

Science-Based Performance Improvement Training

Practical Considerations

August 1, 2006

This installment provides a transition between the fundamentals and the specific, recommended training routines. It discusses the fundamental principles in practical terms and, in general, how to apply them.

Following are several important topics. Later in the series, I'll provide recommendations for specific weekly workouts. These topics provide the basis and purpose for the workouts.

Compared to traditional training regiments, modern research shows that our training should include more very high intensity training, to best improve $VVO_2\text{max}$, and greater distances at a slower pace and less frequently, to improve fatigue resistance. The next two topics examine these two concepts in more detail.

Running Economy and $VVO_2\text{max}$

It should be obvious from the "Fundamentals" paper that improving our running economy should be your top priority. Recall, from "Fundamentals," the statement "It can only be done with high intensity workouts, intervals and hills, etc." This applies to improving both $VO_2\text{max}$ and bio-mechanics. The recommended routines will include interval training, hill workouts, sprints and 30/30 or 60/60 drills.

The research is unequivocal, $VVO_2\text{max}$ can only be materially improved by exceeding 90% of $VVO_2\text{max}$ during the workouts. This is "hard work." In practice, you can judge 90%+ based on how you feel.

For your **interval training**, I highly recommend participating in a formal interval training program, if you can find one in your area. They generally have a good mix of the routines you should be doing. If your schedule prohibits you from participating in a formal ITP, it is imperative that you schedule one day per week for your own interval training routines. They should be on Tuesday, Wednesday or Thursday. AND, you should do them with a group; you'll work harder and better. For routines, just use the ones listed every week on the ITP web page.

Hill workouts: I will recommend they be somewhat different from what you may be accustomed to [i.e., probably: repeatedly pounding hard up and jogging slowly down the same hill]. Remember the discussion about our "Central Governor" [CG]? The old way teaches our CG how to deal with hills exactly like the one we've trained on. We want the hill workouts to improve our running economy and our fatigue resistance when races include hills. Unfortunately, most races don't have hills just like the one we trained on. We will use hilly areas with a variety of lengths and grades. You should pound up the hill, as before; but, I recommend that you run down very fast, concentrating on rapid turnover and control. Good racers are good downhill runners. Fast downhill running must be done with great care the first few times as the eccentric contractions of the quadriceps muscles must absorb higher than normal forces.

Take a minute and read a copy of Owen Anderson's "Sore No More" [RRNquad.pdf](#) Though he doesn't use term CG, it is obvious that is what you are training. You'll see why I recommend running downhill fast, so the CG can learn to deal with the extra forces.

Sprints and 30/30 or 60/60 drills: There is increasing evidence that sprints and 30/30 and 60/60 drills can provide rapid and outstanding running economy improvement. Though I only mentioned it briefly in “Fundamentals,” lactate utilization is a key factor in fatigue resistance and possibly improved $\dot{V}O_2\text{max}$. Incidentally, the “**lactate**” in our bodies is sodium lactate, not lactic acid. Modern research has conclusively shown that lactate is a key component of the “glycolysis” cycle. Our muscles produce and utilize lactate. In fact, there is growing proof that it may be one of the most important energy fuels we have. Its role is not fully understood, except that it can be measured and as we improve our ability to utilize lactate, our $\dot{V}O_2\text{max}$ improves. Or, it may be that as our $\dot{V}O_2\text{max}$ improves, our ability to utilize lactate improves. Whichever, it doesn’t matter for our purposes. Research has shown that if we do drills which flood our blood with lactate, and then allow our systems to recover, there is a dramatic improvement of $\dot{V}O_2\text{max}$. So, there have been a lot of controlled experiments recently to find ways to do just that, force an overflow of lactate which teaches our system how to utilize it.

In recent years, a lot of research has been directed to finding the optimal distribution of intensity, duration, and repetition times for workouts. For example should intervals be run at 400m, 800m, or 1200m? Though the research to date is not conclusive, it does appear that endurance runners should be doing a lot more very short, very high intensity workouts, sprints and short intervals.

