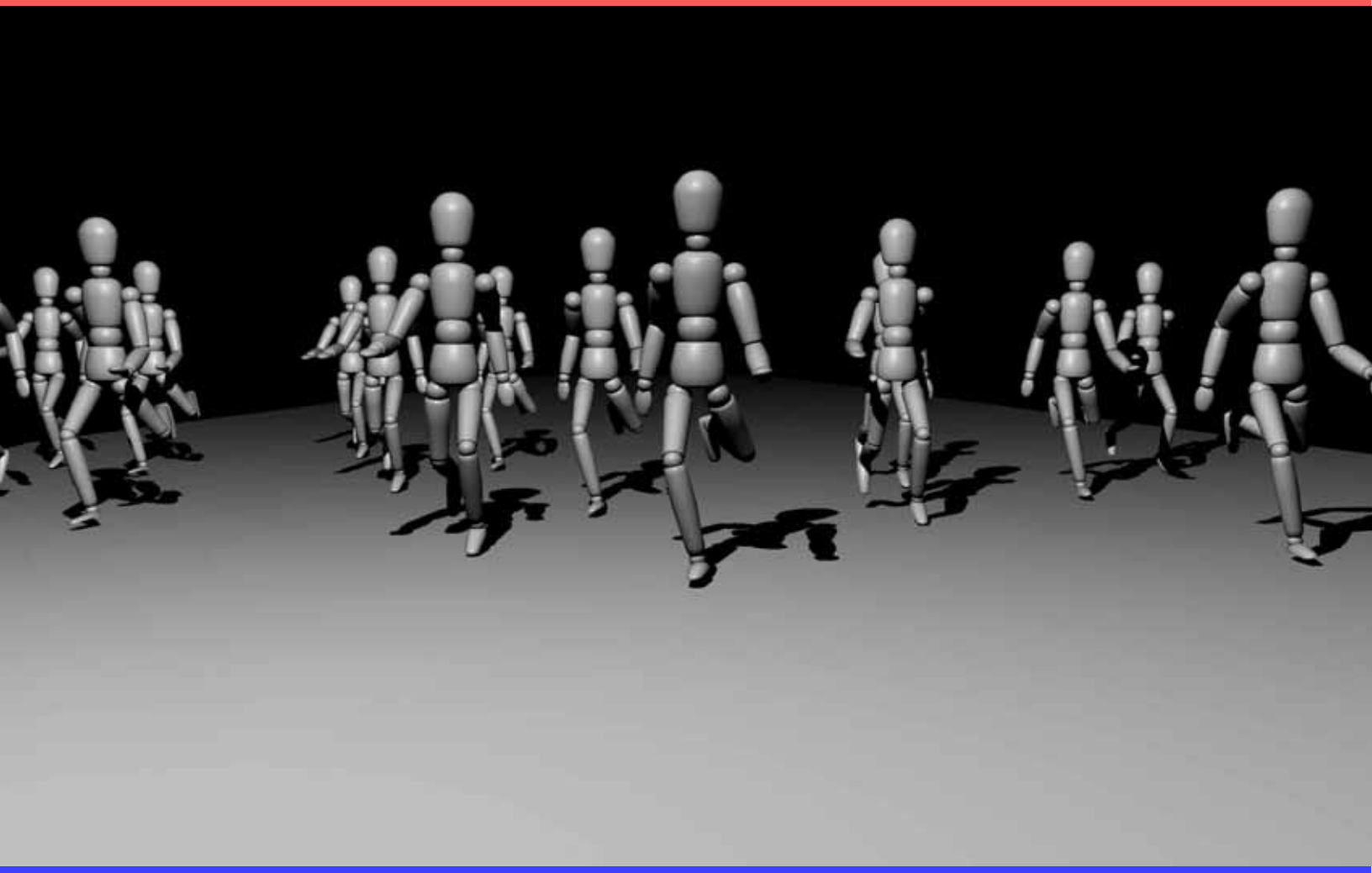
4 Hour 10 Minute Marathon Training Program



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Program Overview

Is This Program For You

Before beginning this program, you should be sure that a 4 hour 10 minute pace is a reasonable goal for you. You must maintain a 9:33 average pace per mile which is equal to a 5:56 per kilometer pace. If you have run a recent marathon that is in the 4 hours 11 minutes to 4 hours 20 minutes, this is an achievable goal for you. If your current personal best is 4 hours 21 minutes to 4 hours 25 minutes, this goal is possible, but will be very difficult. If your time is currently over 4 hours and 25 minutes, I would highly recommend setting a more easily achievable goal of about 10 minutes faster than your current time. Once you meet that goal, you can keep advancing toward a 4 hour 10 minute marathon.

This program assumes that you are in good running condition and are prepared to undertake strenuous marathon training. Most runners that are at this level maintain a high level of fitness on a year round basis. They will take time off for recovery during the year, but are never far from their base of fitness and never far from race shape. If you have not been running for a long period of time, you will need to rebuild a base of fitness before starting a marathon training program.

"Barring injury or illness a competitive runners is never far from their base of fitness and is never far from race shape."

If you are like most competitive runners, you are never far from race shape. Barring injury or illness, the typical competitive runner trains year round with some planned time off for recovery. A period of rest is a critical part of your training year. You will always have short periods of recovery following a race. The longer the race, the longer that immediate recovery period will be. Most runners will recover for 2 to 5 days following a 5K or 10K race and for 2 weeks or more following a marathon. In addition to the short periods of race recovery, it is a good idea to plan a recovery period of 2 to 4 weeks after your race season in order to restore the strength of both your body and your spirit, so that you are mentally and physically fresh and ready to run for the following race season.

It is after that planned period of rest, that you will want to rebuild and improve upon your base of endurance and strength that will support your training for the coming year.

This program is broken up into phases. The first phase is a pre-season schedule. This is commonly referred to as “base building” I do not like the term “base building” because it suggests that something must be built from the ground up. As I said earlier, competitive runners are never far from their base and never far from race shape. The pre-season training schedule is designed to refocus and strengthen the base that has already been built over years of consistent running.

The pre-season phase, as well as all other phases, is based on multi-pace training, and includes endurance, speed endurance and speed work. The emphasis will be on endurance training, but it is necessary to include both speed endurance and speed work so that you will maintain both your lactate threshold level and your footspeed. If you are not coming off a period of recovery and consider yourself in proper condition to start a marathon training program, you should be able to skip the pre-season build up schedule.

Multi-pace training is a training method in which a variety of running paces and workouts are included throughout the training year. This type of training will insure that all of your energy producing systems and muscle types are kept conditioned all year long. In my opinion, training methods that use “blocks” of mostly single pace training promotes injury and causes a detraining of the ignored muscle fiber types and energy sytems. Instead of advancing from slow base training to stamina and finally speed, as in traditional single pace training - multi-paced training includes a mix of endurance, lactate threshold, VO2 max, speedwork, hill workouts and strength workouts throughout your schedule. Workouts gradually become more and more focused on your time and distance goal as you progress through your training schedule.

Following the pre-season schedule, there is a 20 week marathon training program. Again, if you are not coming off a period of rest, recovery or injury, and are able to run 14 miles comfortably, you should be able to jump right into the marathon training schedule.

Program Components

For many years, the standard training run for all long distances from 5K to the marathon, was the tempo run. This is a workout that is performed at a pace that is very close to your lactate threshold pace. The lactate threshold is the point at which the rate of lactic acid accumulation and your bodies ability to clear that lactic acid is roughly at equilibrium. The thinking behind that theory is that exercising at your lactate threshold level will train your body to process the accumulating lactic acid more quickly and as a result, raise your lactate threshold.

There are a couple of problems with placing an emphasis on tempo running. The problem with too much emphasis on this type of training is that when doing a tempo run, you are running at your lactate threshold (LT). In order make any considerable improvements in your LT you must flood your bloodstream with lactic acid. When you are running right at your LT, the accumulation of lactic acid and your bodies ability to clear the compound is roughly at equilibrium. You must train at a pace that is above your LT so that there is a sufficient amount of lactic acid in your blood to force your body to improve it’s ability to clear and process the lactic acid.

Tempo runs are a valuable part of any training program, but they should not make up the bulk of the program. Tempo runs are useful for training your body to maintain a quality pace for long distances.

This program will use some tempo runs, but will concentrate on lactate threshold workouts performed at faster than lactate threshold pace. In addition to LT pace runs, it is necessary to do some training faster than both your LT pace and your goal pace. These faster paced runs will improve the oxidative ability of your muscles. This means you muscles ability to extract and use the oxygen that is delivered by your heart and lungs. This is commonly referred to as your VO_2 max. Fast running also recruits and strengthens fast twitch muscles in your legs that are not utilized during slower paced running.

Long runs will be included on a weekly or bi-weekly basis. Long runs are endurance runs that will improve the blood flow to your exercising leg muscles and will build and maintain an endurance base.

