Run To Footstock Manual

Pete McBreen

2019-01-09

Contents

Run To Footstock Manual

The *Run To Footstock* Running Clinic was designed as a *structured training environment* with multiple run leaders to allow for the differing fitness and speed levels in the clinic runners. Through an 11 week progressive program, the clinic provides a gentle build up to the race. With three group training sessions per week, the clinic makes it possible for you to do all of your training runs in the lead-up to the race in a supportive group environment.

0.1 Clinic Training Principles

- Aim of all training is to be fit for the next session – improving at running requires that you train, and you cannot train when you are too tired to do the next session. So finish each session knowing that you could have done a bit more, that way you will be rested and recovered for the next session.
- Train easy so you are not stiff and sore the next day – a good sign that you are training too hard is being stiff and sore the next day. You know what your body is capable of, so do not try to raise your training to a whole new level overnight. Each session can only be a little bit more work than the previous to give your muscles, tendons and bones time to adapt.
- Occasional heavy breathing is good for you – most of the time you want to keep your breathing in the easy to moderate range, but sometimes you need to push your breathing to the upper end of your range to let your body know that occasionally you want to play.
- Strength before speed – fast running asks a lot of your body, so be nice, build up strength first and then when you are ready allow yourself to go fast. Remember that muscles build strength quickly, tendons take longer to get stronger, and bones are the slowest to respond to training, so allow enough time for your whole body to get stronger, not just your muscles.
- Practice running at many different paces – running is a learned skill, and part of this is learning what it feels like to run at a wide variety of paces, from *I could walk faster*, to an easy jog, to a conversational run, to comfortably hard and eventually all the way up to *I might make it to the next lamp post at this pace*. Each pace has a subtly different feel and your body will move slightly different for each one, and all paces play an important part of a running training program.

- Never race in training, save it for races – everyone has a competitive streak, but hold yours in check during training. Race day is the day to let it all hang out, knowing that you have tapered before the race and will have a gentle recovery period to ease you back into training after the race. Push too hard in one session and you will have to go easy on the next session, which means you will not get as much benefit from the session. Do that too often and the people you beat in training will beat you come race day.
- Consistent running makes it easier – as a beginner you need to run at least twice a week in order to make any progress. Your body responds to the stress of a training session by becoming a bit stronger, but in the time between sessions it forgets it needs to be stronger. After about three or four days, your body starts to de-train, so to improve you need to train more frequently than that. When first starting out, training three times/week works well, enough training stress so you improve, but not too much stress so that you have time to recover between the sessions. After the clinic you may choose to train more frequently, but for these eleven weeks, stick to training three days/week.
- Progressive training gets you fitter – if you do the same training every session, your fitness will soon reach a plateau as your body responds to that level of stress. The key to getting fitter is to gently, but persistently increase the workload in your training sessions, so that your body is always responding to the increasing stress, and in the rest between the sessions, rebuilding stronger and fitter. You have to be careful with progression to ensure that your body is building up in response to the added stress, not breaking down.
- Remember to play on the hills – hills are everywhere, so you might as well learn to enjoy them. Whenever you get to a hill, remember to smile, that way you will tell yourself that the hill is going to be fun, and eventually your body will start to believe you. Hills are great for training because they increase the workload without forcing you to run too fast, so you get a good strength workout with heavy breathing thrown in for good measure.
- If you are not enjoying running you are doing it wrong – running should not hurt or be painful, if it is, listen to your body and figure out what is wrong. The most common thing mistake in training is to go too fast, which is why you need to stick with your run leads during the clinic sessions, especially during the warm up and cool down part of the sessions.

Chapter 1

Introduction

Welcome to the *Run To Footstock Clinic* which runs for eleven weeks leading up to race day.

1.1 Group Clinic, Individual Responses

Depending on how well you chose your parents, you will either respond to training quickly or slowly, and you will respond to different types of training differently as well. Over the eleven weeks of the clinic you will improve, even if sometimes it seems like you are going backwards compared to the other people in the clinic. Your progress is not going to be smooth and linear, so expect that some weeks you will feel good and other weeks you will have to remind yourself why you want to run. This is a normal part of the process of training, you just need to keep training regularly and enjoy the process.

Regardless of how much you improve, the eleven weeks of the clinic are just the start of the process. Most runners discover that their fitness and times will improve with regular, progressive training for up to ten years. Most of the improvement will come in the first few years of training, after that the improvements will come more incrementally, but for now, just focus on the next eleven weeks.

Initially the group will do exactly the same sessions, but that will change as the weeks progress. The clinic is organized with multiple *Run Leads* who will run with you in smaller groups of similar abilities. The role of the Run Leads is to encourage you and to answer any questions you have, as well as remember the running routes so that nobody gets lost.

1.2 Consistent Training

This clinic has three sessions per week, (Wednesday evenings, Saturday Mornings and Monday evenings) so please organize your life to make as many of these sessions

as you can. Unlike exams, you cannot cram all your training in the evening before a race. Many people have tried this and we can safely say that it does not work. This clinic is eleven weeks long because it needs to be eleven weeks, You want this to be a gentle build up so that you can enjoy the process.

If you cannot make any sessions, the club has runs on the days after each of the clinic sessions, and you are welcome to participate in those sessions. Those club runs are not ideal for you as it will mean that you have less recovery time to the next clinic session, but it is much better than having to miss a session.

1.3 This is NOT a Boot Camp

If you ever hear the phrase *No Pain, No Gain*, please laugh at the speaker. The focus of any good program is *Train, Don't Strain*, a phrase that has been attributed to Arthur Lydiard, a New Zealand distance running coach, who revolutionized training in the 1960's and 1970's. The idea behind all training is to work within your current limits, in a way that causes your body to adapt to the increasing workload and become stronger and fitter.

About the only thing boot camps are good for is for making you sore and stiff the next day. When you are in your early twenties, your body might be resilient enough to adapt to the type of overload experienced in boot camps. The boot camp phenomenon relies on training that works for people whose bodies are what is called *fast responders*, who rapidly adapt to increased stress. After a few days or weeks of barely being able to move after the boot camp session, everyone else drops out of the boot camp.

That is not the way this clinic works.

During the clinic, the *run leads* will work with you to make sure that you are not working too hard. Yes, they are here to encourage you, but in the first few weeks it might seem like they are holding you back. This is intentional. Like most of us, either when first getting into running, or returning to running after a break of weeks, months or years, you will have an incorrect mental picture of what you are able to do. Anyone can run hard and fast for six seconds, most people can run quite quickly for twenty to thirty seconds, but any running beyond that time is going to be limited by your heart and lung fitness, your *aerobic* fitness.

1.4 Easy Running

Our first run is going to start off *very slowly*, you will feel that you could walk faster, and that will probably be true. Please stay with the run leads and do not try to go any faster because we need you to learn the *Recovery Jog* pace. This is slow, relaxed running at walking pace, a pace we will need much later on in the clinic after we have done one of our *Occasional Heavy Breathing* sessions. While you are trying to get your breathing back to normal you will need to do a Recovery Jog, because strange as it may seem, you will recover faster doing that than by walking.

The reason is that when you are running, your leg muscles are assisting your heart in keeping your blood flowing, thus aiding recovery.

All your runs are going to start off with easy running as part of your *Warm Up*, and finish off with some easy running as part of your *Cool Down*. The purpose of the warm up is to ease into running gently and to begin to feel how your body is responding – are you bouncing along just aching to get started, or are you aching and dreading having to move? Sometimes you will start off feeling sluggish but as the warm up progresses you start to feel better, other times the feeling will not go away and that is a sign to take the current session really easy.

Another pace that we will use a lot of is a *Conversational Pace*, where you can easily talk to the person running with you without having to resort to really short sentences. Over the course of the clinic we will build up the duration of this conversational running to at least forty minutes for those of you targeting the 5K Footstock race and at least seventy minutes for those of you targeting the 10K Footstock race. The idea being that before you can comfortably try to race a distance, you need at least to be able to run for an equivalent or longer time at an easy pace.

> Note. This clinic does not use the Run-Walk approach to running. We discovered over time that when trying that approach, beginners run faster than their body is ready for and then walk so slowly that the training effect of the run is lost. The effect of trying to run faster than your body is able to handle typically results in injury, often injuries that are very slow to heal - knees, ankles and tendons. The Run-Walk method can be successful if everyone in the group is able to control their pace while running, and when running solo, but for the purposes of this clinic we have found it easier to control the pace by requesting continuous running from the start.

1.5 No Extra Training During Clinic

We do not suggest that you do any extra training beyond the clinic unless you have already been doing that training for at least six months. Just because you start feeling fitter and stronger during the clinic, now is not the right time to add aerobics to your daily routine. If however you have been doing aerobics, yoga, weight training, etc. for at least six months, then keep at those. Participating in this running clinic means that you need to allow sufficient recovery time between the running sessions to allow your body to get stronger, and filling the rest days with extra work that you are not already doing will prevent you from benefiting from the running sessions.

1.6 Structure of Clinic

During the Wednesday and Monday evening sessions we will initially focus on strengthening work, and later on will start to practice running at your planned race pace.

The Saturday morning run will be a longer, easy run when you will run slower than your planned race pace. If you are planning on running the 5K race, your long run should get up near to 7K before the end of the clinic. For those of you planning on running the 10K, your long run should get up near to 13K before the end of the clinic. You can get away with doing less distance for your long runs, but you will be able to race better if you are used to running longer.

1.7 After The Clinic

The eleven weeks of the clinic are just about enough to get you to the starting line fit enough to enjoy the race. As long as you train consistently, your fitness levels and racing times will improve quite dramatically for the first few years of running. Most runners record their best times 8 to 12 years after starting to train, initially the improvements come rapidly, but incremental improvements will occur for many years.

The same structure to your training can be applied after the clinic, and you will be able to train more frequently and do other cross training.

Chapter 2

The Clinic

The clinic calls for you to run three times per week. Twice a week you will do running drills[1] followed by strength or speed sessions. Once per week you will do a continuous run. The bulk of the training you will do is relatively easy running where you are breathing comfortably, but during the strength and speed sessions there will be occasional heavy breathing. Please arrive for all sessions dressed ready to run, the sessions will only be called off if it is stupid cold (below -20C) or there is an active thunderstorm in the area (the concern is hail which is painful to run in, not lightning strikes).

2.1 Different Groups, Different Speeds

The clinic is organized so that you will run in small groups, each lead by a different run lead. All of the run leads have either been through the clinic or have been running for a while so they know what to expect and will be able to answer many of your questions. Initially you will be allocated into different groups based on the training that you have been doing over the past couple of months, using the following rough categories:

- Fresh off the couch
- Fresh off the couch but are regularly walking three times/week
- Regular walking and some cardio exercise
- Some short runs each week
- Regularly running three times/week

This classification is a guide to how strong the tendons and bones are likely to be in your feet, ankles and knees. If you are regularly on your feet and moving about, then your legs will be stronger and more resilient, so it will be safe for you to go further and faster in the sessions. If however you are fresh off the couch then you will need to limit the distances you cover in the first half of the clinic while your tendons and bones get stronger.

[1] The running drills are explained in detail in Chapter 6, Running Form Drills.

If you are not quite sure of which group best describes your current activity level, pick the lower activity level group. The groupings are very flexible, so if you respond well to the training sessions, it is easy to move up to the next group. You do not want to end up running too far one day and making your joints or tendons sore, as that could set your progress back by several weeks.

2.2 Choosing Your Race Distance, 5K or 10K

Our normal recommendation is that if you are not currently doing some running, choose the 5K race. Only choose the 10K race if you are currently running at least semi-regularly and spend a lot of time on your feet. It is much better to race the 5K quickly and finish thinking you could have done the 10K than struggle through the 10K wishing you had signed up for the 5K.

> Please do not think that the 5K is any less of a race than the 10K. If anything it is harder to get a fast time on a 5K because you have less time to recover from any pacing mistakes in the 5K. If you go out too fast in the 10K you can ease off for a few K and then get back down to your correct pace. If you do the same thing in the 5K you basically only have the last K that you can run at the correct pace.

The training you will do in the clinic is roughly the same for both races, but if you are planning on doing the 10K your long runs will be further and there will be more distance to cover in the strength and speed sessions. If half way through the clinic you discover you are responding well to the training then you can choose to move up from the 5K to the 10K race, but after that you should not because your legs will not be used to the longer distances on the long runs. You can choose to step down to the 5K race at any point during the clinic, and please do so if you discover that the longer runs are not as enjoyable as you thought they would be.

2.3 Getting Fit Slowly

You are not going to get fit instantly. Best performances typically occur 8 to 12 years after start training. So you need to enjoy the process of training in order to stick at it for long enough. But the good news is that in first 5 to 10 weeks of training will see big gains in fitness compared to where you are now.

When first starting out it is better to do just enough training so that you improve, rather than doing a lot of training to try to speed up the process. The reason is that training involves *exercise followed by recovery*. If you exercise too hard or too long, you run the risk of not having recovered before the next training session. If you train hard when not fully recovered, you run the risk of overuse injuries, which is not a good thing.

Focus on getting fit slowly, making sure that after each session you have enough time to be fully rested and recovered before the next session. Over time as you get fitter and your body gets used to the demands of training, you will be able to train

more frequently, but in the clinic we are sticking with just three sessions per week with a good separation between each session.