Sprints: In Owen Anderson’s “Running Research News,” issue “Volume 22, issue 3,” he reports on a study conducted by researchers from Imperial College in London, Deakin University, the University of New South Wales, and Queensland University. The study investigated the effect of adding sprint training to runner’s normal training program. The results were extraordinary, all subjects had a significant improvement in $\dot{V}O_2\text{max}$ and top running speed. I suggest, getting a copy of the issue for the full details. In his usual fashion, Owen provides an excellent explanation of the physiology involved and the article covers additional supportive research by other researchers. To get the full benefits of adding sprints to your program, I suggest paying for the article, it is worth it. Here is a brief synopsis. Don’t forget that a great warm-up precedes all sprinting.

An early sprint workout might be constructed as follows (The 5 minutes recovery can be walking or setting):

- (1) 4 X 40 meters, 1/5 work/rest ratio, five minutes of recovery at end of set,
- (2) 4 X 50 meters, 1/5 work/rest ratio, five minutes of recovery,
- (3) 4 X 60 meters, 1/5 work/rest ratio, five minutes of recovery, and
- (4) 2 X 80 meters, 1/5 work/rest ratio, cool-down

Toward the end of the sprint-training phase of your program, your sprinting might look something like this (after warm-up):

- (1) 8 X 160 meters, 1/3 work/rest ratio, five minutes of recovery before the next set,
- (2) 6 X 140 meters, 1/3 work/rest ratio, five minutes of recovery,
- (3) 6 X 120 meters, 1/3 work/rest ratio, five minutes of recovery, and
- (4) 6 X 100 meters, 1/3 work/rest ratio, cool down.

30/30 or 60/60 drills is another method. Here, you run all-out for 30 seconds, then stop or walk slowly for 30 seconds. The 60/60 version is simple 60 seconds per. Do about 20 reps.

Installment “ $\dot{V}O_2\text{max}$ ” will cover an easy method to measure your $\dot{V}O_2\text{max}$. This will enable you to objectively measure your progress.

Fatigue Resistance

Recall, there are two principal components we need to address, toughening our muscles and ligaments, and training our Central Governor [CG].

Toughening your running gear is pretty well taken care of with the intervals, hills and stuff.

Training your CG is simple, spend time and distance running longer than you intend to race. A drill I highly recommend and will promote often is to include some fast work near the end of all runs 5 miles or more. During a 5 mile run, at about mile 4, put in a fast ½ mile. Then jog the last ½ mile to cool down and recover. Same thing for your 10 milers, except run mile 8 fast and jog the last mile. This exercise teaches your CG that you can safely run fast, even when you are tired. This simple sounding drill pays dividends in races. When all around you are fading, your CG will let you to pick up the pace and sprint in at top speed.

I'm going to address the distances recommended for your long runs in more detail later in the series. In general, I recommend that seasoned racers not run any distance between 12 miles and 25 miles, except as an integral part of a long-distance week. If you think back over the Fundamentals discussion about the CG, it should be obvious. If you are training for the marathon, then you need to teach your CG to run at least 26 miles. If you are training for a 10 miler, then 12 miles, or so, is sufficient. Spending time routinely running 14 or 18 miles, etc., serves no purpose and unnecessarily fatigues you; thus, impacting your ability to do quality interval or hill works later in the week.

For marathon training, I recommend at least two 30 milers, run at about **1 minute per mile slower** than your intended marathon pace. Every 5 miles, run ½ mile at your 10-mile race pace; and, at mile 27, run 2 miles at your 10-mile race pace. You may think this is impossible; but, I can assure you that it will be easier than you can imagine. Always jog the last mile. This mile is the beginning of your recovery; **don't skip it.**

Long runs will be considerably slower than you are accustomed to. Obviously, the objective is to train your CG to **let** you run farther and longer. You should run ALL your long runs slow, relative to your 10K time, slower by 1 minute per mile for 10 milers and slower by 1 ½ to 2 minutes per mile for 20 miles, etc. Running slow is necessary to prevent unnecessary fatigue, which requires excessive recovery time, and getting into Overtraining State.

Maintain an even pace for the duration of your long runs, except for the fast segments as noted in the previous paragraphs.

It is imperative that you **do not** walk, even up hills, when doing your long runs. Keep in mind that the object is to teach your CG to **let** you keep running when you are tired. If you walk up hills and the last few miles during your training runs, then you will have trained your CG to help you do the same thing when you race.

The key to training your CG is to maintain strict discipline during the run, even pace, no walking, and fast segments when you demand them. In essence, you are training the dumbest part of your brain, the autonomic system.