The final major component of your training program is hill training. Hill training is an excellent way to improve your running strength, running economy and VO_2 max.

This program utilizes a simple multi-pace training system. This means that you will do each of the following workouts on a weekly basis
:

- Lactate Threshold Training Runs at or near goal 10K pace or Tempo Runs
- Speed Workouts
- Hill Workouts
- Long Runs - including some goal pace long runs
- Easy Runs

The same pattern will be followed throughout your training program. You will progress from more broad based, general workouts to more race specific and focused workouts.

In addition to your running workouts, I will suggest a weekly strength training program. The inclusion of strength training into your program, while not essential, will help you achieve your goal. Strength training will improve your speed, power and running economy.

The Workouts

Each workout will have a suggested training pace. It will be very difficult to run at this exact pace. Try to maintain a pace that is within 5 seconds of this pace. This means if your training run calls for a pace of 6:30 per mile, you should try to maintain a pace of between 6:25 per mile and 6:35 per mile.

Standard Warm Up

Before you start any hard workout, you must warm up your cold muscles. Jog at an easy pace for 10 to 15 minutes or until completely warm. Do 5 to 6 strides. Strides are short 50 to 100 meter runs in which you start at an easy pace and smoothly accelerate to nearly full pace. Do some light active stretching.

Cool Down

It is also important to cool down after your workout. Do not suddenly stop. Cool down after each workout with 5 minutes of easy jogging and/or walking.

Tempo Runs

These are medium distance runs that are performed at near your lactate threshold or about 10 to 15 seconds per mile slower than your 10K pace.

Lactate Threshold Runs

These workouts are long interval runs that are performed at or near your 10K pace. The purpose of LT training is to improve your muscles ability to process the lactic acid that is produced at higher intensity running speeds. A higher lactate threshold means that you will be able to maintain a faster pace for longer distances.

Supersets

Supersets are combinations of various speed and distance run with no rest between the various components. These workouts are very good at improving your lactate threshold because they flood your bloodstream with lactic acid and force your body to process and clear that lactic acid while you are still running at a quality pace. These workouts also improve your VO_2 max and prepare you to deal with high intensity race situations. These workouts are preformed at between 5K pace and marathon pace.

Speed Training

These are shorter and faster paced repeats. These repeats will improve your VO_2 max, which is the maximum amount of oxygen your body can process. This is a predictor of performance potential. These workouts also improve your running economy and overall speed. You will be doing these workouts at between your 5K pace and 3K pace.

Speedwork isn't just for sprinters. It is an important workout for any competitive marathon runner.

Hill Training

Hill training is one of the most effective ways to improve your running strength, running economy and VO_2 max. These hill workouts may range from longer, more gentle hills to shorter and steeper hills. If you do not have appropriate hills in your area, try to do these workouts on a treadmill.

Long Runs

Long runs are important for building your running endurance. There are two types of long runs you will be doing. One type is long, stead easy runs that will be done at around approximately 1 1/2 minutes slower than your planned marathon goal pace. The purpose of these runs are to improve the blood delivery to your working muscles, improve your fat burning ability and get your body accustomed to long periods of time "on your feet". The second type of long run is performed partially at goal race pace. These are very important training runs that teach your body to run long at race pace.

Goal pace long runs are a critical part of your training program. Easy paced long runs are great for increasing your overall endurance and training you to spend the required time "on your feet". The problem with easy paced long runs is that they do not prepare you to run long distances at your race pace. Including dedicated goal pace long runs and also dual pace long runs in which you run part of your workout at an easy endurance pace and part at goal pace will get you ready for your next PR. You should build up to doing about half of your longest run at goal pace, three weeks before your race.

Easy Runs

These are easy pace runs. Some of these workouts are for recovery and are run at a very easy pace, while others are easy pace runs performed at about one minute slower than marathon goal pace.

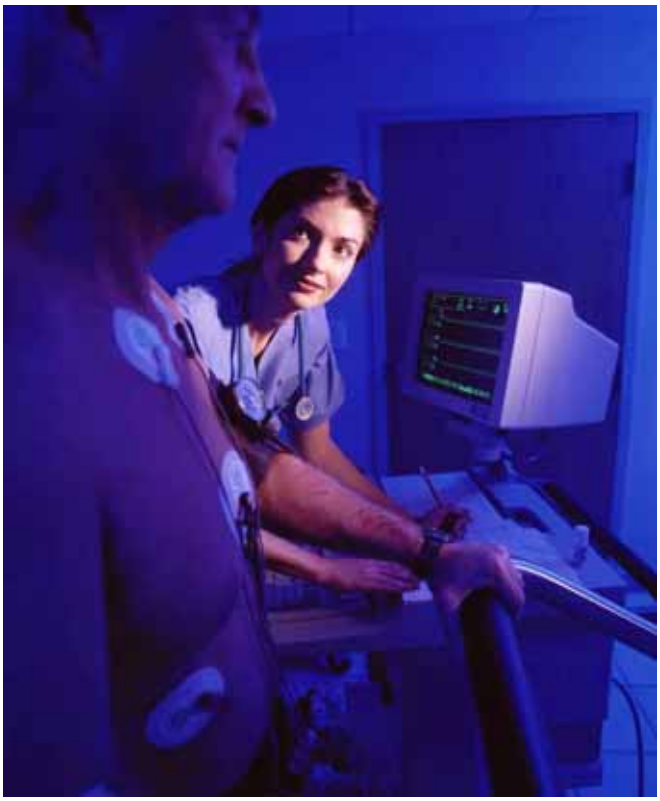
Metric Conversion

The workout paces on the training schedule are listed in minute per mile. Below are metric conversions for all paces used.

- 7:58 per mile equals 4:56 per kilometer
- 8:13 per mile equals 5:06 per kilometer
- 8:28 per mile equals 5:15 per kilometer
- 8:43 per mile equals 5:24 per kilometer
- 9:33 per mile equals 5:56 per kilometer
- 10:00 per mile equals 6:12 per kilometer
- 10:40 per mile equals 6:37 per kilometer

Are You Physically Ready To Train

Before starting any exercise program, you should consult with your doctor to be sure you are cleared for intense activity. Any physical activity has the potential to cause injuries and/or serious medical conditions.



If you have any doubt about your medical readiness for highly strenuous marathon training - get a check up. It is better to be safe than sorry.

According to the American College of Sports Medicine, the minimum testing standard is the Physical Activity Readiness Questionnaire (PAR-Q). This is a questionnaire that is written to provide individuals a way to perform a simple self assessment of their readiness to engage in an exercise program.

The questionnaire asks the following seven questions:

- Has a doctor ever said that you have a heart condition and recommended only medically supervised activity?
- Do you have any chest pain brought on by physical activity?
- Have you developed chest pain in the past month?
- Do you tend to lose consciousness or fall over as a result of dizziness?
- Do you have a bone or joint problem that could be aggravated by the proposed physical activity?
- Has a doctor ever recommended medication for your blood pressure or heart condition?
- Are you aware through your own experience, or a doctor's advice, of other physical reason against your exercising without medical supervision?

If you answered yes to one or more of the above questions, you must consult with your doctor before beginning any exercise program. If you answered no to all questions, you are reasonably assured that you are ready for an exercise program in which you will make gradual increases in the level of the activity. However, you should also consult with your doctor if any of the following apply to you:

- Over 40 years of age
- You are a smoker
- You have high blood pressure
- You have diabetes
- You have asthma
- You have lived a sedentary lifestyle
- You have a family history of cardiovascular disease
- You have high cholesterol

In addition to medical conditions, you must assess your musculoskeletal condition. If you have any prior injuries to your joints, any chronic back pain, any chronic joint pain or muscle injuries, check with your doctor before starting to run.

Use you own common sense. If you feel there is any possible risk at all, you should check with your doctor before running. It is much better to err on the safe side, than to suffer a serious injury or illness.

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4 Hour and 10 Minute Marathon Training Program

Pre-Season Schedule

This is an 8 week build up program. The following pattern will be followed throughout the program:

Day 1 - Easy run or rest
Day 2 - Lactate Threshold Run or Tempo Run
Day 3 - Easy run or rest
Day 4 - Speed Training
Day 5 - Easy Run
Day 6 - Hill Training
Day 7 - Long Run or Goal Pace Long Run

You do not have to follow this exact sequence. If you would rather do your long run on day 1 and your speed work on day 7, that is OK. You may follow any pattern that you prefer as long as do all of the training runs and allow a rest day in between hard workouts.

Many athletes like to do some of their training on the treadmill. Feel free to do any of these workouts on the treadmill. For many runners, it is necessary to perform hill training on the treadmill because they do not have access to hills where they live. I would suggest doing some of your workouts on the track, road or trail. If you do all of your training on the treadmill, you will not be properly prepared for your upcoming road race.

This build up schedule will improve your fitness and endurance to a level at which you are able to complete a 14 mile long run. If you are already at that level you may skip this build up program and start with the 20 week marathon schedule.