Overall the bulk on any running program has to be easy, aerobic training. The general consensus is that only somewhere in the range of 10-20% of the running volume can be hard running. It is possible to do more hard training than that, but most people can only handle that sort of overload for a few weeks before becoming burned out, overtrained and perpetually tired.

2.4 The Long Run

Of all the training sessions we do in a week, the long run is the one that will affect your overall fitness the most. This is because it puts the longest, constant load on your heart and lungs, hence driving the largest adaptations in the way that your body uses oxygen. Initially the focus is on getting time on your feet while running aerobically at an easy pace. These longer runs are a good time to focus on your running form, staying relaxed and just enjoying being outside running.

In the first few weeks of the clinic the long run will be somewhere between 2K and 5K, depending on whether you are just off the couch or have been regularly running. All of the long runs in the clinic are continuous runs (unless you get stuck at a traffic light) and are done at a gentle pace. You will not be stopping for walk breaks during these runs, so please resist the temptation to run faster and stick with your run lead. The rationale for this is that we want a gently, continuous stimulus to the heart, rather than have you run fast, get out of breath and then have to walk to recover. Spiking your heart rate high and then having to take it easy while it recovers is a valid training technique, but it defeats the purpose of the long run.

During the long runs you will be asked to focus on running with quiet feet. If your shoes are slapping the ground, or you are landing heavily, you are putting extra stress on your knees, ankles and hips. Learning how to make your foot plant quiet may take a while, and typically requires you to slow down a bit while you learn how to place your foot to reduce the impact. Slamming your feet into the ground is a major source of running injuries, so this is one aspect of skillful running that you will need to practice early in the clinic before we can build the distances that you are running.

2.5 Strength Sessions

The purpose of the strength sessions in the clinic is to make your legs stronger and improve your stamina. To do this we run hills, and as the clinic progresses you will use different hills. Initially while you are learning to run hills they are relatively short and gentle, but later on you will tackle longer and steeper hills. The steep hills are good for building muscle, the longer hills are great for aerobic stamina.

2.6 Race Pace Sessions

The purpose of the race pace sessions is for you to learn how to relax at race pace. This means that you will run at a variety of different paces, some much faster than race pace for short distances, and sometimes longer at race pace. You will end up doing some heavy breathing in these sessions, but the clinic includes sufficient rest and recovery breaks in the fast running to make sure you stay aerobic,[2] at least for the majority of the time.

2.7 Progression Through The Clinic

Within a few weeks of starting the clinic you should be starting to notice that your breathing is easier, but that your joints and legs are still feeling the work. This is because although muscles respond to training quickly, the same is not true of bones and tendons. By week six or seven of the clinic you will have to be careful that you do not go too fast or too long, because your running will be feeling easier due to your increased aerobic fitness, while your bones and tendons are still adapting to the extra load.

Initially most of your Strength and Race Pace sessions will be run on grass, as this is one way to ensure that your feet are quiet and land with minimal impact. This is to allow your muscles to get stronger while minimizing the impact loading on your bones and tendons.

2.8 The Program

In general terms the clinic follows a weekly cycle of Strength, Long Run, Race Pace, with a gently increasing workload that grows as you get fitter. The Program Lead has an overall outline plan for what each session will be through the clinic, but it has to be adjusted for each of the run groups to match how you are progressing. The first few weeks focus on building the skills and strength needed for running at 5K and 10K race paces. The focus then shifts to building stamina and learning how to relax while running faster. Then the focus shifts to learning how your planned race pace feels while building endurance and stamina. The clinic culminates in a time trial, a pre-race taper and then the race itself.

2.9 Check your email

Every week we will be sending an email to you to let you know the planned training and locations for each session during that week. If you are going to be a few minutes late for the midweek sessions it is probably best to drive to the planned location and do your warmup in that area until the rest of the group arrive. For the weekend

[2] See Chapter 3, Understanding Running.

longer runs, if you are late it will be easiest to go to the planned start location and just run the planned route. Most routes in the first part of the clinic are simple out and back runs, so you will meet up with your Run Lead and group eventually.

2.10 After The Race

Don't forget to get together after the race to celebrate your achievements.

Chapter 3

Understanding Running

On average, a resting human burns through about 1 Calorie per Hour per Kg of bodyweight, somewhere in the range of 50 to 80 Calories/hour. By a strange quirk of the units involved, running burns through the same number of calories per Kilometer that you run, 50 to 80 Calories/K. So to go from sitting to running at a 6:00/K pace, you have to ramp up your metabolism by a factor of ten. Elite athletes will have to ramp up their metabolism by a factor of about 20 to run at their race paces (under 3:00/K).

3.1 The Importance Of Warming Up

The above numbers hint at why it is important to warm up first before trying to run fast. Your heart has to pump faster and harder to increase your blood flow to move the oxygen to the working muscles and draw away the carbon dioxide. Similarly your lungs have to go from shallow, relaxed breaths to full, controlled breaths that utilize the full capacity of the lungs.

When you try to work at a rate that exceeds the current delivery of oxygen by your heart and lungs, you tap into two alternate energy systems, the *Alactic* system and the *Anaerobic* system. In the process you build up an *Oxygen Debt* that is going to have to be repaid relatively quickly.

The Alactic system uses the *Adenosine triphosphate* (ATP) currently in the muscles to do the work, but the ready supply of ATP is very limited. There is limited regeneration of ATP by Creatine Phosphate,[1] but this is also limited. Combined these two last of the order of 6 to 15 seconds of reasonably heavy work, but you could burn through all of it in a second or so by lifting a very heavy weight. And once you have burned through it, you can no longer hold the weight – the inevitable feeling that you are going to drop the weight takes over.

[1] Creatine Phosphate itself is regenerated in the presence of excess ATP, so it is normally thought of as a high speed buffer for ATP.

Once ATP starts to be used up, it is regenerated by either the *Anaerobic* or *Aerobic* systems, depending on whether there is enough oxygen nearby so that the Aerobic system can do the regeneration, or failing that the Anaerobic system does the regeneration. The *Anaerobic* system converts glucose to lactate without using oxygen to generate ATP to power the muscles, but at the peak rate of the anaerobic system, after about 20-40 seconds you start to feel the waste products from this reaction (typically a feeling of burning in your muscles). At that point your anaerobic system cannot regenerate ATP as fast as you are using it, and you need to rest. Typically however the failure is not as rapid, so if it is caused by carrying a heavy weight, you have time to put the weight down. If you are sprinting, you start to look like you are wading though deep water and you slow down.

While your alactic and anaerobic systems are working, your Aerobic system is starting to ramp up by increasing your heart rate and breathing rate. Your Aerobic system converts lactate, glucose or fat in the presence of oxygen into water and carbon dioxide and used the energy released to regenerate the ATP that your muscles are demanding. As the lactate is burned up, the burning sensation in your muscles will go away, and your anaerobic capacity is regenerated. While the lactate is being cleared, the oxygen debt that was incurred by the alactic and anaerobic system is being repaid.

> As a historical note, this is the origin of the term *Second Wind*. When untrained runners start out too fast they build up a serious oxygen debt and running becomes hard and labored. As the aerobic system ramps up and clears out the lactate, running suddenly becomes easy and effortless again. The runner is breathing deeply and the sensations of fatigue in the legs fades away, making the running feel as easy as it did at the start, hence the term *Second Wind*.

3.2 Energy Sources

One of the adaptations that occurs as you get fitter is that your body will use more fat as fuel. This is a good thing because each gram of fat provides about 9 Calories of energy, whereas each gram of carbohydrate only provides 4 calories of energy. So a 70Kg person running 10K would need about 78g of fat if all the fuel was fat, or 175g of carbohydrates if that was the main source of fuel.

For running a 5K or 10K race, you do not need to worry about eating on the run because you have enough carbohydrate stored in your body as *Glycogen* to fuel yourself for about 30K (of the order of 1,600 to 2,000 Calories). In contrast, even if you are very thin, your body will have at least twenty times that amount of calories stored as fat. So a very useful training adaptation is that the body can burn more fat as it gets fitter. Fat requires a slight bit more oxygen to burn for the same number of calories compared to carbohydrates, so when oxygen is the limiting factor, the body prefers to burn carbohydrates. This is why you might of heard of the *fat burning zone* in training, a holdover from early thinking about exercise when it was thought that after a certain speed the body turned off fat burning and

used carbohydrate exclusively. This however turns out not to be the case, whenever there is adequate oxygen, fat will continue to be burned.

Recent research on well trained runners has identified that even at high rates of work, fat contributes a significant edge (Hetlelid et al., 2015). Well trained runners can get nearly 25% of their energy from fat whereas less endurance adapted athletes can typically only get 10% of their energy from fat at the same work rates. This ability to burn more fat means that these well trained runners can run much further before running low on glycogen, a major factor when it comes to longer races such as the half marathon.

Well trained runners can get over 80% of their energy from fat burning at half marathon race paces. This is a great advantage for runners to take the time to adapt to fat burning, because while you can eat during races, digesting the food takes energy which could otherwise be used for running. Even digesting carbohydrate drinks takes some energy that would otherwise be used for running, so being able to use more stored fat as fuel is beneficial since it means that less carbohydrate has to be consumed on the run.

3.3 Easy Running

When doing easy running, the aerobic system provides most of your energy. When you initially start training, the bulk of your energy will come from burning carbohydrates, but over time, more of your energy will come from fat burning. Your anaerobic system still provides some energy even at easy paces, but the resulting lactate is easily consumed by the aerobic system because the rate of lactate generation is low.

The adaptations that result in more fat burning are thought to occur when lactate levels are low and to be partially inhibited when lactate levels rise. This means that to encourage your body to adapt to burn fat, you need to train at easy paces where you are breathing relatively easily. (Tanaka, 2016)

3.4 Steady Running

Over time, as you spend more time on your feet running, your heart and lungs get fitter and more efficient at delivering oxygen to the working muscles. As this happens, the rate of work that can be supported by the aerobic system increases, and you can run faster without having to rely too much on the anaerobic system. You will also discover that your aerobic system gets much better at clearing any lactate that is produced, so you will recover faster from any exuberance at the start of the run.

Some of your training needs to be done at these steady paces so that your body learns how to clear lactate efficiently. Your race pace is likely to be towards the middle of these steady running paces, or the higher end of these steady paces if you choose to push hard in the race to meet a goal time. If Footstock is going to be

your first race, then you should plan on sticking to the middle of these steady paces for your race pace.

3.5 Threshold Running

Threshold runs are when you run fast enough that your aerobic system can only just keep up with the demand for energy so the anaerobic system also kicks in and provides a bit more energy. When running at this pace, the lactate that the anaerobic system generates can only just be cleared by the aerobic system, so the level of lactate in your body slowly increases. Over a period of several weeks of intermittent exposure to higher lactate levels, your body will adapt to allow more lactate to be buffered. This aids your running performance because lactate is a preferred fuel for your aerobic system, and when more is available, it will be used.

Threshold runs are challenging because you are running right at the limit at which you can clear lactate. If you run just a slight bit faster, the amount of lactate will get too high and you will have to slow down while your aerobic system clears it out. Run a slight bit slower and your lactate rises enough to feel uncomfortable, but not really high enough to trigger any significant adaptations. Needless to say this is an advanced workout that we will not be using during the clinic, but can be useful later on if you decide to improve your 5K and 10K times.

3.6 Faster Running

Anything faster than your planned race pace can be considered to be fast running. At these faster paces your aerobic system is supplementing your anaerobic system so the distance you can cover is limited by your anaerobic capacity. When training at these faster paces, the clinic will have you run a short distance followed by a recovery interval and then you will repeat the fast running over the short distance.

This faster running builds strength, and trains your body to be more efficient when running at slower paces – since to run faster you have to figure out how to effectively drive with your arms and legs. In addition the heavier breathing you do during the recovery intervals improves the endurance of your breathing muscles around your torso and chest. You get practice at fully exhaling and inhaling which helps transfer more oxygen into your bloodstream.

Faster running is introduced gently in the clinic, so that the speedwork sessions become a fun thing you can look forward to. Some runners dread speedwork because they have memories of running too far and too fast in Gym class, but this clinic is all about gentle progression. Initially you will run fast for 40 or 50 meters, and then slowly jog back to the start for the recovery interval. Yes you will be breathing at bit harder, but because you will be barely using any of the capacity of your anaerobic system, these faster sessions will feel relaxed and energizing. Your biggest problem after these speedwork sessions will be slowing down your pace for the cooldown part of the session.

3.7 Fatigue

Whenever you run, your body provides emotional feedback that lets you know when you need to slow down. Your *Central Governor* (Noakes (2003)), has decided that you are going faster and further than previously, so it puts the brakes on by making your feel fatigued. This is your Central Governor doing what it is supposed to do, making sure you do not exhaust or overheat yourself.

Your Central Governor is conservative, and will put the brakes on early. On hot days, you will start out running slower than on cooler days. When the end of your race is in sight you can speed up, even if your felt very tired in the middle of the race, because your Central Governor knows that you can safely complete the distance, and hence releases the brakes. Your Central Governor learns from your training sessions how fast and far you are able to run, so by progressively increasing your training, you teach it that you can safely do more.

3.8 Cooling Down

After any running faster than an easy pace, you will need to reverse the process of the warm up. To do this you run at a very easy pace to allow your aerobic system to fully clear any lactate left over from the anaerobic system, and then allow your heart rate and breathing to return to more sedate levels. By the time the cooldown is complete, your heart rate will still be slightly elevated, but your breathing should be back to normal.