If you run a long-run 1 minute slower than the target-race distance [e.g., 10 miles for a 10K, 30 miles for a marathon, etc.] pace and you find it to be particularly difficult, then something is wrong. Consider that your target pace was too fast or that you are in a slight overtrained state.

Research shows our systems remember fatigue resistance for months; but, the loss in running economy can be measured in just a week or two. It seems obvious to me, though I've not read an explanation, that fatigue resistance is a brain memory function and $VVO_2\text{max}$ is primarily a physical function. Despite the reason, I recommend that your training consist of about 3 weeks of $VVO_2\text{max}$ enhancement and about 1 week of fatigue resistance work.

Overtraining Syndrome Prevention

I highly recommend that everyone take off 1 day per week. You can do an alternative exercise; bike, swim, walks, play tennis, drink beer, whatever.

The recommended training will have an abundance of recovery days, slow jog days following interval workouts, etc.

You should include many days of running just for the pure joy, no particular workout, time, speed or distance. Remember, running is just a hobby for most of us, so enjoy it.

In general your rule should be: No two adjacent days the same, no two adjacent weeks the same and no two adjacent months the same.

To repeat, Overtraining Syndrome is insidious. In the early stage, you may feel good; yet, your $VVO_2\text{max}$ may suffer. In lieu of having a professional coach to keep a close eye, you must be alert to the symptoms and take action accordingly. Warning signs are: general sluggishness, heavy legs, lack of enthusiasm about doing your workout, a drop off in $VVO_2\text{max}$ or race performance, etc. If you are a very serious racer, I highly recommend reading Noakes' chapter 7 on the subject.

From personal experience, I found myself walking, for no apparent reason, in the middle of routine easy, maintenance runs. I felt fine, wasn't particularly tired, just found myself walking. In retrospect, I suspect my CG was taking over.

Racing As a Training Drill

Racing, in my opinion, is a terrific training workout. It combines $VVO_2\text{max}$ and CG training. Everyone I've ever discussed track verses race speed has said they can run faster in a race than they can on the track doing workouts. Many of the old time top-racers in this area just race on weekends and essentially rest and jog a bit during the week. If you think about it a bit, it makes sense, hard work for $VVO_2\text{max}$ and CG training most every week and lots of rest in between.

5K and 10K races are terrific training workouts.

Racing to Improve Racing Performance

Just like everything else, in order to race well, you must practice. All good racers race often.

Here is some advice. Recall I stated first thing for this series "Principal beneficiaries of this program are seasoned runners who wish to improve their performance, perhaps to qualify for Boston, break 40 or 45 minutes for a 10K, etc." This implies you have a goal. You will find it highly beneficial to incorporate

several races as training tools for your target race. For example, every year I run a couple of 10Ks in preparation for the Cherry Blossom 10miler. I recommend several 5K, 10K and 10 miles when preparing for a marathon.

Rest for Improvement

Recall, the fundamental principle for performance enhancement is: “Hard training breaks you down and makes you weaker. It is rest that makes you stronger. Physiologic improvement in sports only occurs during the rest period following hard training. During recovery periods these systems build to greater levels to compensate for the stress that you have applied. The result is that you are now at a higher level of performance.”

Therefore, it is mandatory to rest following all hard workouts and races if your goal is to improve your race times.

Here are some guidelines for “rest.” Controlled studies have shown conclusively that following a marathon the best recovery is to take off a week. Recovery results were compared with jogging, light speed work, walking, and other light alternative sports, etc. The best was total rest; but, slow walking and light alternative sports were almost as effective. For other distances, just proportion your time, e.g., a 10K, 2 or 3 days. Full recovery takes about 1 day per mile of racing. Professionals, use this as a guideline when deciding to schedule the next race.

Marathon Training, is it special?

You may have observed that I’ve not mentioned anything special about training for marathons. The reason is simple, basically the training is the same as for 5Ks, 10Ks, and 10 milers, etc. The only difference is that you need a couple of very slow runs exceeding 26 miles to train your CG.

Your time will be primarily determined by your VVO_2 max. Not convinced? In the section “WAVA%,” we’ll discuss why your WAVA% is related to your VVO_2 max. The WAVA% is a value for your age, gender, and race distance relative to a mathematically derived ultimate performance [100%] for the same parameters. The WAVA% tables were empirically determined and are very accurate. Assume your WAVA% is 58% for a 10K, then it will also be close to 58% for all other distances. There is no special factor for marathons, they are just another point on the curve.

