adapt to the stress, and two, too much high intensity training will play havoc on all the aerobic base development that you are doing.

Another important consideration is your running form or "gait". There is a tremendous amount of buzz lately regarding, "the right or wrong way to run". For so many years we have just taken for granted the way in which we hit the ground is being "just the way we run" and that there is no right or wrong way to do it. I can tell you with confidence that if you are a heavy heel striker and or an over-strider, these traits can lead to injury as your mileage begins to mount up. This being said, there are a host of other faults in running that can subject you to injury if gone unchecked. Aside from the potential for injury, poor running form will also slow you down and increase the overall cost of work. Again, placing you over your anaerobic threshold and striping you of your

meager sugar stores. A good running coach should be able to identify some of these flaws and advise you on the proper course of action, but there is much to be said for having a video gait evaluation to screen the problems and set about making corrections that will lead to a more economical running style and ultimately shaving several minutes from your finish time.
While I am on the subject of economy, if you are not already using a heart rate monitor during training and racing, what's your hold up? There is no better way to evaluate your progress, control training intensity and pace, and keep track of energy expense. The best investment any endurance athlete can make is in a good running computer. *(The advancements in monitors today have gone beyond just monitoring heart rate, so now they are referred to as computers!)* Arrange for a VO2 max and anaerobic threshold assessment so that you can precisely program your computer with your unique metabolic profile. We've been doing this for our clients for over 12 years now and I can tell you from experience that it does make a significant difference.

So there you have it, what I consider three of the most pertinent issues that surround marathon performance. In the next article, I hope to build on this topic with some other valuable points with enough time left for you to put them into play before your next race.