The cooldown is important because when your heart rate is elevated from faster running, the action of your leg muscles is actively assisting the heart in pumping the blood around your body. If you suddenly stop moving your legs, your heart has trouble pumping enough blood back up to your head, with the awkward side effect that you could feel dizzy or slightly faint. So if you are running fast and come to a dead stop, do what all racers do, and bend over and put your hands on your knees, so your heart does not have to pump your blood up as high to reach your head. Ideally though, after running fast you should slow down to a jog first, then to a walk as your heart rate slows back down to more normal rates.

3.9 A Note on Heart Rates

You do not need to know what your heart rate is, but many sports watches measure heart rates, so it is useful to know what you are looking at.

When you are sitting, your heart rate is likely to be in the range of 60 to 80 beats per minute. It could be higher if you have just sat down, and it could be lower, maybe even as low as 40 bpm. When you are running easy paces your heart rate is likely to be in the range 110 bpm to 130 bpm, above that you are probably running closer to a steady pace. So from resting to an easy pace, your heart can be beating nearly twice as fast, but this is not the whole story. As well as adjusting the volume

of blood pumped by changing the rate at which the heart beats, your heart can also adjust the volume of blood pumped by each beat.

As you speed up into the steady paces, your heart rate will likely increase into the 130 to 150 bpm range, and there will be an attendant increase in stroke volume as well. As your pase increases, your heart rate will likely go above 150 bpm, your maximum heart rate being dependent on how old you are and how fit you are. Your maximum heart rate is likely to be in the range from 150 bpm to 190 bpm. It will be in the lower part of this range if you are older, because older bodies cannot work hard enough to make the heart need to beat any faster. Similarly if you are fitter, your heart muscle is also fitter so it does not need to beat as fast to deliver the necessary blood flow. The highest heart rates are typically seen in the young and unfit.

The effect of training on your heart is that it will get stronger and larger, just like any other muscle that is trained. Typically this will mean that your resting heart rate will decrease, and your heart rates at easy and steady paces will drop slightly. The effect you will notice is that you can run faster without any increase in heart rate.

If you use a watch that measures your heart rate, you need to be aware that the measurements from these watches are not always precise. The chest strap measurements depend on a good conductive contact with your chest, which requires close contact with damp skin. At the start of a run your skin is likely to be dry, so there is less conductivity, and when you are breathing hard your chest is moving, making contact with the skin problematic. The watches that measure heart rate at the wrist are affected by movement of the watch on the wrist, and some appear to be affected by air temperature (possibly because the blood flow to the hands decreases when you are cold). These sources of error mean that the measured heart rates can be out by 10% or more. Overall these errors mean that you should be skeptical of any numbers you see, and if a reported number does not match with how you feel, just ignore the numbers.

Rather than using heart rate to monitor your training, it can be easier to monitor your breathing. When you are running at an easy pace, you can talk in complete sentences without any problem. At steady paces you are breathing deeper and will talk in shorter sentences, and at faster paces you will find everyone goes silent as you all focus on just breathing. The clinic run leads will be listening for your breathing patterns to make sure you are not running faster than the planned paces.

Chapter 4

Nutrition

To recap from Chapter 3 Section 3.2, your body powers itself during running by a mixture of stored Carbohydrates (as glycogen) and Fat. About 400 Calories of glycogen are stored in your liver with another 1,200 to 1,600 Calories stored in your muscles. Your 80,000 Calories or more of fat is stored as *Visceral fat* in and around the organs in the torso, and as *Subcutaneous fat* under your skin.

Interestingly your muscles are not very good at sharing their glycogen, so if a muscle runs low on glycogen it must obtain it from the liver via the bloodstream. Your liver tries to maintain a very controlled concentration of glucose in your bloodstream, and it does this by storing any excess glucose in the blood as glycogen within the liver. Typically there will be less than 8 grams or 32 Calories of glucose in the bloodstream at any time, but if your muscles and liver are full of glycogen then the level of glucose in the bloodstream will rise. When this happens, extra *Insulin* is released that causes the excess glucose to be converted into fat and stored in your fat cells. When your insulin level is high, your fat cells are inhibited from releasing any fat to power your muscles because your body needs to lower the circulating level of glucose.

4.1 Eat Normally

When you start running you do not need to change what you eat. Yes, you will burn through a few more Calories, but surprisingly few (some would say disappointingly few), roughly 50 to 80 Calories per kilometer. So a 5K run will only burn though 250 to 400 Calories, typically less than you would find in a small candy bar. Definitely less Calories than you will find in a fancy coffee and muffin at any coffee shop. Also a lot less than you have conveniently stored as glycogen in your muscles.

So when you start the clinic, you do not have to eat anything different, nor consciously adjust the quantities you eat. Your appetite will naturally adjust as you do more training through the clinic, but even by the end of the clinic the 10K runners

will not be doing more than 30K/week, so the Calories expended will be low enough not to be a concern.

> The only caveat to that is for Diabetics and others on strict Calorie controlled diets. If you fall into either of those two categories let your medical practitioner know that you will be doing the clinic leading up to a 5K race. You will be doing of the order of 8K the first week rising up to about 20K/week by the end of the clinic. This information will help your practitioner make any necessary adjustments in your treatment plans going forward. Note. The 5K race is a better option if you fall in this category as the ramp up in training is less for this race. After the clinic you can continue to build your training distances, but a slow ramp up is probably advisable.

With the volume of training you will be doing in the clinic, you will not be burning extra Calories so you do not need to consciously eat more. After the clinic if you decide you really want to run long distances, then you might need to eat a bit more, but until you are running crazy long distances you will not need to eat anything special.

4.2 Timing Your Meals

Some runners prefer not to eat a heavy meal before running, but many runners have no issues with eating before a run. With the weekend run at 8:30 in the morning, and the evening runs at 6:30 in the evening, you may find it more convenient to eat before the run rather than delay your meals until after the run. At the start of the clinic you may find it simplest to eat normally before the sessions and then as the clinic progresses and the workload in the sessions increases adjust the timing of your meals to match whatever works for you and your circumstances. You may find that you have to finish your meal at least an hour before the start of the run, or you may find that you can go running 15 minutes after your meal.

Whichever eating pattern works for you is the one you should adopt and stick to.

4.3 Staying Hydrated

The accepted advice on staying hydrated has changed over the years. The current advice is *Drink To Thirst*, which means that you do not need to drink some minimum number of glasses of water in a day. When you feel thirsty, have a drink of water, simple as that.

For the first half of the clinic you are unlikely to need to drink during the sessions, so there is no need to bring any water with you on the runs. Later on if the weather warms up you might want to bring water for the strength and speed sessions, but even then you are unlikely to need it unless it is very hot. You may find that your mouth feels dry during these heavier breathing sessions, and you might prefer to be able to have a small drink whenever that occurs. For those of you training for the

10K race you might want to carry water for the last few long runs if the weather is hot.

Please note that if you do bring water, you do not need to bring a lot. A 250mL to 500mL bottle will be more than enough. While running, your stomach is not very efficient at absorbing water, so if you drink much more than 500mL per hour you will likely find that the water just sloshes around in your stomach. Make sure that you do not start out the run thirsty and you will be less likely to feel thirsty during the run.

On hot days, it can be useful to weigh yourself before and after your runs, just to get a measure of how much water you have lost through perspiration. On a long run it is possible to lose up to 3 lbs or 4 lbs of water, and it can be useful to occasionally measure how much you lose. Assuming you drink to your thirst, you will find that you drink enough to replace that water over the next 8 hours or so. Please do not try to replace all the water immediately, as it will just sit in your stomach making you feel very uncomfortable.

> There have been reports on some marathons of runners injuring themselves by drinking too much during the race (but a 10K is too short for this to be an issue). Typically this occurs when runners in a marathon take a cup of water at each water station and end up drinking 4 Liters or more over the course of four hours. This is enough to cause exercise-associated hyponatremia, which effectively means that the runner diluted their circulating sodium so much that they were seriously ill. The problem was fully documented by Tim Noakes in his book titled Waterlogged (Noakes, 2012). The fix for this problem is to only *Drink To Thirst*.

4.4 Avoid Sports Drinks

Sports drinks were originally designed for athletes doing long duration training sessions in intense heat (think football training that goes on for hours). Over time these sports drinks were redesigned and are now a non-fizzy version of soft drinks, with equivalent amounts of sugar. You will likely find that when running these sports drinks take a long time to get absorbed in the stomach because the concentration of sugar is too high. Most endurance athletes dilute the commercial sports drinks to make them palatable during long endurance events.

There is another issue with these sports drinks, as highlighted by the Canadian Heart and Stroke Foundation: http://www.heartandstroke.ca/get-healthy/healthy-eating/reduce-sugar

> The Heart and Stroke Foundation recommends you consume no more than 10% total calories per day from added sugars, and ideally less than 5%; that is, for an average 2,000 calorie-a-day diet, 10% is about 48 grams (or 12 teaspoons) of added sugars. One can of pop contains [...] approx. 10 teaspoons [...] of added sugar.

When you ingest a lot of sugar, you spike your insulin level higher to keep the blood glucose level controlled. This causes issues when you are running since insulin promotes the storage of fat, which suppresses your ability to burn fat aerobically. This effectively means that if you start ingesting sugar during a run, you will have to continue ingesting sugar or you will have a sugar crash. The reason for this is that the insulin shuts off your ability to access your fat stores (80,000+ Calories) and you are left with just your stored glycogen (under 2,000 Calories).

The bad news is that the definition of "a lot of sugar" is four teaspoons or 16g, since if it is digested quickly it would effectively double the level of glucose in your blood. So it does not take much sugar to turn off your ability to use fat as a fuel for your running. (Sugar is half glucose and half fructose, which is why 16g or sugar when there is normally 8g of glucose in your bloodstream.)

4.5 Running And Weight Loss

If you are taking up running to lose weight, the bad news is that you are unlikely to lose weight during the clinic just from the exercise. You are likely to gain some muscle weight if you have been inactive prior to the clinic, because as part of the process of making your legs stronger, the muscles in your legs will get slightly larger. Over time if you continue running you will likely lose some weight, but it will be a slow process. One of the many reasons for this is that when you lose weight, most of that weight (84%) is exhaled as CO2. So unfortunately "Physical activity as a weight loss strategy is, therefore, easily foiled by relatively small quantities of excess food."[1]

Beware of any approach to weight loss that claims drastic weight loss quickly. You exhale somewhere between 30mg and 200mg of carbon dioxide every breath, the upper end only occurring if you are working very hard. So it is exceedingly hard to lose more than 1 pound of fat per day, so if you are losing more weight than that per day, you are dehydrating yourself, which is not a good idea and definitely not sustainable.

> If you weigh yourself every day you will see that your weight normally varies by about 4lbs on a seemingly random basis. The reason for this is that your body only regulates your fluid balance within a tolerance of about 2 liters, but since you are about 2/3 water, even at the lower end of the fluid balance you contain at least 40 liters of water. (Volek and Phinney, 2011)

If you want to lose some weight, the best approach is to follow the advice above from the Heart and Stroke foundation, and cut down the added sugar in your diet to under 5% of total Calories. Added sugar is any sugar that is added in food processing plus the sugar that you add to your food and drink. Your limit would be about 24 grams of sugar per day (6 teaspoons). To understand the rationale behind this you could read *The Case Agaainst Sugar* (Taubes, 2016).

[1] When you lose weight, where does the weight go? http://www.bmj.com/content/349/bmj.g7257

Chapter 5

The Long Run

The basics of any running program is spending time on your feet, running. This running has to be aerobic because as you have seen this is the only energy system that allows you to run for a reasonable duration. Most of the beneficial adaptations that occur with running are due to you working your aerobic system.

5.1 Benefits Of The Long Run

Long, aerobic runs improve the efficiency of your cardiovascular system. Your heart will get stronger and more efficient at pumping blood, your lungs will get better at absorbing oxygen into your bloodstream and releasing carbon dioxide back into the air. In your muscles, fine capillaries will bring more blood flow into the muscles so that more oxygen can be taken up by the working muscles and the carbon dioxide and lactate released back into the bloodstream. At the cellular level, more mitochondria form in your muscles enabling them to do more work.

In practice what this means is that you will have more energy and feel less tired even after longer duration activities. You will not get as out of breath when walking up a hill, and you will recover faster from any efforts. If you measure your resting pulse rate you will discover over time that your resting pulse rate decreases as your heart becomes stronger.

Overall the capacity of your aerobic system will have increased, so whereas previously your body went anaerobic, for the same workload you will stay aerobic. Rather than having to stop and walk after 100m of running, you can keep running for several kilometers.

5.2 How Long Is Long?

A long run is any aerobic run that requires a significant recovery before repeating the run.

When you are just starting out in the running clinic, a 30 minute run can be classed as a long run. Running aerobically for 30 minutes will leave you pleasantly tired, but not so tired that all you want to do is sit on the couch for the rest of the day. After the clinic a long run will be any run of 90 minutes to just over 2 hours. Anything longer than a 2 hour run is likely to leave you tired all day, so unless you are dedicating yourself to training for a special event, do not try to run for more than 2 hours.

> Please note that when working out how long to make your long run, do not look at the distance covered, look instead at the duration. Even elite runners rarely do a long run of over 2 1/2 hours, admittedly in that time they may cover 35K to 40K, but they keep their time on feet limited to not much more than 2 hours. In the end you will end up measuring the distance you run in your long run, but when planning the distance you plan to run consider how fast you are able to run aerobically and stay within that limit.