Incidentally, you can extend this discussion to include ultra-marathons. The only significance between regular and ultras is that ultras require extra special attention to glucose replacement. Basically, everyone who runs a sub 4 hour marathon has ample glucose stores to finish. Taint so, when running more than 5 or 6 hours.

Your Marathon WAVA% as it Relates to Shorter Race Distances

If all your shorter distance WAVA%’s are approximately the same, then your running economy is probably good. Clearly the problem is either fatigue resistance **and/or** overtraining **and/or** poor race tactics. Let’s examine each one of these factors.

If your training regiment was based on the obsolete dogma of limiting your longest training runs to 20miles and then expecting to “gut it out” the last 10K, it is obvious your CG and all your running systems expect to quit shortly after mile 20. The clearest indicator for this factor is to note whether you had to walk intermittently between mile 20+ and the finish; and yet, you were not unduly fatigued. After the race, you may have observed that you weren’t as beat as you had expected.

Probably the best indicator of being slightly overtrained is to note whether the feeling of fatigue came on slowly starting well before mile 20, i.e., the so called ‘heavy legs’ feeling. Following the race, you probably felt “wiped out”.

Tactically, “Going out to fast” [i.e., running the first 3d, or so, too fast] is undoubtedly the worst error many of us make. It is so easy to do. We are excited; we should be running at marathon pace, yet it is so slow and easy; there is even an old dogma that says we that “should put some time in the bank, because we’re going to slow down later on anyhow.” Virtually all national and world road racing records are done with negative splits [i.e., running the first half slower than the second.]. “Planning and Running Races” covers this topic in detail.

Older Runners, Using their WAVA% to Examine Performance Loss

Runners older than about 58 naturally expect their race performance to decline. The question is how “by how much”? Using the WAVA% Calculator, it shows that given a WAVA% of 60% for a man, aged 60 and running a 10km race, he can expect a time of: 55:38. At 61, his time would be 56:08. That’s a loss of 30 seconds in just one year. By the time he’s 70, his time will be 1:01:08; a loss of 6:30. And in just one more year, at 71, he’ll lose almost another minute.

One important question arises among older runners, “How can I tell if my performance loss is due to age, training and/or Overtraining Syndrome? The answer is simple; use the [WAVA% Calculator](#) for a couple of current year races and the same, or similar, races last year. If your WAVA% value has dropped [remember, it should be constant regardless of age], examine your training methods and the possibility that you have a slight case of Overtraining Syndrome. Incidentally, there is some evidence that the potential for Overtraining Syndrome increases with age. No one knows whether it’s simply a function of age or due to many years of training.

How Many Miles per Week?

The researchers are finding better performance results when runners reduce their average weekly mileage, within reason. Unfortunately, I can’t find much written about the explanation for this finding. So, I’ll provide my own conjecture and recommendations.

I think the explanation involves a trade-off between quality workouts to improve VVO₂max and fatigue resistance workouts, coupled with a mild case of Overtraining Syndrome. World class marathoners still train about 120 to 140 miles per week. However, they confine these enormous-mileage weeks to just a relatively short span when they are peaking [see Sharpening... below] for an important race. And, they do not neglect their running economy [VVO₂max] workouts during this time. Incidentally, they workout 2 or 3 times per day to moderate the stress.

Notice that I underlined “average” above. I think that is the key to understanding how many miles per week are necessary to race at your best. The answer for most of us amateurs is to average somewhere between 40 and 60, depending on your dedication, schedule [it takes a lot of time] and age.

However, to improve and maintain fatigue resistance, I recommend a long-distance week, perhaps 1½ times your average weeks, to be run once every 3 or 4 weeks. I’ll have some recommendations in the series later. Recall, our systems remember fatigue resistance very well, so it’s not necessary to do 90 mile weeks all the time.

Here is a copy of Owen Anderson's e-newsletter on the subject that you will find interesting.

[RRNmarathon_mileage.pdf](#)

Increasing Mileage Rapidly

We all have repeatedly heard that our mileage should be increased slowly to prevent injuries. The dogma is typically 10% maximum per week. Ever wonder how folks can run ultras of 50 or 100 miles when their longest training run was perhaps 26 miles and not incur a serious injury? What the 10% rule leaves out is the fact that it assumes the runners try to maintain the same speed as the distance increases. And, they increment the distance every week with no rest. My local running club's summer marathon training program is a prime example. I've observed that many of our members run the scheduled long runs at tempo pace, near their 10 mile race pace, week after week. Then they add in interval training and some races. This combination is certain to negatively impact performance and can lead to overtraining syndrome.