Week 1

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	Easy Run	3 miles at 10:00 per mile
3	Easy Run	5 miles at 10:00 per mile
4	800 meter repeats	3 x 800 meters in 4:05 per 800 meters. Recover between the repeats with 400 meters at an easy pace.
5	Easy Run	4 miles at 10:00 per mile
6	Easy Run	4 miles at 10:00 per mile
7	Long Run	5 miles at 10:40 per mile

Week 2

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	Easy Run	4 miles at 10:00 per mile
3	Easy Run	5 miles at 10:00 per mile
4	800 meter repeats	4 x 800 in 4:05 per 800 meters. Recover between the repeats with 400 meters at an easy pace.
5	Easy Run	4 miles at 10:00 per mile
6	Easy Run	4 miles at 10:00 per mile
7	Long Run	6 miles at 10:40 per mile

Week 3

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	Easy Run	4 miles at 10:00 per mile
3	Easy Run	6 miles at 10:00 per mile
4	800 meter repeats	5 x 800 meter repeats in 4:05 per 800 meters. Recover between the repeats with 400 meters at an easy pace.
5	Easy Run	5 miles at 10:00 per mile
6	Easy Run	4 miles at 10:00 per mile
7	Long Run	7 miles at 10:40 per mile

Week 4

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	Tempo Run	5 miles at 8:43 per mile
3	Easy Run	6 miles at 10:00 per mile
4	800 meter repeats	6 x 800 meters in 4:05 per 800 meters. Recover between the repeats with 400 meters at an easy pace.
5	Easy Run	5 miles at 10:00 per mile
6	Easy Run	5 miles at 10:00 per mile
7	Long Run	8 miles at 10:40 per mile

Week 5

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	One Mile Repeats	3 x 1 mile repeats in 8:28 per each mile repeat. Recover between each repeat with 800 meters at an easy pace
3	Easy Run	5 miles at 10:00 per mile
4	800 meter repeats	6 x 800 meters in 4:05 per 800 meter repeat. Recover between each repeat with 400 meters at an easy pace.
5	Easy Run	5 miles at 10:00 per mile
6	Easy Run	5 miles at 10:00 per mile
7	Long Run	9 miles at 10:40 per mile

Week 6

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	Tempo Run	6 miles steady at 8:43 per mile
3	Easy Run	6 miles at 10:00 per mile
4	800 meter repeats	6 x 800 meter repeats in 4:05 per 800 meters. Recover between each repeat with 400 meters at an easy pace
5	Easy Run	5 miles at 10:00 per mile
6	Easy Hills	5 miles on a hilly or rolling course at 10:00 per mile.
7	Long Run	10 miles at 10:40 per mile

Week 7

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	One Mile Repeats	4 x 1 mile repeats in 8:28 per mile. Recover between each repeat with 800 meters at an easy pace.
3	Easy Run	6 miles at 10:00 per mile
4	800 meter repeats	6 x 800 meter repeats in 4:05 per 400 meters. Recover between each repeat with 400 meters at an easy pace.
5	Easy Run	8 miles at 10:00 per mile
6	Easy Run	6 miles at 10:00 per mile
7	Long Run	12 miles at 10:40 per mile

Week 8

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	Tempo Run	6 miles at 8:43 per mile
3	Easy Run	8 miles at 10:00 per mile
4	800 meter repeats	6 x 800 meter repeats in 4:05 per 800 meters. Recover between each repeat with 400 meters at an easy pace
5	Easy Run	8 miles at 10:00 per mile
6	Easy Hills	6 miles on a hilly or rolling course at 10:00 per mile
7	Long Run	14 miles at 10:40 per mile

20 Week Marathon Program

This is a 20 week program. The following pattern will be followed throughout the program:

Day 1 - Easy run or rest
Day 2 - Lactate Threshold Run or Tempo Run
Day 3 - Easy run or rest
Day 4 - Speed Training
Day 5 - Easy Run
Day 6 - Hill Training
Day 7 - Long Run or Goal Pace Long Run

Week 1

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	Tempo Run	6 miles at 8:43 per mile
3	Easy Run	6 miles at 10:00 per mile
4	800 Meter Repeats	4 x 800 meter repeats in 4:05 per 800 meters. Recover between each repeat with 400 meters at an easy pace
5	Easy Run	5 miles at 10:00 per mile
6	Hills	Run 4 miles on a hill or rolling course at 10:00 per mile
7	Long Run	14 miles at 10:40 per mile

Week 2

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	One Mile Repeats	3 x 1 mile repeats at 8:28 per mile pace. Recover between each repeat with 800 meters at an easy pace
3	Easy Run	6 miles at 10:00 per mile
4	800 Meter Repeats	5 x 800 meter repeats in 4:05 per 800 meters. Recover between the repeats with 200 meters at an easy pace.
5	Easy Run	6 miles at 10:00 per mile
6	Hills	5 miles on a hilly course at 10:00 per mile
7	Long Run	15 miles at 10:00 per mile

Week 3

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	One Mile Repeats	4 x One Mile Repeats at 8:28 per mile. Recover between the repeats with 800 meters at an easy pace
3	Easy Run	6 miles at 10:00 per mile
4	800 Meter Repeats	6 x 800 meter repeats in 4:05 per 800 meters. Recover between each repeat with 400 meters at an easy pace
5	Easy Run	6 miles at 10:00 per mile
6	Hills	5 miles on a hilly course at 10:00 per mile
7	Long Run	16 miles at 10:40 per mile

Week 4

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	LT Workout	Run 1 mile at 10:00 per mile. Then speed up to your goal marathon pace of 9:33 per mile for 4 miles. Slow down to 10:00 per mile for the last mile of this 6 mile workout
3	Easy Run	6 miles at 10:00 per mile
4	800 Meter Repeats/400 meter repeats	7 x 800 meter repeats in 4:05 per 800 meters. Recover between each repeat with 400 meters at an easy pace. Then run 4 x 400 meter repeats in 1:58 per 400 meters. Recover with 200 meters at an easy pace between the repeats. Recover with 800 meters at an easy pace between the two sets.
5	Easy Run	6 miles at 10:00 per mile
6	Hills	6 miles on a hilly course at 10:00 per mile
7	Long Run	10 miles at 10:00 per mile

Week 5

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	One Mile Repeast with surge	5 x 1 mile repeats in 8:28 per mile. Recover between each 1 mile repeat with 400 meters at an easy pace. After the last 1 mile repeat, run 400 meters at nearly full pace with no recovery
3	Easy Run	6 miles at 10:00 per mile
4	800 Meter Repeats/400 Meter Repeats	8 x 800 meter repeats in 4:05 per 800 meters. Recover between each repeat with 400 meters at an easy pace. Then run 6 x 400 meter repeats in 1:58 per 400 meters. Recover with 200 meters at an easy pace betwen the repeats. Recover with 800 meters at an easy pace between the 2 sets
5	Easy Run	6 miles at 10:00 per mile
6	Hills	8 miles on a hilly course at 10:00 per mile
7	Long Run	17 miles at 10:40 per mile

Week 6

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	LT Workout	Run 3 x 1200 meter repeats at 8:13 per mile. Recover between the three repeats with 400 meters at an easy pace. Then run 2 miles at 8:28 per mile
3	Easy Run	6 miles at 10:00 per mile
4	800 Meter Repeats	8 x 800 meter repeats in 4:05 per 800 meters. Recover between each repeat with 400 meters at an easy pace.
5	Easy Run	6 miles at 10:00 per mile
6	Hills	8 miles on a hilly course at 10:00 per mile
7	Long Run	10 miles at 10:00 per mile

Week 7

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	One Mile Repeats	6 x One Mile Repeats in 8:28 per mile. Recover between the repeats with 400 meters at an easy pace
3	Easy Run	6 miles at 10:00 per mile
4	Superset	2 x 800/400/1600 meter supersets. Run 800 meters at 8:13 per mile pace, 400 meters at 7:58 per mile pace and 1600 meters at 8:28 per mile pace. No rest between the distances. Recover between the two sets with 800 meters at an easy pace.
5	Easy Run	6 miles at 10:00 per mile
6	Hills	8 miles on a hilly course at 10:00 per mile
7	Long Run	18 Miles at 10:40 per mile

Week 8

Day	Workout	Comments
1	Rest	Total Rest
2	LT Workout	Run 3 miles at 8:28 per mile. Then slow down to goal marathon pace of 9:33 per mile for 4 miles. Now speed up to 8:13 per mile for the last mile of this 8 mile workout
3	Easy Run	6 miles at 10:00 per mile
4	Superset	1 x 2400/800/400 superset. Run 2400 meters at 8:28 per mile pace, 800 meters at 8:13 per mile pace and 400 meters at 7:58 per mile pace
5	Rest	Total Rest
6	Hill Repeats	8 x 200 meter hill repeats. Run 200 meters up a steep hill of 8 to 12 percent grade Run up the hill at the fastest pace you can maintain for the entire workkout. Jog down the hill as recovery between repeats.
7	Long Run	10 Miles at 10:00 per mile