The normal rule of thumb is that your long run should be no more than 1/4 of your total distance run for the week. That rule does not work very well for the clinic because you are only running 3 days per week. You will need to keep this in mind for after the clinic if you ever decide to run a marathon or half marathon.

5.3 Rest and Recovery Days

Long runs tire our the legs by working your muscles aerobically for a long time. The result is very minor muscle damage that your body will repair over the next few days. As your body repairs the damage, there is some minor inflammation that triggers the repair process, and incidentally causes minor discomfort. If your legs are painful the day after the run then you know that you overdid the long run and should cut the time and distance the next time.

> The recovery and repair process in muscles requires the inflammation, so it is not a good idea to take painkillers if your muscles are sore after a workout. The effect of painkillers is to minimize the inflammation, and as such they will limit the rebuilding that occurs after training. The practice of taking painkillers after a hard training session actually defeats the purpose of the training session, which is to have the muscles rebuild and remodel to support the extra workload. It is much better to make the session easier so that you barely notice any discomfort in the muscles the day after the training, because even with this level of training there is some inflammation that will cause the muscle cells to be rebuilt and remodeled.

Your focus has to be on the idea of *Train, don't strain.* Do enough of a long run to trigger the adaptations, but do not overdo the training so that you fall into the *No Pain, No Gain* model. You should feel pleasantly tired after a long run, but you should also feel that you could have gone further.

5.4 Recovery Runs

After the clinic, if you want to do more running to improve your fitness, you can do recovery runs before and after the long run, you just need to make sure that these recovery runs are easy paced runs that do not tire you out. These easy recovery runs can help the rebuild and remodeling recovery process from the long run, by gently increasing the blood flow through the muscles.

If you choose to do these recovery runs, then initially limit these runs to no more than 30 minutes, and do these runs on the days between the longer and harder runs. Once you are running 6 days a week without any discomfort, then you can safely increase these recovery runs beyond 30 minutes.

The Brooks Hanson project(Humphrey et al., 2012) suggested that it is OK to do two back to back long runs in a week. The second run is done on tired legs, so the adaptations will be stronger after this run, but it does have the consequence that your legs may be sightly sore after the second long run. While this approach seems to work for some runners, it is not something you should try until you have been running for over a year and are able to do a 2 hour long run every weekend without any issues.

During the clinic the three sessions are equivalent to hard sessions, so they are spaced out in the week and we do not encourage any other training during the week. You can continue doing any current exercise program you are doing, just do not start any new exercise program during the clinic.

5.5 Keep Your Long Runs Easy

Make sure that your long runs are done at an easy, aerobic pace. Over the course of the clinic your long runs will gradually get longer, so each week you will need to hold yourself back to an easy pace. Later on as you become comfortable with covering the distance and spending the time on your feet, then you can let yourself speed up a bit, but you still will need to make sure that you run at an easy and aerobic pace.

This focus on keeping your long runs easy is important when you are starting out as it will allow you to focus on silent running, at a conversational pace. Running easy and aerobically trains the body to use fat as the primary fuel for the long run, which is useful for when you start doing longer runs. It is not possible to run too slowly, but very easy paces reduce the overall training effect of the long run.

On the other hand, if you push the pace on your long run you will move towards the upper end of your aerobic capability and as a result shift towards burning glycogen for fuel. This reduces the training effects that you are looking for from the long run. You will still get the heart and lung adaptations, but the adaptations in your muscles to build more mitochondria for fat burning will be less. The overall effect of running your long runs faster is that you get fitter initially, but since you are only training your heart and lungs, you will not get as fit as you would do by running your long runs at an easier pace. The tradeoff seems to occur over several months, by three months you will be faster by running your long runs faster, but at six months, you will be fitter and faster by taking the long runs at an easier pace.(Maffetone, 2010)

Chapter 6

Running Form Drills

Twice a week during the clinic we will be doing some running form drills as part of the warm up before the main work of the session. These drills are designed to assist in injury prevention by strengthening key muscles and tendons, while at the same time practicing some new movement skills. When possible we will do these drills on grass to minimize impact on the body. For all these drills just breath normally, although you might find in some of the drills that you end up breathing a bit faster. The drills work your body through the range of motions needed for running and strengthen specific muscles that are used in running. Several of the drills are focused on stabilization muscles so that you can run relaxed on uneven ground.

6.1 Kick Butt

Slowly moving forward, flick the heel up towards your butt, then put the foot back down. Aim to get the angle at the knee at least less than a right angle, ideally the heel should get close to the butt. The knee should not come forward of the support knee as shown in Figure 6.1, as you want to get a good stretch on the front of the thigh. Aim to put your foot down gently and then repeat with the other leg. Step length when doing this drill will be relatively short, not much longer than your shoe.

Benefits of this drill include

- Mobilizes knee joint
- Strengthens hamstrings and butt
- Gets you used to moving feet faster than normal

Figure 6.1: The Kick Butt Drill

6.2 High Knees

This drill can either be done in place, at a slow walk or a slow run. Lift your knee up in front of you so the thigh gets close to horizontal, and for added benefit, as your knee comes up rise up on your toes on the support leg. When putting your foot back down, put it down close to your body to that you land on your forefoot. You will need to drive your arms to counterbalance the thigh, as you can see in 6.2

Figure 6.2: High Knees Drill

Benefits of this drill include

- Strengthens muscles around the hips and stomach
- Strengthens calves and ankles
- Strengthens shoulders

6.3 Low Walk

This drill is a slow walk, but before starting the walk bend you knees. Control how hard this drill is by increasing or decreasing the bend in your knees. Ideally keep your body upright while doing this drill to get a good stretch on the back leg during the walk, see Figure 6.3. You may find this drill strenuous to start with, but you will soon build up to a reasonable distance.

Figure 6.3: Low Walk Drill

Benefits of this drill include

- Strengthens thigh muscles
- Improves flexibility at the hip and ankle
- Improves balance

6.4 Fast Feet

This drill is a slow run with an extremely fast *cadence* (see Section 6.11.1). Your steps should be not much longer than the length of your foot, this drill forces you to land on the balls of your feet. As soon as you have put your foot down you should be picking it up again. To do this drive your arms faster than normal and your legs will follow. Initially you will probably feel more comfortable looking down a bit, but as you get more practice, start looking ahead as normal for running.

Benefits of this drill include

Figure 6.4: Fast Feet Drill

- Strengthens ankle
- Puts a bounce in your stride
- Practices a forefoot landing running stride
- Strengthens stomach muscles

6.5 Sideways Crossovers

This is an agility drill where you step sideways, alternating putting your foot in front of and then behind the support leg. For this drill you land on the balls of your feet, but you should put your heel down while being supported by that leg. Your arms will need to swing out sideways to counterbalance the legs as in Figure 6.5, and you will need to do the drill twice so that both legs get practice being the lead leg.

Benefits of this drill include

- Strengthens ankles
- Strengthens hip stabilizers and knees
- Improves balance

6.6 Outside Ninjas

In this drill you run forward while maintaining at least a 50cm gap between your feet, as if you are running with your right foot on the right edge of the path and your left foot at the left edge of the path. As you get stronger, aim for a wider stance. You will have to swing your arms relatively wide for this drill. For this drill

Figure 6.5: sideways

you should land with a flat foot to ensure that you get stable footing as you bounce from side to side.

Benefits of this drill include

- Strengthens knees and ankles
- Strengthens hip stabilizers and knees
- Improves balance

6.7 Drunken Ninjas

In this drill you run forward while crossing feet in front of the support leg, as if you are staggering while running. As you get stronger, aim for a larger crossover and allow your body to wobble as your feet crossover. You will have to swing your arms relatively wide for this drill. For this drill you should land with a flat foot to ensure that you get stable footing.

Benefits of this drill include

- Strengthens knees and ankles
- Strengthens hip stabilizers and knees
- Improves balance

6.8 Strides

In this drill you practice striding out in a controlled, relaxed sprint. This drill can be done at different speeds with different stride lengths, initially you just aim for a high knee lift at the front and a straight leg to push off from as in Figure 6.6. Strides normally completes the series of drills, and you will do multiple strides, the first few relaxed and easy, allowing yourself to get a bit faster on each stride. Aim for a forefoot landing with this drill, or failing that a flat footed landing. Landing on your heel is not advised when doing faster strides as the impact will likely hurt your legs.

Figure 6.6: Strides Drill

Benefits of this drill include

- Reminding yourself that you can run fast
- Strengthens the calf and Achilles
- Lets you practice looking good for the cameras at the finish of a race

6.9 Running Form

None of these form drills imply that you should consciously try to change your running form. One of the beautiful things about running is that with time you will come to recognize your running partners just by the way that they run. Everyone runs slightly differently due to subtle differences in body type and dimensions, musculature, shoes and clothing and how fast you are moving. Very few people run like the runners we see in advertisements, but then very few people look like models either.

Everyone has minor quirks of form, some more pronounced than others. In the clinic we recognize that as you do these form drills and get more time on your feet,

your running form will change as your body learns how to run. Your running form will also change based on the pace that you are running, so during the easy warm up and cool down you will run differently than when you are practicing your race pace.

Consciously trying to change your running form is not a good idea. As with most runners, your individual running form is a result of how you learned to run with the muscles you have. Changing your form to match an image of someone else will only work if you also have the same muscles as the other person. So if you are worried about any form issue, work on the drills to build strength and let your body adjust as you become stronger. If there is an underlying issue of flexibility or range of motion, you will want to fix that and once that is resolved you will find that your form naturally changes as you no longer have to compensate.

6.10 Silent Running

An important part of the injury prevention strategy of this clinic relies on you learning how to run silently. Over the years we have learned that if your feet hit the ground so hard that they make a lot of noise, the impact forces are likely to cause injury. Many runners have tried to claim that its just noisy shoes, but that is easily disproved by simply running slower, miraculously the noisy shoes become quieter.

Every session, during the warm up and cool down, practice running silently with quiet, soft feet. Listen out for each other, you will likely find that initially everyone is quite noisy, but a few minutes into the run as everyone loosens up, you will be lighter and quieter on your feet. Whenever you are running in the clinic if you find that your feet are getting noisy, ease off the pace, slow down and get back to silent running. The run leads will be listening out for you and should be able to make some suggestions on how to reduce your impact with the ground.

6.11 Running Fast

Running fast is a skill that you will have to re-learn. Running speed is a product of cadence and stride length, so when you are warming up and cooling down, your cadence is likely to be on the low side, and your stride length relatively short, resulting in a gentle, slow pace. To speed up, you either have to increase your cadence, or increase your stride length (or do both at the same time).

6.11.1 Cadence

This is a way of referring to your step frequency, most commonly counted as steps per minute. Normal range for most runners is in the range of 100 steps/minute up to 240 steps/minute. The often quoted magic number of 180 steps/minute is not relevant for most people. Elite distance athletes might get up to that rate at 5K

race pace, but most people cannot run that fast. Elite sprinters may do over 250 steps/minute while racing over 100m (42 steps in under 10 seconds), a rate you are unlikely to reach even in the fast feet drill.

6.11.2 Stride Length

You increase your stride length by pushing off harder with your leg fully extended, not by reaching your lead leg far in front of you. This picture of Pete and Toni playing (Figure 6.6) shows what you are looking for, a fully extended rear leg, and the front foot touching down just in front of the body.

Unless you are accelerating, your foot plant will always be in front of you, but you do not want to place it so far in front of you that it acts as a brake. You will know when you do this because your knees and hips will be sore the next day, and you might also manage to bruise your heels.

A large part of the forward drive comes from the butt muscle, rotating the thigh backwards behind you. The rest comes from the elastic recoil of the Achilles and calf muscle as your foot extends as it is unloaded. You might get some calf soreness in the first few weeks of the clinic as your muscles get used to the stretch and rebound on the ankle. To alleviate this you will need to relax your calves while running and focus on getting your forward drive from your butt muscles.

6.11.3 Changing Pace

Most runners speed up from jogging pace by a combination of increasing cadence and increasing stride length. At some point trying to increase your cadence runs into a limit in that you have to work a lot harder to move your arms and legs any faster. There is also a limit to stride length, because you need more power and strength to cover more ground with each step.

The clinic uses the fast feet drill to give you some practice with a higher cadence, and the low walk and strides to improve the strength of your legs so you can handle a longer stride length. When running at a 5K race pace, some runners speed up for the finish by increasing their cadence, others speed up by increasing stride length. You will need to practice when doing the stride drills to see which strategy works best for you.

6.11.4 Foot placement (or Footstrike if you do it wrong)

Some people consider that a mid-foot or forefoot landing is best, but a large number of runners get away with their heel landing first. What matters more than what touches first is how your weight gets loaded onto the foot as your leg supports your weight. You want your leg to gradually stiffen as it supports your full weight, so that the impact forces are minimized. A good clue to the impact forces are how quiet your feet are when running on pavement. This is also the reason that the clinic starts off doing a lot of the hills and faster work on grass, so that the surface

is more forgiving of mistakes — heel hitting first with a locked knee - you are less likely to land heel first when going uphill.