Generally, you can increase an individual run distance or a weekly distance as much as you like, provided you slow down considerably. Use the formula in "Cardinal Rules." as a guide.

Injuries

This is an impossible subject to cover succinctly and comprehensively. To start with, there is very little research to report on and the anecdotal material available is overwhelming. It is obvious why there is very little research available. Conducting controlled experiments requires dozens of volunteers to submit to the inducement of various specific injuries. Then, the subject's response to experimental treatments would need to be closely monitored. Not very many folks would volunteer for such research. The only other research methodology is to derive empirical data from practitioners who treat injuries. This is fruitless because virtually all of them use the dogma they learned in school and in subsequent education, virtually none of it is based on any research. A simple example is RICE, [short for: rest-ice-compression-elevation] There is NO evidence that RICE promotes healing. In fact, there is some evidence that ice retards healing; yes, it may reduce swelling; but, it retards healing. Which do you want? If you think about it with a little common logic, rest is the only component that makes any sense. Our bodies have been learning to deal effectively with injuries for a million years, swelling must have a useful purpose. Why should we work at reducing it with compression, ice and elevation? I don't know the answer and neither do the practitioners.

Now let's turn to what is known. For convenience, we can categorize injuries into:

External Traumas: This one is easy and I won't bother discussing it, sprains are a typical result [Falls, twisting an ankle, etc.]

Internal Traumas: Generally confined to elite sprinters, etc., These folks are so powerful they can rip muscles and ligaments when racing or training hard, very rare for us ordinary folks.

Chronic Overuse Injuries: Typically large muscles, e.g., hams. These injuries are common with recreational runners, especially long-time racers. It one of the few injuries that is pretty well understood. The breakthrough came when they did muscle biopsies on people without any injury symptoms and discovered enormous cellular damage. Generally, the basic cause for this type of cell damage is due to an imbalance between the affected muscles and the opposing ones, e.g., hams verses quads. Most runner's quads tend to become strong relative to their hams. When this happens, the quads can force the hams into eccentric contraction, which overwhelms the ham cells. After time, the damaged cells develop

scar tissue which then turns into “knots.” There seems to be a trip point where the damage becomes so large that it cascades into a debilitating injury. Fortunately, this injury can be cured in days with deep massage to break up the knots. Unfortunately, it requires several sessions per day and few message therapists are setup to work this way. If you are plagued with chronic sore hams read Dr. Noakes’ “Lore of Running” or his book ‘Running Injuries.’ Rest will not cure this injury; as soon as you start seriously running again, the soreness will return. Prevention and cure requires ham string resistance training to correct the imbalance. I'm prone to this injury and resistance training is the only thing that has ever worked for me.

Delayed Onset Injuries: This is an overuse injury. Generally occurs about 48 hours after the triggering event, e.g., a race or hard workout. Like the Chronic Overuse Injuries, this is generally thought to be an incipient type injury where there is extensive unnoticed cell damage that cascades into a full blown injury. Rest, with slow active recovery is the cure. Prevention is to pay attention to the need for adequate rest following workouts and races.

Spasms and Cramps: Typically calf cramps. This one has been study extensively without any significant results. Theories included: low potassium, low electrolytes [salt], heat, cold, muscles imbalance, shoes, and about a dozen other possibilities. The researchers concluded it had to none of the above, or all of them. Resistance training to strengthen the calves seems to be the best prevention and cure.

I'll venture a personal opinion on Delayed Onset and Spasm injuries. I think they may be due to essentially the same causation and that proper CG and resistance training is the best prevention tool.

In “Program Fundamental,” I mentioned that Owen Anderson’s May 20th e-newsletter described some research that shows we can train our brain to prevent injuries caused by overreaching "eccentric" contractions of the quadriceps muscles. Owen calls it a brain function whereas Noakes calls it the CG, it's obviously the same thing. [RRNquad.pdf](#)

Specific Local Injuries:

Iliotibial Band Friction Syndrome [ITBS]: The iliotibial band is a tendon that runs from the hip across the outside of the knee and attaches to the upper shin bone. This injury is more common among women runners for two reasons, one their hips are wider which cases their hips and upper body to swing more when they run and their core muscles [these muscles connect the hips and rib structure] are weaker. You've probably noticed women tend to rotate their upper body more than men. This injury is caused by excessive friction of the tendon rubbing the knee bone. It is very difficult to cure. I recommend that all runners, and especially women, do the “plank” to strengthen their core muscles. Incidentally, strengthening the core muscles has additional benefits, it improves running economy and fatigue resistance on long runs since you will not waste as much energy trying to control your upper body.