Week 9

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	LT Workout	Run 2 x 2400 meters at 8:28 per mile pace. Recover between the repeats with 800 meters at an easy pace. Then run 1 mile at 8:13 per mile pace
3	Easy Run	6 miles at 10:00 per mile
4	1 Mile Repeats	3 x 1 mile repeats at 8:13 per mile pace. Recover between the three repeats with 400 meters at an easy pace.
5	Easy Run	6 miles at 10:00 per mile
6	Hill Repeats	9 x 200 meter hill repeats. Run 200 meters up a steep hill of 8 to 12 percent grade Run up the hill at the fastest pace you can maintain for the entire workkout. Jog down the hill as recovery between repeats.
7	Long Run	20 miles at 10:40 per mile pace

Week 10

Day	Workout	Comments
1	Rest	Total Rest
2	LT Workout	Run one mile at 10:00 per mile pace. Then speed up to goal marathon pace of 9:33 per mile for 6 miles before slowing to 10:00 per mile for the last mile of this 8 mile run
3	Easy Run	6 miles at 10:00 per mile
4	Superset	2 x 2400/800/400 meter supersets. Run 2400 meters at 8:28 per mile pace, 800 meters at 8:13 per mile pace and 400 meters at 7:58 per mile pace. No rest between the distances. Recover between the two sets with 800 meters at an easy pace
5	Easy Run	6 miles at 10:00 per mile
6	Hills	9 miles on a hilly course at 10:00 per mile
7	Goal Pace Long Run	8 miles at 9:33 per mile pace

Week 11

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	LT Workout	7 x 1 mile repeats at 8:28 per mile pace. Recover with 400 meters at an easy pace between the repeats
3	Easy Run	6 miles at 10:00 per mile
4	Speed Intervals	Run 30 minutes alternating between 30 seconds at 7:58 per mile and 30 seconds at 10:00 per mile
5	Easy Run	8 miles at 10:00 per mile
6	Hill Climb	7 miles on a long steady hill of 4 to 8 percent grade at 10:00 per mile
7	Long Run	Run 12 miles at 10:00 per mile then speed up to goal marathon pace of 9:33 per mile for the last 5 miles of this 17 mile workout

Week 12

Day	Workout	Comments
1	Rest	Total Rest
2	LT Workout	3 x 2400 meter repeats at 8:28 per mile pace
3	Easy Run	6 miles at 10:00 per mile
4	Speed Intervals	Run 20 minutes alternating between 30 seconds at 7:58 per mile and 30 seconds at 9:33 per mile pace
5	Rest	Total Rest
6	Hill Climb	8 miles on a long steady hill of 4 to 8 percent grade at 10:00 per mile
7	Goal Pace Run	10 Miles at your goal pace of 9:33 per mile

Week 13

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	LT Workout	Run 1 mile at 10:00 pace. Then speed up to goal pace of 9:33 per mile for 6 miles. Speed up to 8:28 per mile pace for 2 more miles before slowing to 10:00 pace for the last mile of this 10 mile run
3	Easy Run	6 miles at 10:00 per mile
4	One Mile Repeats	4 x 1 mile repeats at 8:13 per mile. Recover with 200 meters at an easy pace between the repeats.
5	Easy Run	6 miles at 10:00 per mile
6	Hill Repeats	12 x 200 meter hill repeats. Run 200 meters up a steep hill of 8 to 12 percent grade Run up the hill at the fastest pace you can maintain for the entire workkout. Jog down the hill as recovery between repeats.
7	Long Run	Run 12 miles at 10:00 pace, then speed up to goal pace of 9:33 per mile for the last 7 miles of this 19 mile run

Week 14

Day	Workout	Comments
1	Rest	Total Rest
2	LT Workout	Run 3 miles at 8:28 per mile pace. Then slow down to goal race pace of 9:33 per mile for 7 miles before finishing this 11 mile workout with 1 mile at 8:13 per mile pace
3	Easy Run	6 miles at 10:00 per mile
4	Superset	2 x 400/800/2400 supersets. Run 400 meters at 7:58 per mile pace, 800 meters at 8:13 per mile pace and 2400 meters at 8:28 per mile pace. No rest between the distances. Recover between the 2 sets with 800 meters at an easy pace
5	Easy Run	6 miles at 10:00 per mile
6	Hills	6 miles on a hilly course at 10:00 per mile
7	Goal Pace Run	10 miles at 9:33 per mile

Week 15

Day	Workout	Comments
1	Rest or Very Easy	Total rest or 2 to 5 miles at 10:40 per mile
2	One Mile Repeats	5 x 1 mile repeats in 8:28 per mile. Recover between each 1 mile repeat with 400 meters at an easy pace. After the last 1 mile repeat, run 400 meters at nearly full pace with no recovery
3	Easy Run	8 miles at 10:00 per mile
4	Speed Intervals	Run 30 minutes alternating between 30 seconds at 7:58 per mile and 30 seconds at 9:33 per mile pace
5	Rest	Total Rest
6	Hill Climb	5 miles on a long steady hill of 4 to 8 percent grade at 10:00 per mile
7	Long Run	Run 11 miles at 10:00 per mile pace, then speed up to goal pace of 9:33 per mile for 9 miles. Finish this 21 mile workout with 1 mile at 8:28 per mile pace

Week 16

Day	Workout	Comments
1	Rest	Total Rest
2	One Mile Repeats	7 x 1 mile repeats in 8:28 per mile. Recover between each 1 mile repeat with 400 meters at an easy pace. After the last 1 mile repeat, run 400 meters at nearly full pace with no recovery
3	Easy Run	10 miles at 10:00 per mile
4	Superset	1 x 800/1600/3200/1600/800 superset. Run the 800 meters at 8:13 per mile pace, the 1600 at 8:28 per mile pace and the 3200 at 9:33 per mile pace. Take no rest between the distances
5	Easy Run	8 miles at 10:00 per mile pace
6	Easy Run	6 miles at 10:00 per mile pace
7	Goal Pace Run	12 miles at goal pace of 9:33 per mile

Week 17

Day	Workout	Comments
1	Rest	Total Rest
2	One Mile Repeats	8 x 1 mile repeats in 8:28 per mile. Recover between each 1 mile repeat with 400 meters at an easy pace. After the last 1 mile repeat, run 400 meters at nearly full pace with no recovery
3	Easy Run	10 miles at 10:00 per mile
4	Superset	2 x 800/1600/3200/1600/800 superset. Run the 800 meters at 8:13 per mile pace, the 1600 at 8:28 per mile pace and the 3200 at 9:33 per mile pace. Take no rest between the distances. Recover between the two sets with 800 meters at an easy pace
5	Easy Run	7 miles at 10:00 per mile pace
6	Easy Run	5 miles at 10:00 per mile pace
7	Long Run	Run 11 miles at 10:00 per mile pace, then speed up to goal pace of 9:33 per mile for 11 miles and finish this 23 mile workout with one mile at 8:28 per mile

Week 18

Day	Workout	Comments
1	Rest	Total Rest
2	5K Repeats	2 x 5K repeats at 8:28 per mile pace. Recover between the two sets with 800 meters at an easy pace
3	Easy Run	6 miles at 10:00 per mile
4	Speed Intervals	Run 30 minutes alternating between 30 seconds at 7:58 per mile and 30 seconds at 9:33 per mile pace
5	Easy Run	6 miles at 10:00 per mile
6	Easy Run	4 miles at 10:00 per mile
7	Goal Pace Run	8 miles at goal pace of 9:33 per mile

Week 19

Day	Workout	Comments
1	Rest	Total Rest
2	800 meter repeats	8 x 800 meter repeats at 7:58 per mile pace. Recover between the repeats with 200 meters at an easy pace
3	Easy Run	6 miles at 10:00 per mile
4	Speed Intervals	Run 20 minutes alternating between 30 seconds at 7:58 per mile and 30 seconds at 9:33 per mile pace
5	Easy Run	6 miles at 10:00 per mile pace
6	Easy Run	4 miles at 10:00 per mile pace
7	Goal Pace Run	6 miles at goal pace of 9:33 per mile

Week 20

Day	Workout	Comments
1	Rest	Total Rest
2	LT Workout	Run 5000 meters at 8:28 per mile pace
3	Easy Run	4 miles at 10:00 per mile
4	Easy Run	2 miles at 10:00 per mile
5	Rest	Total Rest
6	Rest	Total Reset
7	Race	Race Day

3

Strength Training

Purpose of Strength Training

Strength training isn't just for body builders and football players anymore. Runners can benefit greatly from a properly designed strength-training program. In fact, most runners will never reach their peak level of performance without strength training. Training methods in the past and still today have ignored the benefits of strength training. Many coaches and athletes have even avoided strength training because of the mistaken belief that the increase in muscle mass will slow down or decrease the endurance of the runner. Current research has proven that this is not true. Strength training is a vital component of any runners training regime.

