

Workout Descriptions – Heart Rate Calculations

As you can see if you review the FM/HM schedules for those of you that are more experienced, that we have a lot of different runs that we do to improve your speed. I have given you a brief over view below of each type of workout that we do or that you can do as part of your speed workout routines. We do not do all of these but most we will do or will do portions of. One of the workouts that we talk a lot about through out the program for speed improvement is the Fartlek. Fartlek means, “Speed play”. That is to say we play with different speeds as part of the workout. Whenever we vary your speed during the run for short intervals, you are essentially doing a fartlek. For example, a common Fartlek that you will see in the schedule is done on Monday. It looks something like this:

25 seconds at MM pace with 1-minute recovery jog between...repeated 8-10 times. This is a pretty basic Fartlek. vary the speed from fast (MM/5K Race Pace) to a slow jog. The minute in between allows your heart rate to recover before doing the next fast segment. With this workout, we are building your aerobic capacity. That means we are getting your body to be more efficient with the limited amount of oxygen that you can take in and getting your muscles used to running oxygen lean. One of the reasons we emphasis doing core is that we want you to be able to maximize your lung capacity. The key to running any distance is having sufficient oxygen and training our body to use what we have not matter how much that is. If you run oxygen deficient you tire quickly. So, the more oxygen you can take in (lung capacity) the faster and/or further you can run before you tire. Doing core and doing the speed work as shown in the schedule helps you achieve speed and increase your lung capacity.

Some of the workouts we do and some that you can try on your own:

Endurance Workouts

While Endurance is the overriding theme behind endurance training, there are actually three distinct goals or purposes for endurance workouts. The first is to recovery from a previous workout or race. The second is to improve your endurance – the ability to run for longer and longer. And the third is to maintain your aerobic fitness level and maximize your aerobic capacity. Three distinct types of workouts consequently represent these goals: Recovery Jogs, Long Runs and Easy Runs. I will discuss each in detail so that as you plan for your scheduled run, you’ll know exactly how to train optimally for that particular workout.

Recovery Runs

A recovery run is just a slow jog. In fact, I usually list recovery runs as recovery jogs just to reinforce that the run is very slow. The correct pace is one and a half to two minutes slower than your estimated marathon race pace and your heart rate must stay below 65% of maximum (possibly reaching around 70% by the end of the run). (Note: Older, fit runners will likely have to maintain 70-80% of max heart rate on recovery runs.) Believe me, you’ll find it difficult to run this slow at first, but you must, if you want to improve and get more from your training. Keep the effort very, very light.

Recovery jogs should be used the day (or two) after a hard workout or race. We seem to get caught up in our normal pace or the pace of our training partners and end up running too fast on our recovery days (I’m guilty of this all the time). Slow down. Remember, the goal is simply to get the muscles warmed up, blood flowing to deliver essential rebuilding nutrients to the muscles and to work out the tightness that occurs from hard running. There is no other goal of a recovery jog. Therefore, these runs last only 15 minutes to one hour – the shorter the better.

Long Steady Runs

Long steady runs need no introduction because we include one every seven to 14-21 days in our training program(s). The purpose is simply time on your feet. Challenging your ability to keep running significantly improves your endurance and is the most important part of distance training. While there are debates on just how long and fast your long run should be, the general consensus is that you keep your heart rate around 70% of maximum. The appropriate pace is 30 seconds to two minutes slower (depending on temperature and humidity) than your estimated marathon race pace with the runs lasting at least an hour and up to four. They are slow runs with the challenge of simply running a steady pace for the entire duration of the run. Intervals can be used to keep your heart rate in the required zone (70-75% of Maximum). This will be based on the individuals and groups desires. The first few months we will set the intervals for each group and pace to ensure everyone is running at a pace that is not be too difficult to maintain for the distance for that day. Intervals (based on MM pace and recovery heart rate) are adjusted based on how quickly your heart rate drops when going from running to walking as your conditioning improves. The idea behind the long steady runs is to keep the effort easy and steady and resist the temptation to increase the pace just to get home sooner. Give the body time to really feel the stimulus of a long run. It will reward you with greater endurance adaptations that will serve you well in later training workouts and races.