The plank: Lie face down on the floor, carpet is best, and then support yourself on your forearms and toes. Hold your body straight as a “plank,” with your butt tucked in. Hold it for 2 [women 1½ minutes is OK] minutes. Few people can hold it for 2 minutes the first few times they try. Keep at it, progress comes rapidly. You can do this drill every day. After you progress some, try lifting one limb at a time for 20 seconds or so, this activates additional muscles.

Now do the face up plank. It's exactly the same, except you are face up your forearms below your back and resting on your heels. Same times and lift one limb at a time, etc. This drill is good for men's beer bellies.

Stretching?

I hate to disillusion you; but, there is no scientific evidence that stretching before or after workouts, or any other time, has any measurable effect on injuries. There have been numerous controlled studies attempting to discern any improvement; but, all the results have only yielded statistically insignificant results, [1%, 2% e.g.] In fact, one large controlled study of 1538 Australian army recruits undergoing basic training found stretching, following warmups, was statistically insignificant. One half stretched and control group did not. Other controlled experiments have shown stretching before workouts actually increased the incident of injuries. One positive note: Stretching after workouts and races appears to reduce injuries, but only slightly. If you would like to learn more about stretching, I urge you to get a copy of Running Research News, Volume 22 Issue 4. Owen covers the subject in depth and explains the apparent contradiction.

Bottom Line, Injury Prevention

To minimize injuries:

Allow at least one day, two days following a hard race, of rest for your muscles cells to recover, even if you have no soreness symptoms. Recall, above in "Chronic Overuse Injuries" and "Delayed Onset Injuries," that muscles cells can be severely damaged and you may not have any soreness symptoms.

Strengthen your hams, calves and your running gear in general with weight or resistance training. Women, in particular, should do the plank, as described in "Specific Local Injuries: Iliotibial Band Friction Syndrome". However, men get ITBS also; plus it's good for your running economy and fatigue resistance.

Incidentally, the plank is great exercise for curing lower back pain, it's far better than strength training.

Objective Oriented Training

This program is designed to help you achieve specific racing goals. Therefore, it is imperative that you always pick a target race, well in advance, for achieving the goal. This race must be at least 6 weeks in the future, proportionally longer if your ambitions are very high or your current condition is not already reasonably good. Dr. Daniels explicitly states that it takes about 6 weeks of serious training to reach a new plateau of performance. All your training should be focused on that race, it's your target.

Every time you do a training run, it should be for a specific purpose toward achieving that goal. The paper "Cardinal Rules" addresses this point. Obviously, all your training will include intervals, sprints, hills and fatigue resistance improvement long runs. However, suppose your target course is particularly hilly, then include extra hill workouts in your schedule.

Run a few races as training runs before your target race.

The Science of Sharpening [peaking] Training

I'm adding this as a place marker for myself so I don't forget the subject later in the series. Dr. Noakes has a super discussion on this topic, page 304, "Lore of Running." I highly recommend reading it if you are an active racer.

Fun Runs

I'd like to repeat "You should include many days of running just for the pure joy, no particular workout, time, speed or distance. Remember, running is just a hobby for most of us, so enjoy it."

No matter how focused you are in qualifying for Boston, or setting a new 10K PR, make certain you do fun runs every week or two. The rest and relaxation will make you stronger.

A Simple Quiz

Here is a simple question to test your understanding of the material presented so far. My local running club has, for over 30 years, scheduled a progressive mileage increase program to train for the fall marathons. The schedule includes, for its Sunday runs, an increase of 1 mile, every two weeks, starting at 10 miles and ending at 20 miles. What is your opinion of this program for seasoned racers, whether it's their first marathon or not? Before answering the question, reread this paper.

Your Tasks

If you want to participate in the program, you must round up all your PR times and your age, at the time, for all 5Ks, 10Ks, 10milers and marathons you've run. Next, find a race about two months from now that will be your training target; this is very important.