Many distance runners make the mistake of eliminating strength training from their program. Properly designed strength training will improve your power, speed, running economy and will help prevent injuries

There are many benefits of strength training. As a runner, the primary benefits are: injury prevention; increased power; increase speed, increased stride length and running economy.

Injury Prevention

The repetitive stresses of running places great demands on the muscles, ligaments, tendons and joints. Nothing will totally prevent the occurrence of injuries. However, strength training will provide a defense against these overuse injures. When injuries do occur, an improved level of strength will decrease the severity of injuries and decrease the recovery time.

Strength training protects your body from injuries in several ways. The muscles fibers themselves are strengthened which will help prevent muscle pulls and tears. Muscle mass is increased which will help provide support to the joints, which are absorbing much of the impact of running. All of the connective tissues, which include ligaments and tendons, are made stronger. This will help avoid strains, sprains and tendonitis.

Increased Power

Strength training is essential in developing speed and power, which is important even for marathon success

In physics, power is defined as "the time rate of doing work". In terms of running, power is a function of speed and strength. More simply put, power is the result of the combination of the force or strength of your stride and the velocity or speed of your stride.

During a typical running stride, you have a very small amount of time in which to generate the force necessary to propel you forward. The push off phase of the running stride is the point at which this forward motion is generated. For a sprinter, this happens in about 0.1 seconds. For a marathon runner it is between 0.3 and 0.5 seconds. To increase running speed and economy, it is necessary to maximize the force produced without increasing the time required to produce the force. This is what improving your power will do for you.

In order to increase the power of your stride, you must increase both general strength and explosive strength. General strength will increase the size of your muscle fibers, providing a base for the explosive strength training and helping prevent injuries. The explosive strength training will improve the ability of your muscles to generate its higher level of strength, in a short period of time, which will give you an increase in power.

Increased Speed

In order to maximize your running speed, you must maximize both stride length and stride rate. If either of these is less than optimal, you will not be running at your best possible pace.

Stride length is a subject that generates a lot of controversy. You will read and hear conflicting advice on stride length. Some coaches will tell you to maximize your stride length while others tell you a short stride length is more efficient. I have spent many hours videotaping and analyzing the strides of various runners, from beginners to elite class runners. From this analysis, I have found that, without a doubt, you must maximize stride length, while maintaining stride rate, in order to run at your best possible pace. The trick is to maximize stride rate naturally. If you try to unnaturally force a long stride, you will overstride, which will cause a braking action that will slow you down and possibly cause injuries.

A naturally long stride rate comes from a smooth, low to the ground stride with very little up and down motion, strong forward knee drive and a powerful push off, in addition to several other stride elements. General and explosive strength training is the key to developing these form elements.

Running Economy

Successful marathon running depends upon energy conservation. You must conserve enough energy supplies to get you to the finish line 26.2 miles away. The best way to burn less energy is to improve your running economy. If you run easy, you will win easy. Strength training will improve your running economy, stride length and foot speed. It will also decrease your ground contact time, which will take minutes off your finishing time.

One of the most reliable predictors of running performance is the velocity at which you can run at your VO2 max level. VO2 max is simply the maximum amount of oxygen that your body can process. In the past, VO2 max was the standard measure of potential running performance. Runners with the highest lab measured VO2 max, were expected to have the best performances. We now know that the velocity or speed at which an athlete can sustain while running at their VO2 max levels is a more reliable predictor of performance. The reason for this is that velocity of VO2 max takes running economy into consideration. If two runners with identical VO2 max levels are running together, the one with the most efficient running stride or running economy, will be running faster. That is because the runner with the highest level of running economy will be able to general more speed with the same VO2 max level.

Running economy is improved by maximizing stride length, maintaining stride rate, improving running form and running smoothly and effortlessly. Strength training provides the base for all of these improvements. Nearly all of the runner that I coach tell me that their running feels smoother and they feel that they are running with less effort after a period of general and explosive strength training.

PERIODIZE YOUR STRENGTH TRAINING FOR TOP PERFORMANCE

Top performance in any athletic event requires improvements in several areas of performance. Each area of performance has its own particular methods of training. It is difficult, if not impossible to train all the areas at one time. A runner must improve their VO2max, lactate threshold, strength, power, economy and event specific performance. Unfortunately, there is not one workout that will make improvements in all of these areas. That is where periodization comes in.

Periodization, in its simplest terms, is the breakdown of your training schedule into periods or “blocks” in which the emphasis is placed on one or two performance areas. Strength is one of the performance areas that must be trained, but your strength training should also be periodized.

There are many different strength training periodization schemes. The most commonly used is a gradual change from a high number of repetitions and low weight to a low number of repetitions and a high weight. This seems a sensible method because it allows your muscles to strengthen gradually with the lower weights before hitting them with the heavier weights, which give you the most strength gains. This method is an appropriate scheme for general fitness gains. However, runner's needs are different from someone interested in general fitness. A runner must prepare their body for the specific strength and power needed for top running performance. So, I have developed my own periodization scheme specifically for runners. This scheme follows a similar, gradual increase in intensity, but also progresses from general strength training to running specific strength and finally - plyometrics to develop speed and power.

This specific program has three areas of emphasis:

- General Strength Training (Base)
- Running Specific Muscle Emphasis (Strength, Power)
- Running Specific Movement Emphasis (Plyometrics)

Each of these areas of emphasis are worked on for a specific length of time or “cycle”. The length of each cycle will depend upon the overall length of your training cycle. This training program is 16 weeks in length, so each area of emphasis will be given five weeks. The final week will be used to taper and for recovery.

During weeks 1 through 6 of your program perform general strength training one time per week. .

During weeks 6 through 12 perform running specific strength training two times per week. In addition, perform general strength training one time every two week to maintain your general strength.

During weeks 13 through 18 perform plyometrics two times per week. In addition, perform running specfic strength and general strength once every two weeks.

During week 19 through 20 do not do any strength training. This is a taper week so that your muscles are fresh for the marathon.

General Strength Training

The first cycle of periodized strength training is general strength training. This will improve your basic, overall strength and will provide a good base for the more intense and specific strength training to follow. You will be performing this strength workout one time per week for the first 5 weeks of your training program:

- Bench Press or Chest Fly
- Biceps curl
- Triceps Kickback

- Bent Over Row
- Leg Extension
- Leg Curl
- Calf Raise
- Core Stabilization

Running Specific Muscle Emphasis (Running Strength)

In this phase, you will begin to work muscles that are more specific to running. These exercises will improve your running specific strength and will begin to make improvements in your power level. It will also prepare your muscles for the upcoming power phase.

You will be doing this workout one time per week in addition to some general strength exercises to maintain overall body strength.

- Bench Step Ups
- Bench Step Downs
- One Leg Squats
- Stride Step Ups

Running Specific Movements Emphasis (Plyometrics)

In this cycle you will begin to incorporate plyometric exercises. These are high intensity exercises that closely mimic the motions involved in running. The previous two cycles, general strength and running specific strength have prepared your muscles and connective tissues for this high intensity activity. Do not attempt these exercises if you have not properly prepared your body for the stress involved in these exercises. You will do these exercises two times per week in addition to some running specific strength and general strength.

- Running Bound
- One Leg Hop in Place
- Single Leg Forward Hop
- Single Leg Zig Zag Hop
- Split Lunge Jump
- Double Leg Lateral Hop and Run

General Strength Training Exercises

BENCH PRESS

This exercise can be performed using dumbbells, barbell, single or multi-station machine or resistance bands.

MUSCLES STRENGTHENED

- Primary: Pectoralis major, Coracobrachialis, Serratus anterior, Pectoralis minor, anterior deltoid
- Secondary: Triceps brachii

PARTS OF BODY STRENGTHENED

- Primary: Front of chest, front of shoulder
- Secondary: Back of upper arm

TECHNIQUE

- Lay flat on the bench.
- Contract your abdominal muscles to stabilize your trunk and spine.
- Grasp the weight with your palms facing away from your body.
- Keep your elbows pointing away from your body.
- Slowly push the weight away from your body and slightly towards the inside of your body. Push until your arms are straight, but do not lock your elbows.
- Slowly return to the starting position.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Exhale on the upward portions and inhale on the downward portion.
- Do not arch your back.
- Control the weight throughout the exercise.
- On the downward phase do not allow your arms to be pushed back to the limit of their motion. At this point your shoulder joints are being stressed excessively.

CHEST FLY

This exercise can be performed using dumbbells, single or multi-station machine or resistance bands.

MUSCLES STRENGTHENED

- Primary: Pectoralis major, Coracobrachialis
- Secondary: Anterior deltoid

PARTS OF BODY STRENGTHENED

- Primary: Chest
- Secondary: Front of shoulder

MOTIONS STRENGTHENED

Pushing, punching, throwing, shooting a basketball, serving a tennis ball, serving a volleyball.