If you are training for a half or a full marathon, then you'll also perform Fast Finish Long Runs. These are outlined in the training program and/or schedule and will come later in the training.

Easy Runs

The final true Endurance workout is the easy run. The majority of your training is likely to be comprised of easy runs and the purpose is to fully develop your aerobic fitness and then maintain it. The pace for easy runs can be as fast as 30 seconds slower than marathon race pace and as slow as one minute slower than marathon pace. Your heart rate is around 75% of maximum though it can reach 80% near the end of the run. Easy runs last anywhere between 15 minutes and an hour and a half. Again, one of the common mistakes we make is running our easy runs too fast. Keep them steady but don't get into a pace where your breathing becomes noticeably faster.

Medium Long Runs

At times, particularly with half-marathoners and marathoners, we'll include a mid-week medium long run. This endurance workout gives the body/mind another stimulus to get ready for the longer races. This run is very similar to the Long Steady Run and the heart rates and paces are the same. However, sometimes, we'll include some faster running within the Medium Long Run. You may find a Pace Change workout or a Pace Booster workout within the Medium Long Run. The details of each workout are given in your training program but in short, the Pace Change workout includes alternating a faster mile (~10K race pace) with a slower mile (~marathon race pace) for 6-8 miles. The Pace Booster workout involves a 4-6 mile portion of the Medium Long Run that is performed at your Steady State Run pace.

Stamina Workouts

Stamina workouts introduce steady, medium paced running into your program and mimic many common race distances of runners – half marathon, 10K and 5K. The goal is to develop your ability to run a steady pace for long periods of time. Specifically, you increase your lactate threshold pace which leads to faster race times. The challenge with each of the four types of Stamina workouts is to keep from running too fast. These are moderate efforts and running faster does little but shorten the amount of time that you are in the correct zone. It's much better with Stamina workouts to challenge your self to go longer at a given pace than faster.

Pace Booster/Steady-State Runs

Distance runners now seem to have only two speeds, slow and fast – nothing in between. But the steady-state run is one of the most beneficial types of workouts especially as you complete your base training and during the initial parts of your Stamina phase. The appropriate pace range for Steady-State runs is between your 30K and half-marathon race pace. Your heart rate will likely be between 83 and 87% of maximum and the runs should last at least 25 minutes and can go as long as an hour and 15 minutes.

These are pretty tough efforts not because of the pace but because of the duration of running so be prepared to increase your concentration to stay on pace and to take a good recovery day afterwards in order to reap the full benefits. Begin with shorter steady state run of 25 minutes at 30K race pace and build to one-hour runs at 30K pace with shorter (25- to 45-minute) steady state runs at half-marathon pace.

Unlike the Endurance workouts discussed above, Steady-state runs are the first workouts that require a warm-up. For all the remaining workouts, you should begin the run with 10 to 20 minutes at an easy pace. Following this warm-up (which may also include stretching and faster “strides”), you can proceed into the continuous Steady-State Run.

Tempo Runs

Tempo runs are slightly more intense than Steady-State Runs and are designed to increase your stamina. As the name suggests, you really improve your running tempo or rhythm with these workouts. They last between 15 and 30 minutes and are run between your 12K and half-marathon race pace. The greatest challenge with Tempo runs is to avoid running too fast. They are meant to be “comfortably hard” – don't push the pace. Your heart rate will likely be between 85 and 90% of max. Like the Steady-State Run, Tempo Runs are continuous efforts but you must begin them with a thorough warm-up.

Tempo Intervals

Tempo Intervals are slightly faster than tempo runs and are broken into two to four repeats with relatively short recovery jogs. The appropriate race paces for Tempo Intervals are 10K to 15K race pace should last between eight and fifteen minutes. Unlike the previous workouts, Tempo Intervals are the first workouts to allow for a recovery jog between hard efforts. In this case, you jog two to five minutes between each repeat then start the next one.

A Tempo Intervals workout that I've had particular success with is two (or three) times two miles at 10K race pace effort with three minute recovery jog between repeats. Following a thorough warm-up, these provide a great training stimulus to prepare you for an upcoming 10K race. The effort required, the pace judgment and the mental discomfort all help immensely when race time comes.