6.11.5 Arm Swing

The speed with which you move your arms determines the cadence of your legs. Hence if you want to increase your cadence, just move your arms faster. The swing comes from the shoulder, not the elbow. Where possible, keep your hands relaxed, but not so relaxed that your hands are flopping about. Most people run with the elbow slightly more open than right angles, but experiment in front of a mirror to find out what works best for you.

Your arms should swing forward and back, not sideways across the body. Your arm swing is to counter balance the twisting forces from your legs, so that your torso and neck remain stable (and relaxed). Although you should aim for symmetry, you might find that one arm or the other has a slight quirk in the swing, a counter balance for some other asymmetry in another part of your body. As you fix that weakness, your arms will behave themselves.

Practice running at various paces with different amounts of elbow bend to see what works best for you. Holding your arms straight like a gymnast does not work well for long distance running, nor does holding your hands up high like a boxer. Your arms help counteract the twisting of your upper body caused by your leg drive, and you need to focus on driving your elbow backwards rather than punching forwards. You will find that when running faster your arm straightens slightly on the backswing and your biceps will get a workout.

Chapter 7

Strength Sessions

There are two different types of strength sessions in the clinic, hills and speed-endurance sessions. The purpose of these sessions is to make your legs stronger. In these sessions there is less emphasis on building aerobic fitness, instead they build your strength to allow you to run faster and be more relaxed when going faster.

7.1 Short Hill Sessions

Initially the clinic uses short hill sessions where the hill is short enough that you are working for less than 10 seconds. This means that you will be mainly using your Alactic energy system (and a small amount of your Anaerobic energy system). This allows you to generate a lot of power that will provide a stress that will encourage your muscles to adapt by becoming stronger.

To allow your Alactic system to recover between hills, you will be either walking or slowly jogging back down to the start of the hill. You should not hurry back to the bottom of the hill because you do not initially have the aerobic fitness to replenish your Alactic energy system quickly.

When doing the short hill sessions, the main thing you will be doing on the hill is the running form drills that we do as part of the warmup on the flat. As you go up the hill, you will have to push off harder to make progress up the hill, compared to the effort required to do the drills on the flat. During the clinic you will use relatively gentle slopes for these short hill sessions, but as you become stronger you can use steeper hills for these sessions.

7.2 Hill Running

After you have done some short hill sessions we will transition to doing some hill running. You will start these sessions doing the form drills on the hill, but the main

part of the session will be running up the hill and then jogging slowly back down. These hill runs will tap into your Alactic and Anaerobic energy systems, and will take anywhere between 25 and 35 seconds. You should not run these hill runs flat out, instead you should run these at a pace feels medium-hard, but not one that leaves you breathing really heavily at the top of the hill.

The best way to approach these hill run sessions is to do the first hill at an easy pace, and then each subsequent hill increase your pace slightly so that you are working a bit harder. Once you reach a comfortable level of work, hold that speed for the rest of the session. If you find that you have to slow down as the session progresses, then the next time you do the session run the hill a bit slower. If on the other hand you discover that you go faster on each hill, then the next time start the first hill a bit faster and adjust from there.

For these hill runs because you are tapping into your anaerobic system, you need to take a good rest on the way back down the hill to the start. You want to make sure that you feel rested by the time you get back to the start so that you can focus on working up the hill. As you get fitter aerobically you will recover better on the way back down the hill and you will be able to work harder on the uphill part of the session, knowing that you will recover on the downhill.

These hill running sessions are more work than the short hill sessions, but you need the grounding of the short hill sessions to accustom your muscles to the work required to get up the hill. As you get fitter aerobically it will be possible to extend these hill sessions to about 90 seconds of uphill work. When you are doing these hill runs you will find that you are tapping deeply into your anaerobic energy system, and you will be breathing hard for the entire downhill run back to the start.

7.3 Long Hills

A third way of running hills is to use your aerobic energy system to get up the hill. When doing long hills you run at a slower pace than when doing the short hills or hill running sessions. You run a long hill so that you cannot get up the hill using just your anaerobic energy system. Typically these hills will take somewhere between 3 minutes and 6 minutes to get to the top, and somewhere between 5 and 8 minutes to get back down at an easy pace.

Doing these long hills your legs have to do more work than either of the other two hill runs. These long hills are sequenced after the other sessions because you need reasonably strong legs and have developed your aerobic fitness so that you can handle 3 or more minutes of heavy breathing on the way up the hill. For these longer hills, you will need to take shorter steps with a faster cadence, effectively changing down into a lower gear to get up the hill. On a short hill you can charge at it and power your way to the top, but on longer hills yoiu need to settle into a rhythm and just work up the hill.

One way to look at all these hill sessions is that the shorter hills build strength and power and the longer hills build endurance. Initially you need the strength and power sessions, when you are more aerobically fit you can benefit from both.

7.4 Speed Endurance Sessions

Speed endurance sessions are done on flat surfaces with good footing, and the purpose of these sessions is to allow you to run faster than your planned race pace. Faster running improves your overall running efficiency by allowing you to simultaneously practice a good forward drive with your legs while keeping the rest of your body relaxed. As with the hill sessions you will do these over various distances and durations to involve the different energy systems.

7.5 Strides

Although these are part of the warm up running drills, doing strides is a good starting point for developing speed endurance. Initially you will do these over 30m to 50m so that you stay within the limits of your Alactic energy system, and then walk or slowly jog back to the start so that you are rested ready for the next stride.

When doing strides you need to think about your running form, getting a good extension on the driving leg and getting a good knee lift on the other leg. You should accelerate smoothly and gently up to the planned pace, then relax at that pace for the rest of the distance. When you have covered the intended distance, ease off and allow yourself to coast to a stop over the next 30m, easing down from the faster running into a jog then a walk. Do not try to stop immediately at the finish line, partly because stopping immediately puts more strain on your legs and tendons, also because someone else may be following closely behind you.

In the clinic please do not turn the strides into a full sprint by trying to race each other. Admittedly it is fun and going fast can get addictive, but during the clinic you need to focus on relaxing at slightly faster than race pace. After the clinic when your legs and tendons are stronger, you might want to explore how fast you can sprint, but for now *no flat out sprinting* and remember to stay relaxed in the strides.

7.6 Aerobic Strides

This is a classic session that has stood the test of time for getting runners to learn how to relax at speed. The basic idea is to stride for about 100m, then jog or do an easy recovery pace for 100m followed by another stride over 100m. You continue this pattern of stride, recovery for the planned number of strides, anywhere between 10 strides and 40 strides, depending on how much work you want to do and whether you are aerobically fit enough to do more.

Although these are called aerobic strides, it is a bit of a misnomer because you will be dipping into the anaerobic system to power you through the 100m stride. On the easy recovery your aerobic system will clear the lactate generated during the stride, so overall the session remains aerobic. They are called aerobic strides because part

way into the session you will discover that you are breathing quite heavily during the easy run 100m parts of the session.

Please note that if you go too fast on the strides, you may discover that you are not recovering fully during the easy run 100m. If this happens, do not go slower on the recovery part of the run, instead take it easier on the stride 100m. Over time as your aerobic fitness improves you will be able to run the strides faster because you will be able to clear the lactate faster. Initially though hold the speed back on the stride 100m part of the run to a pace where you can recover during the easy 100m part as this puts you at a pace just faster than your 5K pace,

7.7 Speed Endurance Repetitions

The next step beyond the aerobic strides is to transition to doing speed endurance repetitions. These can be done over distances ranging from 200m up to about 600m, though typically in the clinic we will use 300m as it provides a reasonable training stimulus for the range of abilities in the clinic. After the clinic as you become fitter and stronger you may choose to do these speed repetitions over a longer distance.

In the clinic you will aim to do the 300m repeats at 30 seconds/K faster than your planned race pace. The first time you do this session you will do anywhere between 4 and 8 repeats, with a gentle jog back to the start between the repetitions. The number of repeats will depend on how fast you are doing the repeats, initially you want to aim for about 10 minutes of faster running. The paces below are for guidance, the run leads will be allocated paces to run and you join in with whatever pace group you feel is appropriate for you.

- 1:12 for 300m is a 4:00/K, for runners planning a 22:30 5K or 45:00 10K
- 1:21 for 300m is a 4:30/K, for runners planning a 25:00 5K or 50:00 10K
- 1:30 for 300m is a 5:00/K, for runners planning a 27:30 5K or 55:00 10K
- 1:39 for 300m is a 5:30/K, for runners planning a 30:00 5K or 60:00 10K
- 1:48 for 300m is a 6:00/K, for runners planning a 32:30 5K or 65:00 10K
- 1:57 for 300m is a 6:30/K, for runners planning a 35:00 5K or 70:00 10K
- 2:06 for 300m is a 7:00/K, for runners planning a 37:30 5K or 75:00 10K
- 2:15 for 300m is a 7:30/K, for runners planning a 40:00 5K
- 2:24 for 300m is a 8:00/K, for runners planning a 42:30 5K
- 2:33 for 300m is a 8:30/K, for runners planning a 45:00+ 5K

When running these 300m repetitions, you are aiming to be RELAXED! Heavy breathing is OK, but you should be relaxed and smiling, thinking about your form, running with a faster cadence and fully straightening your rear leg.

7.8 Anaerobic Repetitions

After the clinic you may want to experiment with anaerobic repetitions to practice running even faster than the speed repetition sessions. These repetitions are run over the same distances, but run faster with much more recovery. So you may end

up running the 300m repeat at a pace 60 seconds/K faster than your planned race pace (or even faster).

When doing these anaerobic repetitions you will need a much longer rest interval to clear the lactate produced by the anaerobic system before the next repetition. Typically you will need a rest interval of 3 to 5 times the duration of the fast repetition, but you may need more. Some elite athletes when working on pure anaerobic speed over 300m will have a recovery interval of more than 20 minutes, but they are probably running the 300m in less than 34 seconds, so they need that much recovery.

Chapter 8

Race Pace Sessions

These sessions are aimed at getting comfortable at your planned race pace. These sessions are done on a flat surface with good footing. The main difference between these race pace sessions and the speed endurance sessions is that these sessions are run slower, the repetition can be longer and the recovery interval is shorter.

8.1 Race Pace Running

The clinic delays these race pace sessions until the latter half of the clinic. You need to have a reasonable level of aerobic fitness to be able to run aerobically at close to your planned race pace for any distance. The speed endurance sessions are necessary first to get you to the point where you can relax at speed, and you need to have done enough long runs to build your aerobic fitness.

Initially you will do these race pace sessions slower than your planned race pace, because you will not be as fit as you will be on race day. You will run these race pace sessions at what you estimate to be your *current race pace*, rather than your *planned race pace*.

When doing race pace sessions, it is better if you run these sessions slightly slower than you think that you can handle. It will take a few sessions before you learn what race pace feels like.

8.2 Short Race Pace Sessions

Superficially these look the same as the Speed Endurance Repetitions sessions you did as part of the strength sessions, but when you are doing these at race pace you run slower and have shorter recovery intervals. When you do 300m race pace sessions, you will not jog back to the start for recovery, instead you will run the 300m in the other direction so that you can take a short jog recovery.

Typically when running race pace sessions you will take 30 to 90 seconds recovery intervals between the faster repetitions. You will be able to handle the shorter recovery because when running at race pace you will not be dipping very far into your anaerobic energy system, hence there is much less lactate to clear during the recovery interval.

If you do need a lot of recovery between the repetitions, the likely cause is that you are running the repetition too fast and are dipping deeply into your anaerobic energy system. The fix for this is to run slightly slower, so that you need less recovery. You should be able to run each of the race pace repetitions at the same pace, if you find yourself slowing down on the later repetitions run slower on the first few repetitions the next time you do a race pace session.

8.3 Longer Repetitions

When doing longer race pace repetitions you will need to be careful to make sure you do not run faster than your race pace. The reason is that when running 500m up to 2K at race pace if you are even slightly faster than your race pace you will dip deeply into your anaerobic energy system and will be carrying a lot of lactate in your blood stream at the end of each repetition.

The recovery interval will remain the same as with the short race pace sessions, 30 to 90 seconds. This is purposefully short so that you will learn to hold yourself back on at the start of the repetitions when you feel fresh. The purpose of the recovery interval is to let your breathing calm down a bit and clear the minimal amount of lactate that you have developed while running at race pace.

During the clinic you will not do much more than 2/3 of your planned race distance in these longer race pace repetition sessions. After the clinic you can do more than your planned race distance at race pace, but as the repetition workload increases the session becomes harder and you will need a lot of recovery before doing your next hard session.

8.4 Tempo Runs

Tempo runs are medium length runs that are done slightly slower than planned race pace. You will not be doing any tempo runs as part of the clinic, but they can be a useful addition to your training mix after the clinic. After a warm up you will pick your pace up to about 30 seconds/K slower than your planned race pace. Then hold that pace for anywhere from 3K to 10K and finish off with an easy cool down. Obviously the longer you hold the pace the harder the overall session becomes.

You can also vary the tempo runs by doing a progression run where you slowly increase the pace as you do the tempo part of the run. A progression run can mimic the feelings of running a race, but this is an advanced workout that you should not do very frequently. Another advanced version of a tempo run is to alternate your pace just above and just below your race pace. A typical variation

is to run 15 seconds/K faster than race pace for 1K followed by a *recovery* 1K at 30 seconds/K slower than race pace. This variation gives you practice at clearing lactate at race pace, so it simulates a race and is a hard session than should not be done very frequently.