TECHNIQUE

- Lay flat on the bench.
- Contract your abdominal muscles to stabilize your trunk and spine.
- Grasp the weight with your hands in a neutral position, like you are holding a candle or glass of water. Your palms should face each other when your arms are extended.
- Hold the weights with your arms extended away from your body, Rotate the weights so that your palms face each other. Slightly flex or bend your elbows.
- Move the weights outward in a wide arc. Keep the angle or bend at your elbow stationary. Keep your palms up and your elbows pointed towards the floor.
- Slowly lower the weights until they are approximately even with the shoulders. Do not allow the weights to go as low as the limit of your range of motion (where your shoulders won't move any farther).
- Push the weights back up following the same wide arc and keeping the angle at your elbow stationary.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Exhale on the upward portions and inhale on the downward portion.
- Do not arch your back.
- Control the weight throughout the exercise.
- On the downward phase do not allow your arms to be pushed back to the limit of their motion. At this point your shoulder joints are being stressed excessively.

BICEPS CURL

This exercise can be performed using dumbbells, barbell, single or multi-station machine, cable machine, or resistance bands.

MUSCLES STRENGTHENED

- Primary: Biceps brachii, Brachialis
- Secondary: Brachioradialis, Pronator teres

PARTS OF BODY STRENGTHENED

- Primary: Front of upper arm
- Secondary: Forearm

MOTIONS STRENGTHENED

Chinning and climbing motions. Carrying objects with the arms.

TECHNIQUE

- Standing upright, grasp the weight with your palms facing away from the front of your body.
- Contract your abdominal muscles to stabilize your trunk and spine.
- Keep your upper arms against your ribs and perpendicular to the floor.
- Slowly raise the weight by flexing your arms at your elbows. Keep your upper arms stationary. Raise the weight to the limit of your natural motion.
- Slowly return to the starting position.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Exhale on the upward portions and inhale on the downward portion.
- Do not arch your back. Keep your body still and straight
- Control the weight throughout the exercise.

TRICEPS KICKBACK

This exercise can be performed using dumbbells, barbell, cable machine or resistance bands.

MUSCLES STRENGTHENED

- Primary: Triceps brachii
- Secondary: Latissimus dorsi

PARTS OF BODY STRENGTHENED

- Primary: Back of upper arm
- Secondary: Mid and lower back

MOTIONS STRENGTHENED

Pushing, throwing, serving motions

TECHNIQUE

- Support yourself on a bench with one knee and one arm. Your back should be straight and parallel to the floor.
- Contract your abdominal muscles to stabilize your trunk.
- Grasp the weight with your hand in a neutral position like your are holding a candle or a glass of water. Pull the weight up so your upper arm is parallel to your body and the floor. Keep your upper arm stationary and next to your torso. Your lower arm should be perpendicular to the floor.
- Slowly press the weight back until your arm is fully extended. Your arm should be parallel to the floor with the weight behind your hip.
- Slowly allow the weight to drop back down to the starting position. Keep your upper arm stationary and next to your torso.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Exhale on the upward portions and inhale on the downward portion.
- Do not arch your back. Keep your abdominal muscles contracted and your back flat and straight.
- Do not lock your elbows at any time.
- Concentrate on keeping your upper arms stationary.
- Control the weight throughout the exercise.
- Keep your upper body supported by your arm at all times.

BENT OVER ROW

This exercise can be performed using dumbbells, cable machine or resistance bands

MUSCLES STRENGTHENED

- Primary: Latissimus dorsi, posterior deltoid
- Secondary: Rhomboid, Biceps, Trapezius

PARTS OF BODY STRENGTHENED

- Primary: Mid back, back of shoulder
- Secondary: Upper back, front of upper arm

TECHNIQUE

- Support yourself on a bench with one knee and one arm. Your back should be straight and parallel to the floor
- Contract your abdominal muscles to stabilize your trunk
- Grasp the weight with your hand in a neutral position like your are holding a candle or a glass of water. Your arm should be fully extended, with the weight on the floor. Slowly pull the weight straight up until it is approximately chest level. Keep your elbow close to your body.
- Slowly extend your arm and allow the weight to return to the floor. Control the weight all the way down.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Exhale on the upward portions and inhale on the downward portion.
- Do not arch your back. Keep your abdominal muscles contracted and your back flat and straight.
- Do not lock your elbows at any time.
- Concentrate on pulling with the latissimus dorsi muscles of your back. You should feel as if you are contracting your shoulder blade.
- Control the weight throughout the exercise.
- Keep your upper body supported by your arm at all times.

LEG EXTENSION

This exercise can be performed using single or multi-station machine or resistance bands.

MUSCLES STRENGTHENED

- Primary: Vastus medialis, Vastus imtermedius, Vastus Lateralis, Rectus femoris.
- Secondary:

PARTS OF BODY STRENGTHENED

- Primary: Front of upper leg
- Secondary:

MOTIONS STRENGTHENED

Jumping, running downhill, decelerating and changing direction, running, walking, skiing.

TECHNIQUE

- Sit on the bench. Place ankles under roller pads. Knees should be aligned with the rotational axis of the machine. Hold onto handles or the side of the bench. Keep your torso straight and erect.
- Contract your abdominal muscles to stabilize your trunk and spine.
- Slowly extend the legs fully at the knees. Do not lock the knees. Keep you torso straight and in contact with the back of the bench. Do not arch your back.
- Slowly lower your legs until they are flexed at approximately 120 degrees. It is not necessary to let your legs flex back to a normal sitting position. At this position there is excessive stress placed on the knees when performing leg extensions. If you allow the legs to flex to approximately half way between full extension and a normal sitting position you will perform a safe and effective exercise.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Exhale on the upward portions and inhale on the downward portion.
- Do not arch your back.
- Control the weight throughout the exercise.
- On the downward phase, only lower your legs half way to a normal sitting position.

LEG CURLS

This exercise can be performed using single or multi-station machine or resistance bands.

MUSCLES STRENGTHENED

- Primary: Semitendinosus, Semimembranosus, Biceps femoris(Hamstrings)
- Secondary:

PARTS OF BODY STRENGTHENED

- Primary: Back of upper leg
- Secondary:

MOTIONS STRENGTHENED

Running, jumping.

TECHNIQUE

- Lie face down on the bench. The knees should be placed just below the kneepads. Position your ankles under the roller pads. Align your knees with the rotational axis of the machine. Hold onto the handles or side of the bench. Keep your hips and upper body flat against the bench.
- Contract your abdominal muscles to stabilize your trunk and spine.
- Slowly flex your legs at the knees. Pull your heels to as close to your buttocks as possible. Make sure you keep your hips flat on the bench. Do not allow your back to arch.
- Slowly lower your legs until they are back at the starting position.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Exhale on the upward portions and inhale on the downward portion.
- Do not arch your back. Keep your hips flat against the bench throughout the exercise.
- Control the weight throughout the exercise.

SEATED DUMBBELL CALF RAISE

This exercise can be performed using dumbbells

MUSCLES STRENGTHENED

- Primary: Gastrocnemius, Soleus (Emphasis on soleus)
- Secondary:

PARTS OF BODY STRENGTHENED

- Primary: Back of lower leg.
- Secondary:

MOTIONS STRENGTHENED

Running, jumping, walking, skipping.

TECHNIQUE

- Sit on a bench with your feet flat on the floor. Place a dumbbell on your knee, balanced with your hand. Extend your foot so that your heel is off the floor and your foot is on its toes. Slowly lower your heel back onto the floor.
-
- Repeat this exercise with the other foot.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Exhale on the upward portions and inhale on the downward portion.
-
- Control the weight throughout the exercise.

CORE STABILIZATION

This is a body weight exercise.

MUSCLES STRENGTHENED

- Primary: All muscles that attach to the pelvis
- Secondary:

PARTS OF BODY STRENGTHENED

- Primary: Core muscles
- Secondary:

MOTIONS STRENGTHENED

Stabilization of the trunk during all exercises

TECHNIQUE

- Lie face down on a mat. Support your weight with your feet and forearms. Tuck your pelvis so that your hips are pressed forward and your body is straight. Hold this position.
- Holding the above position, lift your left arm and hold it above your head. Return the left arm to the support position and lift your right arm above your head. Return the right arm to the support position and lift your left foot off of the mat. Return the left foot to the mat and lift the right foot.
- Now comes the fun part. Return the right foot to the mat. Now lift your right arm and left foot at the same time. You should now be supporting your body with your left forearm and your right foot. Now return the right arm and left foot to the mat and lift your left arm and right foot.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise.
- Use a controlled curling motion throughout the exercise.
- Be sure to keep your hips tightly tucked during this exercise. Do not allow your lower back to arch or curl.