Cruise Intervals

The Cruise Interval workout was popularized by the running coach, Jack Daniels (not to be confused with the alcohol founder). They like the other Stamina workouts are meant to improve your stamina. Cruise Intervals are like shorter and slightly more intense Tempo Intervals. They last three to eight minutes and the pace is between 8K and 12K. Like Tempo Intervals, they are followed by short recovery intervals (30 seconds to 2 minutes). You will probably find that it's easy to run too fast on these. Keep it under control and work on a smooth, fast rhythm. Control in training is key to improvement.

Progression Runs

The final stamina workout is a progression run. We prescribe three main types of progression runs and they are detailed very well in the Progression Run article on the Craig McMillian website for those of you who want more information.

Speed Workouts / Aerobic Capacity (AC) Intervals

Here's where we get to the fast stuff. These workouts are what most of us think of as "speed work". They last between 400m and 2000m and are run between MM and 8K race pace. The goal here is to spend time at your maximum aerobic capacity (or VO2 max). Because the pace is faster, you must take a recovery jog of about half the distance (or jog for the same duration of the faster running) of the repeat. So if you run a 1200m repeat, you would jog for about 600m to recover. These workouts allow you to maintain your speed over a longer period of time.

Sprint Workouts

The final workouts are Sprint Workouts. These help your top-end speed and consolidate your stride and form.

Anaerobic Capacity Intervals

Anaerobic Capacity Intervals comprise the first workout. Like the Speed Workout described above they are repeated hard efforts with recovery jogs in between. They last only 100m to 400m and are run at about your mile race pace effort with very long recovery intervals. It's usually recommended that you take two to five times the duration of the fast running as a recovery jog before starting the next hard effort, which is usually equal one to two times the distance of the repeat. For example, if you run repeat 200m, then you would jog for 200 to 400m before beginning the next one.

The goal is to flood the muscles with lactic acid and then let them recover. Your leg strength and ability to tolerate lactic acid build-up will improve, allowing you to sprint longer.

Strides

You're probably familiar with "Strides" though you may call them wind sprints, pickups, striders or stride outs. They're not unlike the fast accelerations that you probably do right before a race. Strides work to improve your sprinting technique by teaching the legs to turn over quickly. It's really the neuromuscular system that we're trying to develop here which is why they are shorter than Anaerobic Capacity Intervals. They last only 50-200m (or 15 to 30 seconds) because unlike the Anaerobic Capacity Intervals, we don't want lactic acid to build up during each stride. This inhibits the nervous system and interferes with the neuromuscular adaptations that we want. Accordingly, after each stride, you must jog easily for a minimum of 30 seconds and up to a minute and a half to make sure the muscles are ready for the next one. Not allowing for sufficient recovery after each stride is a common mistake. Take advantage of the longer recovery. It will allow you to put more effort into each stride, which really helps develop your speed. As you might imagine, the pace for strides is very fast – 800m to mile race pace BUT you must begin them slowly (5K pace) and get faster and faster with each stride - building your speed within each stride and from one stride to the next across the workout. Note that this is not all-out sprinting. Run fast but always stay under control. These are quick efforts where you practice good form. You'll be amazed at how much your finishing kick improves with these workouts. We also recommend that you do some strides on flat ground, some on gradual uphill and some on gradual downhill to improve your ability to run fast no matter what the finishing straight of the race is like. You can incorporate some strides or "pick-ups" during the middle of your run or at the end. To perform, run fast for 15 to 25 seconds then jog easily for 30 seconds to a minute and a half before beginning the next one. Begin with four strides and build up to ten to 20.

Hill Repeats

It's rare that you find a great distance runner who didn't get fast by training on hills. Kenyans and Ethiopians all train on hills. I find that hill training is one of the best workouts that you can do. It provides great stimulus to the cardiorespiratory system, develops your ability to tolerate lactic acid build up, strengthens the legs, practices leg turnover that matches common race distances like the 5K and 10K yet avoids the pounding that is associated with traditional speed work. When hills are encountered during races, they pose no threat to you and you can run them better and more efficiently than other runners, both uphill and downhill.