8.5 Race Pace Running In Long Runs

A final variation on race pace running which is not used during the clinic is to inject race pace into a long run. A common way to approach this is to do the first half of your long run at normal long run pace and then pick up the pace for 5K or more and finish off with an easy cool down for the final few kilometers of the long run.

Overall race pace sessions are the final part of the clinic training leading up to the Footstock race. You will not be doing many of the longer race pace sessions in the clinic, but the ones you do will sharpen you for the race.

Chapter 9

Racing

Racing is a skill that is subtly different from normal running. Most of the time when you are running you are encouraged to hold back a little bit so that you are able to recover in time for the next session. When racing, your aim is to do the best you can on the day knowing that you are fully rested before the race and are going to take time to fully recover after the race.

9.1 Pre-Race Time Trial

The last race pace session you will do as part of the clinic will be an out and back 4K time trial. You will do this about 10 days before race day. Effectively this is a practice race, where you run at planned race pace but do not push the finish. As part of the race practice, you will do a mass start, so you have to deal with setting your own pace correctly and will have to deal with oncoming runners after the turnaround.There will be two-way traffic on the path, so you will need to keep to the right of the path both ways.

There will be a run lead at the turnaround point calling out half way times, and another run lead at the finish calling out the final times. You should aim to run at the same pace both ways, and to run relaxed at your planned race pace. As for all race pace running, you should run with quiet feet without over-striding, and you should be comfortable at your chosen pace.

This is not a race, but a time trial to make sure that you are comfortable at your planned race pace. So do not try to chase down anyone else in the time trial, just relax and run your own pace. After the time trial you can use your overall time to make a reasonable prediction for your race time, your 5K will be about 1.25 times your time trial time, and your 10K time will be about 2.5 times your time trial time. (This prediction will be over-optimistic if you push the time trial too hard.)

9.2 Exploring The Race Course

During the clinic you will do some long runs along the race course. The reason for this is so that you get a sense of the profile of the course, where the finish of the race is and how it feels. On race day there will be distance markers along the course, but getting familiar with the course will make it easier for you to visualize where you are on the course on race day.

9.3 The Taper

The final week before the race you will be doing an active taper. This means that you will still be doing the sessions, but the volume of work will be reduced. If you do this taper correctly you will find that the Friday evening before the race you are bouncing around wanting to do something with the energy in your body. This is not the time to clean your house from top to bottom, instead sit on the couch and zone out to a movie. Save the energy for the race day.

9.4 Race Package Pick Up

A key part of every race is remembering to pick up your race package. Make sure you get to the package pick up location at least 45 minutes before it is due to close, because the worst thing you can do is get stressed immediately before the race. Remember to get enough safety pins to secure your race number to the front of your shirt. If the race includes a race expo, do not spend hours walking around the expo. Sure, have a look around, but remember to save your legs for the race.

9.5 Nothing New On Race Day

The key thing to remember about racing is to do nothing different on race day. Make sure that you are not trying out new shoes or new clothing on race day, as it would be very bad news to discover that something is rubbing during your race. This is especially true if the race package included a t-shirt, do not wear a brand new t-shirt for your race.

9.6 Drinking During The Race

Practically all races have water stations, often called feeding stations around the race course. Typically these are spaced every few kilometers along the course. In 5K and 10K races these stations will serve water and a Gatorade like sports drink. In keeping with the idea of nothing new on race day, skip the Gatorade. Over the

course of a 10K race, you do not need to refuel by drinking sugars. You have more than enough stored calories to cover 10K without any issues.

If you are doing the 5K you are unlikely to need to drink water during the race unless it is exceptionally warm. If you forget to relax while running you may end up panting during the race and hence feel that your mouth or throat is getting dry. If that happens it can be useful to stop at the water station and take a small sip of water. You do not need to drink all the water in the cup, and you definitely do not want to try drinking on the run as you have not practiced that.

If you are doing the 10K on a hot day you might need to drink something, but again, all you will really need is a few sips of water. Remember that you do not need to take a drink every time you pass a water station, you will probably feel the water sloshing in your stomach if you do stop and take a full drink at every station.

9.7 Pre Race Warm Up

Before the race, you need to get to the start early enough to allow you to do the usual easy warm up jog and drills. Basically you will be doing the same warm up that you do before the strength and race pace sessions, finishing off with a few race pace strides. You will finish these about 10 minutes before the start of the race so that your are warmed up and relaxed but not tired.

If like most people you have pre-race nerves, visit the washrooms before you start your warm up. If you wait until after the warm up you may discover that there are lineups for the washrooms.

9.8 The Start

The race organizers will get you to line up behind the start line. For races that have timing mats at the start, the organizers will not want you to cross the start line mats before the race as you will be registered as starting the race early.

When you line up for the start, line up roughly where you think you will finish. So if you think you think you have a chance of winning, then line up near the front, otherwise line up further back and off to one side. Lining up too close to the front can tempt you to go off too fast at the start of the race, as most runners who line up near the front are not that aware of the pace they can handle for the full race.

When the race starts, you might need to go a bit faster than planned for the first 50 meters, mainly so that you can move towards available gaps in the traffic. In large races, be aware that sometimes other runners may stumble at the start and you might need to dodge them. If there are young children in the race, do not follow directly behind them as young kids tend to stop when they get tired from their sprint at the start of the race, be aware that there is nearly always someone who will start walking within 100m of the start.

9.9 Mid-Race

Within the first 500m of the race you need to be relaxed at your planned race pace. Just treat the start like the first repetition of one of your race pace sessions. Take it easy at the start so that you do not go anywhere near anaerobic speeds. One of the run leads will be at the 500m mark in the race calling out times, and dropping heavy hints if you have gone out too fast.

After the first 500m you need to settle into your pace, running just the same as you did in the race pace sessions. Use your breathing and how you feel to control your pace Please do not get sucked into running faster than you planned just because somebody passes you or speeds up as you get closer to them.

Remember that the pace that feels easy to you at the start of the race will start to feel harder as you get further into the race. Provided you judge your pace correctly, your breathing will stay the same even as the pace starts to feel harder.

9.10 The Finish

About 1K from the finish you can start thinking about picking up your pace for the finish. To do this you can start to dig into your anaerobic energy system. You can choose to do this either by just speeding up slightly and using your anaerobic system over the entire final 1K, or you can wait until the finish is in sight and use your anaerobic system over the last 30 seconds or less. Picking up the pace for the entire final kilometer is the hardest of these options, and you have to judge your finish pace very well or you might hit the limit of your anaerobic system before the finish.

Your other option for the finish is to just continue your mid-race pace and finish the race smiling for the cameras at the end. This is the easiest way to complete the race, but will not be as fast as choosing to work harder in the closing stages of the race.

9.11 After The Race

When you cross the finish line, immediately start a slow recovery jog just as you did during the strength sessions. This is especially important if you chose to push your pace at the finish. You have to do an easy jog to allow your heart rate to drop back to more normal levels. A good use for the jog is to go back down the course to cheer on your friends in the race.

Once your heart rate is back down to more normal levels, then you can get your post race drink and snack.

9.12 Post Race Recovery

In the week after the race do two or three short, easy recovery runs. Start with a 2k or 3K run taking it really easy, especially if your legs feel a bit stiff and sore. Your next run can be a bit longer, and your third run can be close to your normal long run distance as long as you keep the pace really easy.

A week after the race you can start thinking about restarting your training for your next race. typically you should step your training back to what you were doing in the middle of the clinic and start to build your training up from that point.

Chapter 10

Running Shoes

Over the years a lot of misinformation about running shoes has been spread by various shoe manufacturers in the name of creating a marketing advantage. Until recently the "science" behind the shoe designs was sadly lacking. Things are starting to improve, but there is still a lot of misinformation out there.

At the most basic level, what a running shoe does for you is

- protects your foot from items on the ground
- protects your toes if you accidentally kick something
- provides good traction on varying surfaces
- cushions your legs from the ground contact forces
- color matched fashion accessory

10.1 Types of Shoes

Shoes are split into two main categories, mainly by the intended purpose of the shoe. Normal running shoes are primarily intended for running on roads and pavement, and have a tread pattern to match – relatively smooth, intended to provide a good grip on smooth pavement. Trail running shoes on the other hand have a much more pronounced tread and are intended for running on various types of unpaved trails, mud, rocks, snow, ice, etc.

Running shoes are further subdivided by intended use. Is it going to be your primary training shoe with durability as a factor, or for racing, then you might be willing to trade some durability for a lighter weight shoe. If you are light on your feet you might be able to get 500K to 1000K on a pair of training shoes, but some lightweight racing flats might be completely worn out after 200K or less.

10.2 Stack Height and Drop

How far do you like your feet to be off the ground? You can get minimalist shoes where there is less than 6mm of material separating your foot from the ground, and you can get maximalist shoes where there is 30mm of material separating your foot from the ground. Obviously you can get more cushioning in a maximalist shoe, because there is more material there to act as a cushion, but a potential downside is that on uneven ground, a maximalist shoe can put more pressure on your ankle. Another downside to cushioning is that when you want to be able to push off when running faster or uphill, a softer shoe means some of your force is lost in deforming the shoe.

Some running shoes have a very pronounced drop between the stack height at the heel and the stack height at the ball of the foot, up to 15mm in some shoes. Other lower drop shoes only have an 8mm, 4mm or even 0mm drop from heel to the ball of the foot. The advantage of the higher drop shoes is that there can be much more cushioning in the heel of the shoe, which is useful if you plan to do a lot of walking in the shoes, but it is less useful when running. Part of the problem is that when running downhill, if you have a large drop in the shoes, it is harder to get your foot flat on the ground since you have an extra wedge under the foot. Similarly you can find that the heel of the shoe can clip minor bumps and curbs, hence why most shoe manufacturers are now providing lower drop shoes. If you habitually wear heels or cowboy boots with higher heels, you may need running shoes with a higher drop. Your body is used to the higher heel, and hence the calf and Achilles will be stretched when you wear a lower drop shoe, especially when running uphill. The best solution to this is that if you normally wear heels, make sure that your slippers are flat so that around the house you give the calves and Achilles time to stretch out.

10.3 Marketing Terms

One holdover from the old days of marketing shoes is the way that shoes get labelled in stores. Neutral shoes allow your foot to move in a normal, natural motion. Support shoes were designed to prevent the full range of motion when your foot is planted on the ground, and Motion Control shoes went to the extreme of trying to eliminate the natural rolling action of the foot.

When you first start out running, the arch of your foot is probably relatively weak, so the running stores will want to suggest support or motion control shoes to support the arch. The problem with this thinking however is that if you support it artificially, the muscles and tendons in your arch will not develop the strength necessary for running. The solution to this problem is to get the neutral shoe with minimal arch support, and then build up the volume of your running gently to allow the arch to get stronger.

By the same token, using orthotics in your shoes should only be done if there is a definite medical injury or abnormality that requires the support of the orthotic.

You will need to get any orthotic fitted to your running shoes, and please remember to take the insole out of the running shoe if you are using an orthotic, or your foot will be placed in an uncomfortable position.

10.4 Buying Shoes

The best time of day to buy running shoes is towards the end of the day when you have been on your feet for a while. The reason for this is that your feet are likely to be at least half a size longer later in the day than they are in the morning. You can easily find that shoes you buy in the morning are a bit short for any longer runs done in the evening, and black toenails are not a good fashion statement.

Modern running shoes do not need any break-in time, they should feel comfortable as soon as you put them on and lace them up. If you can feel any pressure anywhere, or if something digs into your foot when you rise up on your toes in the shoe, try a different shoe. All good running stores carry thirty or forty different styles of shoe, so be prepared to take the time to try on multiple pairs to find the ones that feel most comfortable. Some of the better stores have a treadmill so you can even try the shoes out as well.

Unlike dress shoes, choose comfort over style and color. Yes, you might find the perfect color shoe that goes with the rest of your running gear, but if it is not comfortable you are not going to be wanting to wear the shoe to go for a run anyway.

If your budget allows, get two different pairs of shoes, and alternate the use of these shoes so that you do not do all your running in one pair of shoes. The reason for this is that each shoe is subtly different, so running in different shoes will strengthen your feet in different ways. You may find that one model of shoes just feels perfect, in which case get two pairs of the same model, and remember to alternate their use just the same.

Purchase replacement shoes early and try them once/month to see if they feel a lot nicer on your feet than your existing shoe, if so, retire the older pair (or only use them on the shorter, easy runs). Track the distances you have run in each pair of shoes if you want to, but the best guide as to whether a shoe is worn out is when you realize there is a reason that pair was at the back of the closet.

10.5 Tying Your Laces

Do your laces up when your weight is on your foot and your knee is forward, this emulates the push off and is when your foot puts the most strain on the shoe, so it must be comfortable in that position. After tying your shoe, fully flex your foot to ensure that it is still comfortable. You want the laces to hold your foot in place in the shoe, but not be so tight that when your foot is flexed the shoe feels tight.

10.6 Looking after your shoes

Do not wash or tumble dry. If you have lots of mud on your shoes you can rinse with a hose, but then leave them to dry naturally. Stuffing them with newspaper helps to pull out some of the moisture, but using heat to dry them out faster will decrease the life of the shoe. You may have to pick rocks out of softer soles.

Do not use your running shoes for anything other than running. Running shoes have a limited life of about 300km to 500km, and walking in them will reduce that life (since the impact of walking will compress the heels).