Running Specific Strength Exercises

BENCH STEP UPS

This is a body weight exercise. Advanced athletes may add additional resistance by holding dumbbells.

MUSCLES STRENGTHENED

- Primary: Semitendinosus, Semimembranosus, Biceps femoris (Hamstrings), Gluteus maximus, Quadriceps muscles.

PARTS OF BODY STRENGTHENED

- Primary: Front and back of upper leg, buttocks

MOTIONS STRENGTHENED

Running, jumping, walking, skiing.

TECHNIQUE

- This exercise may be performed with body weight only or with additional resistance by holding a dumbbell in each hand.
- Stand in an upright position. If you are holding dumbbells, they should be held at your sides with a neutral grip.
- Contract your abdominal muscles to stabilize your trunk and spine.
- Stand directly in front of a step bench that is 18 to 24 inches high. Place one foot (lead foot) flat on the bench. With most of your weight on the heel of the lead foot, forcefully push off with the lead leg and assume a standing position with both feet on the bench. Repeat for the desired number of repetitions
- Slowly remove the trailing leg from the bench and lower yourself to the original starting position.
- Repeat this exercise using the other leg as the lead leg.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Inhale on the downward portions and exhale on the upward portion.
- Keep your back in a vertical position.
- Do not allow the knee of the forward leg to extend in front of the foot.
- Do not lock your knees at any time during this exercise.

BENCH STEP DOWNS

This is a body weight exercise. Advanced athletes may add additional resistance by holding dumbbells.

MUSCLES STRENGTHENED

- Primary: Semitendinosus, Semimembranosus, Biceps femoris (Hamstrings), Gluteus maximus, Quadriceps muscles.
- Secondary:

PARTS OF BODY STRENGTHENED

- Primary: Front and back of upper leg, buttocks
- Secondary:

MOTIONS STRENGTHENED

Running, jumping, walking, skiing.

TECHNIQUE

- This exercise may be performed with body weight only or with additional resistance by holding a dumbbell in each hand.
- Stand on a bench that is 18 to 24 inches high, in an upright position. If you are holding dumbbells, they should be held at your sides with a neutral grip.
- Contract your abdominal muscles to stabilize your trunk and spine.
- Keeping most of your weight on one foot (lead foot), slowly remove the trailing foot from the bench and step down to the floor. Keep the lead foot flat on the bench. Step down very slowly and with full control. Keep your back vertical. Step down until your trailing foot is flat on the floor.
- Forcefully push off with the trailing foot (the foot on the floor) and reassume the original standing position on the bench. Repeat for the desired number of repetitions
- Repeat this exercise using the other leg as the lead leg.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Exhale on the downward portions and inhale on the upward portion.
- Keep your back in a vertical position.
- Do not allow the knee of the forward leg to extend in front of the foot.
- Do not lock your knees at any time during this exercise.
- Perform the downward portion of this exercise very slowly and with full control.

ONE-LEG SQUATS

This is a body weight exercise. Advanced athletes may add additional resistance by holding dumbbells.

MUSCLES STRENGTHENED

- Primary: Semitendinosus, Semimembranosus, Biceps femoris (Hamstrings), Gluteus maximus, Quadriceps muscles.
- Secondary:

PARTS OF BODY STRENGTHENED

- Primary: Front and back of upper leg, buttocks
- Secondary:

TECHNIQUE

- This exercise may be performed with body weight only or with additional resistance by holding a dumbbell in each hand.
- Stand in an upright position. If you are holding dumbbells, they should be held at your sides with a neutral grip.
- Contract your abdominal muscles to stabilize your trunk and spine.
- Place one foot (rear foot) behind you on a bench that is 6 to 12 inches high. Your other foot (forward foot) should be flat on the floor and directly under you. Bend your forward knee until it is at approximately a 90-degree angle. Do not let your knee extend in front of your foot. Slowly straighten your forward leg and return to the starting position.
- Repeat this exercise using the other leg as the lead leg.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Inhale on the downward portions and exhale on the upward portion.
- Keep your back in a vertical position.
- Do not allow the knee of the forward leg to extend in front of the foot.

STRIDE STEP UPS

This is a body weight exercise. Advanced athletes may add additional resistance by holding dumbbells.

MUSCLES STRENGTHENED

- Primary: Semitendinosus, Semimembranosus, Biceps femoris (Hamstrings), Gluteus maximus, Quadriceps muscles.
- Secondary:

PARTS OF BODY STRENGTHENED

Primary: Front and back of upper leg, buttocks
Secondary:

TECHNIQUE

- This exercise may be performed with body weight only or with additional resistance by holding a dumbbell in each hand.
- Stand on a bench that is 18 to 24 inches high, in an upright position. If you are holding dumbbells, they should be held at your sides with a neutral grip.
- Contract your abdominal muscles to stabilize your trunk and spine.
- Stand with your weight on one foot (lead foot). The other foot (trailing foot) should be held off the bench and slightly behind your body. Keeping the weight towards the heel of your lead foot (foot on the bench), slowly step down until your trailing foot just brushes the floor. Keep your weight on your lead foot (the one on the bench). Forcefully push off with your lead foot (the one on the bench)and drive the knee of your trailing leg upward, as in a running stride. Repeat for the desired number of reps.
- Repeat this exercise using the other leg as the lead leg.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Exhale on the downward portions and inhale on the upward portion.
- Keep your back in a vertical position.
- Do not allow the knee of the forward leg to extend in front of the foot.

Plyometric Exercises

RUNNING BOUND

This is a high intensity plyometric exercise that is suitable only for intermediate to advanced athletes.

MUSCLES STRENGTHENED

- Primary: Semitendinosus, Semimembranosus, Biceps femoris (Hamstrings), Gluteus maximus, Quadriceps muscles.
- Secondary:

PARTS OF BODY STRENGTHENED

- Primary: Front and back of upper leg, buttocks
- Secondary:

MOTIONS STRENGTHENED

Running, jumping

TECHNIQUE

- Begin by performing an easy run. Push off explosively with your left leg and drive your right knee up and out. Concentrate on driving the knee forward. Strive for maximum distance with each bound. Avoid vertical movement and stay low to the ground.
- Upon landing on the right foot, push off explosively with the right foot, driving the left knee up and out. Repeat this sequence throughout the drill. Remember to try to maximize distance and minimize time on the ground. Try to feel light on your feet. Repeat for 50 to 100 meters.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise
- Do not lock your knees at any time during this exercise.
- Do not attempt this exercise if you're not conditioned for high intensity activities.

ONE-LEG HOP IN PLACE

This is a body weight exercise. Advanced athletes may add additional resistance by holding dumbbells.

MUSCLES STRENGTHENED

- Primary: Semitendinosus, Semimembranosus, Biceps femoris (Hamstrings), Gluteus maximus, Quadriceps muscles.
- Secondary:

PARTS OF BODY STRENGTHENED

- Primary: Front and back of upper leg, buttocks
- Secondary:

TECHNIQUE

- This exercise may be performed with body weight only or with additional resistance by holding a dumbbell in each hand.
- Stand in an upright position. If you are holding dumbbells, they should be held at your sides with a neutral grip.
- Contract your abdominal muscles to stabilize your trunk and spine.
- Place one foot (rear foot) behind you on a bench that is 6 to 12 inches high. Your other foot (forward foot) should be flat on the floor and directly under you. Bend your forward knee until it is at approximately a 90-degree angle. Do not let your knee extend in front of your foot. Hop up and down on your forward leg as quickly as your can. Most of the motion should be at your ankle. The rear foot should remain stationary and in contact with the bench. Hop for 15 to 30 seconds.
- Slowly straighten your forward leg and return to the starting position. Repeat this exercise using the other leg as the lead leg.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Inhale on the downward portions and exhale on the upward portion.
- Keep your back in a vertical position.
- Do not allow the knee of the forward leg to extend in front of the foot.

SINGLE LEG FORWARD HOP

This is a high intensity plyometric exercise that is suitable only for intermediate to advanced athletes.

MUSCLES STRENGTHENED

- Primary: Semitendinosus, Semimembranosus, Biceps femoris (Hamstrings), Gluteus maximus, Quadriceps muscles.
- Secondary: Adductors, abductors

PARTS OF BODY STRENGTHENED

- Primary: Front and back of upper leg, buttocks
- Secondary:

MOTIONS STRENGTHENED

Running, jumping, skiing.

TECHNIQUE

- Stand on one foot with the other foot held free and behind your body.
- Quickly drop your body 10 to 12 inches by flexing your knee and rapidly explode upward and forward. Swing your arms forcefully upwards.
- Land on the same leg and immediately repeat the exercise.
- Repeat with the other leg.
- Repeat for the desired number of repetitions.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Inhale on the downward portions and exhale on the upward portion.
- Do not allow your knees to extend in front of your toes.
- Do not lock your knees at any time during this exercise.
- Do not attempt this exercise if you're not conditioned for high intensity activities.