To perform a hill workout, find a hill with a medium slope (Bailey Bridge for example) that takes between 45 seconds and one minute and 20 seconds to ascend. Run up at an effort equivalent to your MM to 10K race pace *effort*. Focus on good form with powerful push off and strong arm swing. Jog down the hill slowly to recover. You can also practice your downhill running technique by running down the hill occasionally at MM-30 seconds to 5K race pace. Keep your body under control and add these descents in gradually as you will probably be sore afterwards.

At times, I also recommend Steep Hill Repeats that aren't as long (only 15-30 seconds) but the hill is much steeper. These really develop power in the legs. I also recommend that you run down the hill backwards and side ways to stretch the calf and hip flexor muscles and keep your legs loose.

While the above Hill Repeats outline the common type of hill workout, I also recommend running on hilly courses often, especially during your base and stamina phases of training. The only place that I know of to do this is to run Hershey Park, which would be a field trip for us.

Straights & Curves (S&C)

The S&C workout is designed to help develop your stride rate (leg turnover) and to work on your running form. To perform, go to a track and jog the curves and stride the straights. Begin the strides at a medium speed and get faster and faster with each stride.

In's & Out's (I&O)

The I&O workout is just like the S&C workout except that the strides and jogs are longer (200m). At the track, you will stride for half a lap and jog for half a lap. Same effort and form as the S&C workout but the I&O takes it to a new level.

Warm-up/Cool-down

Preface each workout with a thorough warm-up to prepare the body and mind for the upcoming work. 10-30 minutes of easy jogging plus stretching followed by a few strides building to slightly faster than the pace to be run in the workout is ideal.

End each workout with a cool-down to return it gently to normal conditions. A slow, 10-30-minute jog followed by stretching is ideal. Don't forget to stretch, as this is the best time to create greater flexibility.

Heart Rate (HR)

Those of you that want to improve your physical endurance, cardiovascular health, and train at an optimal pace should begin to understand and train within your heart rate zones. I recommend that all runners have a HR monitor. Almost all the new watches have the ability to have a HR monitor included. The most important aspect of understanding heart zones is to know your maximum heart rate (Max-HR). There are tests that can be done by professionals to determine your maximum heart rate and formulas that can be used as well that are age based. The tests can be accurate and are far better than any of the formulas that I have found. Other ways can be used such as hard workouts and the like. I would say research this on the Internet and decide for yourself how you want to determine your Max-HR. When you use your HR monitor you will begin to understand your body and HR and how each work out affects your HR.

The thing to remember is that we are all different so if you have a Max-HR of 210 and you are the same age as your friend who's Max-HR is 180; it does not mean that your friend is more fit than you are. It only says that he/she is different than you are. Once you find your Max-HR, you will need to also find your resting HR (RHR). This is taken just before you get out of bed in the morning. I try to take it through out the night wearing my HR monitor and I take the lowest value that I see. Again, this will be different for everyone. With these two pieces of information (Max-HR & RHR) you can calculate your training zones, which I have provided below. To determine the best intervals to run on your long runs, you need to determine your zones and then determine how long it takes your HR to drop within that zone when transitioning from running to walking in zone 3. The best way to determine this is to chart your HR during your runs and observe how much your HR drops when you start and end your walk. If after looking at your HR information you see that on average it takes only 30 seconds for your HR to drop at a point about 2/3 the way through your run, your walking interval needs to be 30 seconds. On the other hand, if it is taking more than a minute for your HR to drop to the lower end of your zone 3, then reduce the run portion of your run by at least 1 minute and review the data again. The goal is to find that point where you are staying in your zone 3 for at least 2/3 of a long run at your predicted or assigned pace.

HR Calculations:

Reserve HR (ReHR)= (Max-HR – RHR)

Zone 3: 65-75%

ReHR*65% + RHR

ReHR*75% + RHR

Zone 4: 75 – 85%

ReHR*75% + RHR

ReHR*85% + RHR

Zone 5: 85 – 90%

ReHR*85% + RHR

ReHR*90% + RHR

Example:

My Max-HR is 186

My RHR is 39

My Reserve HR (ReHR)= (186 – 39) = 147

Zone 3: 65-75%

147*65% + 39 = 135

147*75% + 39 = 149

Zone 4: 75 – 85%

147*75% + 39 = 149

147*85% + 39 = 164

Zone 5: 85 – 90%

147*85% + 39 = 164

147*90% + 39 = 171