10.7 Racing Flats and lightweight shoes

Stay away from these until you have been running for a few years. Racing flats are lightweight running shoes with little cushioning, good for going a bit faster but you can easily bruise your feet running in this type of shoe. Unless you are really light on your feet and have quiet feet while running then you are unlikely to stay injury free running in racing flats.

10.8 What is this minimalist thing?

Minimalist shoes arose out of the barefoot running idea. Running barefoot is not a good idea in our climate, so minimalist shoes try to replicate the barefoot experience with soft, flexible soles and minimal protection for the feet. They can be useful as an occasional running shoe to make the muscles in the foot work more, but the transition to barefoot running style and minimal shoes can take more than a year.

10.9 Maximalist Shoes

In dramatic contrast to the thin soles of minimalist shoes, you can also get *Maximalist* shoes with very thick soles. Some running shoes now offer soles up to 30mm thick to provide the maximum possible amount of cushioning under your foot. Some ultra distance runners think that these shoes give extra cushioning for the long runs, but the drawback of this type of shoe is that it does not allow your foot to flex very much. The higher platform may cause issues on uneven ground by transferring more twist to the ankle while running.

10.10 Does 'Drop' matter?

Drop is a measure of the difference in the stack height between the heel of the running shoe and the forefoot. When measuring normal shoes with heels (high heels or cowboy style boots) it is common to find that the heel is 30mm or more

higher than the forefoot. So when you stand in bare feet, your Achilles tendon is being stretched by the 30mm that it is normally raised when in shoes. Running shoes are available in a range of drops, from 15mm down to 0mm. Low drop shoes of 9mm or less will take some transition time if you normally walk in higher heel shoes.

Current trend in running shoes is towards a lower drop, 8mm and 4mm drops are now becoming common when previously only racing flats were available with a low drop. Benefit of the lower drop shoes is that the heel is typically lower and hence the chances of running with a heel strike is less.

10.11 Heel striking vs midfoot striking vs forefoot striking

The barefoot running movement has raised the awareness of the problem of overstriding and heel striking. When walking everyone normally heel strikes – the impact is taken on the heel and the foot then rolls onto the forefoot as you walk forward. When running a true heel strike creates a lot of stress on the legs, so it is better to run with the main impact occurring when the foot is flat (midfoot strike). Sprinters tend to land on the forefoot, but that is typically not sustainable for longer runs.

Note that if you see a video of people running it often looks like they are heel striking when in fact the heel is touching down first but the actual impact of weight bearing is occurring on the midfoot.

Shoes with large amounts of cushioning on the heels (and hence a higher drop in the shoe) help cushion heel striking, but at the same time the large heel often hits the ground first. So the cushioning both helps the problem and causes it at the same time. Lower drop shoes alleviate this problem, but if you do overstride and heel strike, then the lower drop shoes will not be providing enough cushioning for the impact the legs are suffering.

Chapter 11

Running Clothes

One of the reasons for starting this clinic in the spring is that your clothing choices are simplest in the spring. Initially temperatures are mild, and although you might have to deal with some wind and maybe some rain, normally it never gets stupid hot or really cold. Hot days are the hardest to deal with, because when you run your body will get warmer and there are only so many layers of clothing that you can decide to take off. Cooler days are not too bad as all you need to do is add another layer.

11.1 Cooler Weather Tops

When running while it is cooler, make sure that all your extremities are protected from the elements. Typically this means a woolen hat or headband to keep your ears warm, and gloves to keep your fingers warm. You are also likely to need a long sleeved top to keep your forearms warm as well, although some people prefer to wear arm warmers rather than a long sleeved top. You might also want a thin buff to keep your chin and neck warm on the cooler days.

When it comes to running clothing, the one rule to remember is to make sure that there is *no cotton next to your skin*. The reason for this is that when cotton gets even slightly damp from sweat or rain, it becomes abrasive and will start chafing. This is not a good thing when it is your nipples that are chafing – do an image search for runners bloody nipples if you ever get tempted to run in a cotton T-shirt.

Running clothing is primarily made from technical fabrics, though some of the warmer tops may be made from Merino wool. When buying tops, check the garment carefully on the inside, as some fabrics have a different surface inside compared to outside. Make sure that any garment that is going to be next to your skin is very smooth on the inside. There are some weaving/knitting patterns that have a smooth shiny outside and a textured inside, which is good when it is a second layer, but not when that layer is next to your skin. Be sure to also check the quality of the stitching under the armpits, is the stitching thread as soft as the rest of the garment

or is it a coarser thread? One other thing to check when you put the garment on is that to make sure that it does not rub or chafe anywhere when you wear it.

One last thing to check on any tops is the printing of any logos. Sometimes the ink that is used on the logo bleeds through to the inside of the garment. Typically this bleed through ink is slightly abrasive, and depending on where it is on the garment it may end up rubbing and causing a different type of bleed through.

You are likely to need longer sleeved tops for cooler days, and T-shirts or singlets for the warmer days. Our normal recommendation is to get several longer sleeved tops of differing weights/thicknesses so that you have options for different temperatures, plus the ability to add an extra layer for when the run starts out cool but might warm up later.

For windy days you are likely to need a technical jacket that is designed to block the wind, but is sufficiently vented that it does not feel like you are running inside a sauna. This is a design specification that few jacket manufacturers seem to be able to meet. Windproof jackets for really cold weather do not seem to breathe, and if the jacket is breathable enough to be comfortable in warmer weather it is not warm enough for cooler days. The consensus so far appears to be that you will end up needing two jackets, one for the damper warm days and a different, less breathable jacket for the colder days (especially if you choose to run outside in winter).

11.2 Cooler Weather Bottoms

As long as the air temperature is above 10C, most people are happy running in just shorts, capris or compression shorts (which typically cover most of the thigh). For when it gets cooler you are likely to need either running tights, or a wind pant. Sweatpants also work but are not as nice to wear if it is raining. For really cold days having tights and wind pants works well because then you can wear the tights under the wind pants, a combination that will work for most people down to about -20C (also known as stupid cold).

Surprisingly you are not going to need to wear anything extra on your feet when the weather gets cooler. As long as your running shoes do not have very porous mesh uppers, you are going to be able to wear the same shoes at stupid cold temperatures as you do for any other run. You will need to wear socks that cover your ankle up to the bottom of your running tights when it is cold.

Running socks should not be cotton socks, for the same reason that you do not want to wear cotton T-shirts. When cotton socks get wet, they can easily chafe your feet or cause blisters, and either of which will make your next run painful. Interestingly, while you are getting a blister you are unlikely to feel anything wrong until the blister pops. So buy woolen or technical socks, your feet will thank you.

11.3 Warmer Weather Tops

As soon as the weather starts to warm up and you are exposing skin, invest in waterproof sun screen and wraparound sunglasses. The first day it is warm enough for you to wear a singlet your shoulders will get sunburned on our long run if you do not wear sunscreen. You may also find you get a headache from squinting in the bright sunshine.

A running cap or visor can also be useful as we head into the summer. If your hair is thick and long, then a visor might work best, but thinner and shorter hair will need a running cap to prevent the top of your head from getting sunburnt. Better caps and visors have toweling in the headband to stop sweat from running down into your eyes.

In warmer weather most runners wear thin T-shirts or singlets, but you will find a few people wear long sleeved sun block tops. The sun block tops are ultra thin Lycra tops originally designed for surfing in hot sunny climates, but have turned out quite effective at keeping runners cooler in the hot sun.

11.4 Warmer Weather Bottoms

Shorts, capris or compression shorts are basically all you need on your legs when it gets warmer. You will need sunscreen, as it is amazing how painful sunburn is on your calves, especially when you get in the shower after your run.

Some runners choose to run sockless in the warmer weather, others choose thinner socks, others wear the same type of socks all year round. The key factor to remember is that you do not want your feet moving around in your shoes and rubbing on any part of your foot.

11.5 Underwear for Running

For women, you will need a sports bra or running bra to get the support you need on longer or faster runs. All good specialist running or triathlon stores carry a wide range of options and it pays to get a bra that fits well and supports you. You could possibly get away with your normal bras if all you are planning on doing is the 5K race, but few women runners would recommend doing so.

For men, regardless of personal preference between boxers and briefs, you will need the support of briefs when you do longer or faster runs. Boxers allow too much freedom of movement and chafing in the groin area is reportedly somewhat painful.

11.6 Where to get your Running Clothing

It used to be that you had to go to specialist running or triathlon stores to get decent clothing for running, but now most sporting chains carry reasonable running clothing. The specialist stores still have the edge in that they carry a wider range of the high end and better quality clothes. For decent running shorts and running bras you will probably still have to go to the specialist stores, but for generic technical tops and pants you can basically find them anywhere. Sometimes you can be lucky at the larger discount stores, where you can find steep discounts.

11.7 Caring for your Running Clothing

Taking up running means that you are going to have to do an extra laundry load. Although it is not stated on most of the labels, you do not want to use any fabric softener with your technical running clothing. Fabric softeners interfere with the treatments on the technical fabrics and over time will degrade the material. Despite what it might say on the labels, your technical running clothes should not be put in the dryer, just hang them up to dry like all delicate fabrics.

Chapter 12

GPS Watches

You will not need a GPS watch during the clinic as the run leads will be wearing GPS watches and are responsible for setting the pace during the clinic sessions. Your run lead will be able to tell you how far you have gone in each session if you are interested in the numbers. In the later part of the clinic, you could wear a normal watch so that you can time your own repetitions and hence get a better fix on your own paces.

To a large degree you can learn to monitor your pace without a GPS watch. By noticing your breathing you can easily tell if you are running at an easy pace or a medium pace. When you are reaching your maximum aerobic pace your heavy breathing will be obvious, but you might find it harder to judge how fast you are when you are running faster than race pace.

12.1 Useful Features

12.1.1 Distance and Pace

The nice thing about GPS watches is that they provide a reasonably accurate measurement of the distance covered in a run. Typically if you are running in open areas a GPS watch will be accurate to within about 1%, but this accuracy drops off in built up areas, hilly areas and heavily wooded areas. The accuracy depends on your watch having a good line of sight to the GPS satellites, so when part of the sky is obstructed by buildings, hills or trees, the accuracy is decreased.

With an accurate measurement of distance, a GPS watch can provide information on your pace, for the complete distance as well as split times for each kilometer run. GPS watches can show your current pace, but unlike a car speedometer, the current pace as measured depends on how the watch calculates the current pace. If the watch averages your pace over the last second, then there will be a lot of variability in the pace, but if it averages your pace over the last 10 seconds then it will not respond to changes in pace very quickly.

12.1.2 Heart Rate Information

Many GPS watches also provide heart rate information, either through a chest strap or wrist sensor. The chest straps work via skin contacts measuring the electrical signals from the heart, while the wrist sensors use light to measure the blood flow in the wrist. The wrist sensor mechanism is not as reliable or accurate, but a lot more convenient and the technology is improving.

The main benefit of having heart rate information lies in making sure that you do not run too fast on your long runs and when warming up and cooling down. While running at a constant pace your heart rate will slowly increase as the run progresses. This *cardiac drift* is relatively well known and typically will cause a rise of 10 bpm over the course of a 60 minute run while your pace stays the same. This drift means that you cannot use your measured heart rate as a definitive limiter for your pace, but you can use your heart rate as a general indicator of your work rate.

Do not use your heart rate to control how fast you run during strength and race pace sessions because it takes a while for your heart rate to respond to speed changes. When doing race pace sessions it can take 2 or more minutes for your heart rate to rise in response to the race pace running. During the shorter strength sessions you may find that your heart rate gets higher with each repetition and typically is highest at the start of each recovery interval.

Overall though knowing your heart rate can be interesting, but it is mainly useful for controlling recovery rather than controlling the work you are doing in any sessions.

12.1.3 Cadence Information

A newer feature that is becoming available on some GPS watches is cadence information. This is done either via an accelerometer in the watch or a foot pod that tries to measure how many steps you take per minute. Using the cadence information the GPS watch can estimate your average stride length.

Cadence information is somewhat useful in that it will let you know whether you tend to take lots of shorter strides or fewer, longer strides. It will also show you the strategy you use to speed up, some runners just increase their stride length to speed up, others will increase cadence. When moving to a sprint pace, most runners significantly increase cadence, often accompanied with an increase in stride length as well.

Cadence tends to be an outcome of the surface that you are running on. If you are running on a muddy surface your cadence is likely to be higher, but when the surface is solid with good traction, then your cadence will tend to be lower as you can cover more ground with each stride. Although it can be interesting to know your cadence, you need the ability to adjust your cadence to match how fast you want to run and the surfaces that you are running on.

12.2 Other Features

Since GPS watches are just wearable computers, the capabilities of these devices is continually changing. A lot of the features that have been added fall into the category of being potentially interesting, but not very useful for guiding your training. As part of the marketing of the new features there are many claims that are made that to date have not proven to produce the claimed results

12.2.1 Intensity Minutes

While it can be useful to track how hard your training sessions are, the way that this is currently done is not very useful. Most watches record your training minutes as either easy, or intense and then count the intense minutes as double value of the easy minutes. The end result is that a 60 minute long run would be counted as a harder session than a hill running session, but you need a lot more recovery after the hill session than you would after the long run.

12.2.2 Ground Contact Time

Faster runners tend to have a short ground contact time. This is an obvious effect of running faster, because if you were to run a 15 minute 5K your feet would have to be moving quickly. Hence the time any foot spent on the ground supporting you or pushing you forward is bound to be shorter. When you are moving at a very easy pace, your steps are shorter and you naturally spend more time with your foot in contact with the ground.