SINGLE LEG ZIG ZAG HOP

This is a high intensity plyometric exercise that is suitable only for intermediate to advanced athletes.

MUSCLES STRENGTHENED

- Primary: Semitendinosus, Semimembranosus, Biceps femoris (Hamstrings), Gluteus maximus, Quadriceps muscles.
- Secondary: Adductors, abductors

PARTS OF BODY STRENGTHENED

- Primary: Front and back of upper leg, buttocks
- Secondary:

MOTIONS STRENGTHENED

Running, jumping, skiing.

TECHNIQUE

- Stand on one foot with the other foot held free and behind your body.
- Quickly drop your body 10 to 12 inches by flexing your knee and rapidly explode upward, forward and to the side. Swing your arms forcefully upwards.
- Land on the opposite leg and immediately repeat the exercise with that leg, jumping forward and in the opposite direction in a zig zag pattern. Strive for maximum distance on each hop.
- Repeat for the desired number of repetitions or for a specific time or distance.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Inhale on the downward portions and exhale on the upward portion.
- Do not allow your knees to extend in front of your toes.
- Do not lock your knees at any time during this exercise.
- Do not attempt this exercise if you're not conditioned for high intensity activities.

SPLIT LUNGE JUMP

This is a high intensity plyometric exercise that is suitable only for intermediate to advanced athletes. You should become familiar with the lunge exercise before attempting this.

MUSCLES STRENGTHENED

- Primary: Semitendinosus, Semimembranosus, Biceps femoris (Hamstrings), Gluteus maximus, Quadriceps muscles.
- Secondary:

PARTS OF BODY STRENGTHENED

- Primary: Front and back of upper leg, buttocks
- Secondary:

TECHNIQUE

- Stand in an upright position. Assume a lunge stance with one leg bent at the knee and placed forward and the other leg behind your body.
- Contract your abdominal muscles to stabilize your trunk and spine.
- Lower your body about 8 to 10 inches and explosively jump off of your front leg, springing into the air. Reverse the position of your legs in the air. The forward leg should move to the back and the back leg to the front. Immediately repeat the exercise with the reversed leg position.
- Repeat for the desired number of repetitions.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Inhale on the downward portions and exhale on the upward portion.
- Keep your back in a vertical position.
- Do not allow the knee of the forward leg to extend in front of the foot.
- Do not lock your knees at any time during this exercise.
- Make sure you are familiar with the lunge exercise and do not attempt this exercise if your are not properly conditioned for high intensity activity.

DOUBLE LEG LATERAL HOP AND RUN

This is a high intensity plyometric exercise that is suitable only for intermediate to advanced athletes.

MUSCLES STRENGTHENED

- Primary: Semitendinosus, Semimembranosus, Biceps femoris (Hamstrings), Gluteus maximus, Quadriceps muscles.
-
- Secondary: Adductors, abductors

PARTS OF BODY STRENGTHENED

- Primary: Front and back of upper leg, buttocks
- Secondary:

MOTIONS STRENGTHENED

Running, jumping, skiing.

TECHNIQUE

- Stand in an upright position with your knees slightly bent and your feet about shoulder-width apart.
- Quickly drop your body 10 to 12 inches by flexing your knees and rapidly explode upward and to the side. Swing your arms forcefully upwards.
- Upon landing, immediately repeat the jump, but jump to the other side. Repeat this 10 times. After the 10th jump, sprint forward for 50 meters.
- Repeat for the desired number of repetitions.

THINGS TO WATCH OUT FOR

- Breath throughout the exercise. Inhale on the downward portions and exhale on the upward portion.
- Do not lock your knees at any time during this exercise.
- Do not attempt this exercise if you're not conditioned for high intensity activities.

4

Race Strategy

Lining Up

The proper etiquette to follow in lining up for road racing is to place yourself in a position in the starting pack that surrounds you with runners of equal ability. As a 4 hour 10 minute marathon runner, you will be in the top 40% of all runners in most races. That means that if everyone lines up correctly, you should be just in front of the middle of the starting packs. In most major marathons, you will be seeded into one of the corrals or starting areas in the front half of the starting grid. Because of the long distance of this race, it is not really critical that you maintain a front position at the start. You will have plenty of time to achieve your proper position in the pack, after the start. Is some ways it may be beneficial to allow other runners to start in front of you. Allowing other runners to take the burden of the lead can pay benefits later in the race.

Lining up correctly will help insure a safe and efficient start. Faster runners should line up in front. Slower runners should line up progressively further to the back.

The Start

At the start of the race, you will probably be tempted to start quickly. You will be fresh, strong and have a lot of adrenalin built up. Try to avoid that temptation. The most serious mistake most marathon runners make is starting off at too fast a pace. Hold back just a bit at the start. Holding back at the start will allow you to run strongly through the highly important middle portions of the race and you will be able to finish with a strong pace and kick.

After the first mile or so, the runners will all fall into their paces. Get into your rhythm and find your pace at this point. Run your race at your planned pace. Do not allow other runners to affect your pace at this point. Later in the race, there will be many opportunities to pass other runners that did not run a smart race.

Race Pacing

Proper pacing and race strategy are critical to the success of your marathon. If you run the first part of the race too fast you will pay a great price in the last miles. Your conditioning, course terrain, weather and race events will dictate correct strategy.

There are a number of possible pacing strategies. Each of these have their advantages and disadvantages. The proper strategy will depend upon your strengths and weaknesses; and the race and course conditions.

•**Even Pacing** - Maintaining the same pace per mile throughout the race. This strategy is favored by many athletes and results in very good performances. Many studies have shown that the top runners in most races tend to run both the first half and the second half of the race in nearly equal times.

•**Even Effort** - Maintaining the same perceived effort level throughout the race. This type of pacing is more appropriate for beginning runners. Even effort pacing will result in slowing throughout the race due to the perceived effort level rising as you fatigue. This type of pacing will allow you to finish comfortably, but will not result in optimal performance.

- **Negative Splits** - Running the second half of the race faster than the first. Many coaches favor negative splits, because the easier start will reserve strength and energy for a fast finish. This type of pacing can be very enjoyable because you will pass a lot of runners in the last half of the race. If the course is flat and conditions are good, it can also give very good results. This is not always the best strategy if the second half of the course is harder than the first. It can also become difficult to catch competitors that run stronger in the first half and open up a large lead.
- **Surging** - Changing your pace throughout the race, depending upon race and course conditions. Surging is a very useful strategy and if used properly can give excellent results in any race.
- **Front Running** - Starting strong and trying to hang on throughout the race. This is not recommended for most runners. The idea of this type of pacing is to open a large lead and then try to hang on for the remainder of the race. This will always lead to a lot of pain in the last half of the race and very seldom results in top performances. There are some runners that have a very efficient stride that can maintain a quality pace when very fatigued. This type of runner may have success with this type of pacing, but for most runners, this is a bad pacing strategy.
- **Strong Start/Middle Float** - Starting strong, then running at a quality, but relaxed pace in the middle and finishing strong. This is a modified type of front running. Using this strategy, a runner will start strong and create some separation from the other runners. This runners will then slow to a strong but relaxed pace and try to recover while maintaining a lead. Then when

partially recovered will finish strong. As with front running, only a runner that is able to handle a lot of pain and has a very efficient stride will have success with this strategy.

- **Middle Push/Strong Finish** - Starting at a relaxed pace, pushing hard in the middle miles and try to hang on for a strong finish. This is a very popular strategy that consistently results in top performances. Using this method, the runner will start with a relaxed pace in the early miles. In the middle of the race, the runner will pick up the pace to just over race pace and try to maintain this pace through to the finish. If you have the mental and physical strength to maintain that quality pace through to the finish, you will get very good results with this strategy.

Pacing Suggestions

I would suggest using a combination of even pacing and surging. You should hold back just a bit at the start. The main reason for this is to avoid a start that is too fast. If you run the first miles of the race at significantly faster than the pace you have trained for, you will suffer greatly during the last miles of the race. It is much better to run even pacing in a marathon. As in other races, you can use surging tactics when passing other runners, testing other runners, trying to discourage other runners or breaking from a pack. Do not try to maintain a surge for a long distance. The exception to this is when surging to the finish in the last mile or so of the race.

If your course has hills, use them to your advantage. On the uphills run strongly, but stay relaxed. Your pace will drop slightly on the uphills, but stay strong on the uphills. Do not allow your pace to drop dramatically. Take advantage of the downhill sections to recover. You can maintain race pace or even a faster pace on the downhills and still get in some recovery time. Do not lean back and fight the hill. Maintain a forward lean and use the hill to maintain your speed while decreasing you effort level.

Weather will play a major role in proper pacing. For most runners, high temperature means slower pacing. If you expect hot weather during your race, try to do a considerable amount of your training in similar temperatures. Extremely cold or wet weather can also cause your pace to be slower. If the race day temperatures are mild, you should be able to maintain a slightly faster pace.

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