Since it is now possible to measure ground contact time, the higher-end watches are now getting this feature. There is no evidence yet that you can usefully change your training to decrease ground contact time and whether this will improve your running.

12.2.3 Vertical Oscillation

Closely related to ground contact time is the measurement of vertical oscillation while running. Some runners bounce a lot while running, others just seem to float along the ground. The thought is that bouncing along is wasteful of energy in that you are having to do work to raise your center of mass upwards on each stride. Hence the claim being made is that if you can decrease your vertical oscillation you would be able to run faster.

In practice vertical oscillation tends to be related to running speed, the faster you run the less vertical oscillation, but the converse is not true. If you deliberately try to decrease your vertical oscillation you will not run faster.

12.2.4 Heart Rate Variability

Although we often think of the heart as beating regularly, there is a certain amount of variability of the time between heart beats. There is some evidence that when fully rested the variability of the heart rate is higher than when you are tired. The idea behind measuring the heart rate variability is that you should not do another hard session until your heart rate variability has recovered to what it was prior to the previous hard session.

Unless you are free to train as soon as you are recovered from your previous hard session, you will not gain much value from this information. Full time athletes can benefit because they are free to train at all times of the day, but most people have to fit their training around work and family.

12.2.5 Virtual Pacers

Many GPS watches allow you to set up a run against a virtual pacer. The idea being that you define a run profile, either based on a previous run over the same course, or based on a preset pace for the course. The value of this feature is dubious because the virtual pacer will not take into account the current weather and how your feel on the day. So running against a virtual pacer may mean that you are running much harder than you should be for the run, or conversely not running easier than you could because you are feeling great and could easily leave your virtual pacer in the dust.

12.3 Do Not Push For Records In Training

One of the hazards of having a smart GPS watch is that they track your personal records. This can tempt you into running faster or further than you meant to just because you are close to a personal record. If you feel that you could fall into this trap, then it is probably safer for you to get a basic GPS watch that only has the ability to show your pace and distance covered.

12.4 Running and social media

There are many social media sites that allow you to upload and publish information about your runs and training sessions. While these sites can be useful for sharing information with your closest friends, please be aware that you can end up inadvertently advertising personal information about yourself to a much wider audience. You might not want to publish to the world that your house is going to be empty every Monday evening between 6:30PM and 7:30PM while you go for a run. This is especially true if your watch offers live tracking of your progress along your route…

Another aspect of these running related social media sites is that they can bring in an element of competition into your training. Most have the concept of record

holders for segments, such that for any commonly used route you will be able to find your ranking to say how fast you are on that segment of the run compared to all other runners who have shared their data. Please do not fall into the trap of continually comparing your progress to others, or running harder than you meant to just to make an impressive posting on a social media site.

Chapter 13

Cross Training

During the clinic we do not suggest you start doing any extra training outside of the clinic unless you have already been doing that training for six months prior to the start of the clinic. The reason for this is the volume of work in the clinic is enough without adding any extra training stress from other activities.

After the clinic you may decide that you need some extra training to suppliment your running, and there are several options that complement running.

13.1 Cycling

All forms of cycling are good for improving your aerobic fitness, but compared to running you will have to do longer duration rides to get the same training effect. Cycling is a lot more efficient than running for covering distances, plus you get to completely rest on the downhill portions of your ride.

Many runners choose to replace a long run with a long cycle ride on the weekend. The leg muscles used in cycling are sufficiently different than the muscles you use in running that you can safely cycle the day after a long run without any issues (other than feeling a bit tired on the cycle.) Cycling puts a lot less stress on the ankles so it is a viable alternative to running if you feel any soreness in your ankles or shins and need to rest your legs for a few days.

If you get really hooked on cycling there are duathlons, races that combine running and cycling, some duathlons are a ride followed by a run, others are run, ride, run. If you intend to try a duathlon race you will need to practice running immediately after riding because the transition from the ride to running can feel somewhat strange for the first 500m of the run. Your legs seemingly want to continue pedalling while you try to remember how to run.

13.2 Swimming

Swimming is another common way that runners get in more aerobic training while staying off their feet. Until you are sufficiently skilled at swimming it is not a very aerobic activity, but once you have learned to swim well, it becomes a more intense aerobic activity. Prior to that, all you are really doing is flailing with your arms and although you will tire your arm muscles out quickly, you will find that you do not need to breathe very hard.

If you like swimming and cycling, then there are triathlon races to try out. Swim followed by a ride followed by a run, the runs being typically 5k, 10k or even longer if you try the ironman distances. For tiathlons, practice doing the transitions between the different disciplines pays off.

13.3 Yoga

Some of you may discover while running that you are not quite as flexible or strong as you thought you were. Yoga is a form of exercise that will help improve your flexibility while also strenghtening your muscles. There are many forms of Yoga, some focus more on the relaxation and flexibility side, others more on strength, and there is also Hot Yoga for those who want to combine Yoga with a Sauna experience.

Yoga is non competitive so there is no opportunity to combine Yoga and running.

13.4 Gym Classes

After running for a while you will not need to take any cardio gym classes, but you may benefit from the general conditioning classes. These typically have a wide range of exercises designed to tone and strengthen your muscles.

Please take it easy if you ever sign up for any *Boot Camp* style gym classes. After finishing the clinic you will have very good aerobic fitness compared to the normal attendees at gyms, so you can easily end up overdoing it and making your muscles really sore. A particular thing to watch out for is *Delayed Onset Muscle Soreness* (DOMS), where you can feel really pumped and energized during the gym class and the next day everything is stiff and sore. The next day part is why this is called *Delayed Onset* Muscle Soreness. Typically DOMS occurs from eccentric overloading of muscles and it is something to be avoided as it can take a week or longer before your muscles are fully healed.

13.5 Weight Training

Weight training is a good way of getting your whole body stronger, but not one that many runners choose to adopt. Depending on how you choose to do weight

training you are unlikely to add any significant muscle bulk, you might see slightly better muscle definition, but adding bulk is quite difficult.

Weight training is not an aerobic exercise, so it is not an alternative to running for overall fitness, but it is good for overall strength of your muscles and bones. There are some studies that suggest that older people who do weight training have better bone density than people who do not weight train.

Overall all forms of cross training are useful, but if you plan on becoming a better runner, you will need to run. At peak, in the clinic you will do about 30K/week, but you can safely and easily do 60K/week or more and will find that you are fitter as you increase your weekly running distance. So cross training should be seen as an addition to your running training, not as a replacement for running.

Chapter 14

Running Myths

There is a lot of misinformation and myths surrounding running. Whenever you hear anything about running, first think of where the information is coming from and apply some critical thinking skills to the presented ideas.

14.1 Runners Need To Stretch

Despite what you may have heard, the prime benefit of stretching is that it makes you more flexible. Unfortunately being more flexible is not really a factor in running unless you choose to be a hurdler. In the running drills you will move your body through the full range of motions meeded by runnning, and unless you find some tightness while doing those drills you do not need to do any extra stretching.

If you do choose to stretch, please do not do static stretches prior to running as static stretches place a lot of stress on your muscles and tendons. Several studies have shown that static stretches prior to a run reduce the power available in a muscle and will slow your running down. So if you want to be more flexible, then continue to stretch, but please stretch on non-running days.

14.2 Running Is Bad For You

Every so often you will come across a news item that claims that exercise or running is bad for you, or your joints or that if your do too much then bad things will happen to you.

While mechanical things like cars do wear out and break down with usage, with biological systems the opposite is true. For biological systems the way to think of it is *Use It or Lose it*. When you run you strengthen your muscles, bones and joints and there is ample evidence that long time runners have much healthier knees and joints than non-runners.

Yes, a 75 year old runner may complain about sore knees and ankles, but they are able to go for an easy 10K trail run. In contrast a 75 year old non-runner may complain about sore knees and ankles while they are barely able to shuffle around a supermarket to do their shopping. Bone density and joint health will on average be much better in any runner than any non-runner 10 or more years younger.

14.3 Perfect Form

Despite the claims made by multiple inexperienced coaches, there is no such thing as a perfect running form that everyone should adopt. Yes, there are some runners who look really smooth while running, but there are many others whose running form is anything but pretty but they are still very fast. Paula Radcliffe still holds the women's marathon record as of 2017 despite having a unique way of moving her arms and head while running. Michael Johnson held the 400m record for many years, only losing it in 2016, despite having an exceedingly upright sprinting style.

One problem in changing running form is that what you look like while running has practically nothing to do with the efficiency of your running form. So many changes that make a runner look nicer while running can decrease the efficiency of running.

The evidence to date is that everyone has their own running form and that any attempt to drastically change that running form will be detrimental to that runner. Over time with more running and various strength exercises a runner's style will naturally adjust, but there is no safe, effective and quick way of changing a runner's form. But hope springs eternal and there are multiple books and videos out there promoting the idea that it is possible to change your running form.

14.4 The Ideal Running Cadence of 180 steps/minute

A running cadence of 180 steps/minute was first recorded at the 2007 world championships 10K race. From one observation of elite athletes, the cadence of 180 steps/minute got entrenched as the ideal running cadence. One amusing part about this is that none of the three runners studied in that race actually ran at a cadence of 180. The eventual winner ran at a cadence of 190 for most of the race and did his finish kick at a cadence of around 216.

http://www.scienceofrunning.com/2010/11/speed-stride-length-x-stride-frequency.html

Suggesting that everyone should copy the cadence of elite runners moving at world championship race pace is crazy. Cadence naturally changes with pace and surface traction, and also depends on your build and height. Run at what ever cadence works for you, just remember to shorten your stride when going uphill.

14.5 Better Shoes Cost More

There is no real correlation between the cost of running shoes and how good those shoes are. The cost of shoes is dominated by marketing factors, and many of the fancy gimmicks on shoes do not add any value to the shoes. The most important factor when choosing a running shoe is that it feels really comfortable when you are wearing them.

14.6 Secret Training Techniques

There is no secret to the process of getting better as a runner. There is no one exercise that will dramatically make you a better runner. The basic way that you will improve as a runner is to spend more time on your feet. The running magazines always have a article or two suggesting that there is a training session that you absolutely need to adopt, please ignore this journalistic hype.

Chapter 15

Running Etiquette

This is a semi random list of things that longtime runners do naturally that beginners might have not thought about…

15.1 Training With A Partner

When you run with a partner, the goal is that both of you enjoy the training, so do not use the opportunity of running with someone to prove that you are faster. When you are doing a long run or an easy recovery run it is OK to go a bit slower than normal. Run at a slower pace to allow your partner to keep running with you. If you are the slower runner, let your partner know the pace is a bit too fast for you rather than push the pace.

It is OK if you see a hill ahead and announce that you are going to *play on that hill*, then your partner knows that you are going to speed up the hill. Remember to be nice about it though. When you get to the top jog back down to meet your running partner, and run up the rest of the hill with them. You will really annoy your running partner if you rest at the top and when they reach the top start running again not allowing them to catch their breath after the ascent.

15.2 Do Your Own Training

It can be fun to join in on a training session with other runners, but make sure that you train appropriate to your current fitness level. Do not try to keep up with other runners and especially do not try to race them in training. It is very easy to follow along after another runner and end up going too far or too fast for your current fitness level and getting injured. Any injury is not the fault of the other runners, but the consequence of you not running within your current capabilities.

The safest thing to do when joining in with a new group or training partner is to tag along behind the others for the first session, running at your own pace. During the recovery intervals you can gauge how you are doing compared to the others. Then the next time you join in with them you will have a better idea of where you fit in the group.

15.3 Running on Paths and Trails

When you are approaching someone from behind on a path or trail, greet them when you are reasonably close. There is a fine balance between silently moving past others and surprising them out of several heartbeats, and greeting others and seeing them jump because they thought they were alone on the path. If you are running with others, go single file to pass others unless the path is very wide.

Before slowing down or turning on a path or trail check behind you to make sure that another runner is not about to pass you. If it is a nice soft trail you might not have heard someone coming up behind you doing a tempo run, and if you suddenly change speed or direction it will be a lot more painful than a fender bender in a car.

15.4 Group Runs

Stay together and loop back for slower members

Don't let anyone fall off the back of the group, especially if they are new to the group.

Make sure everyone knows how far and how fast the run is intended to be, possibly looping back to the start part way so that runners who want a shorter run can still participate while allowing the other runners in the group to get in a longer run

Don't block the pathways, go single file early so that other people on the pathway are not forced to the side.

When in the front of the group call out if there are any people on the pathway, or if you see any hazards that might not be immediately obvious to the runners following in the group.

15.5 Running and Animals

Dogs like to chase runners, so do not tempt them by running in off leash areas. Similarly if a dog is loose in a yard, find an alternative route if the owner is not normally present to control their dog.

On mixed use trails with horses, do not run directly behind horses, move to the edge of the trail and call out so that the horse knows that the thing approaching fast from behind is not a predator. You do not want to spook a horse.

Similarly when on trails that go near cows, be prepared to stop and walk to avoid spooking a herd of cows. Ranchers and farmers do not look kindly on people who spook their animals and cause the animals to break fences or get injured.

Avoid running in areas where there are known predators. Yes, you do not need to outrun the bear, just your slower running partners, but it is better not to tempt the predators

15.6 Track Running

When running on athletics tracks, stay out of the inside lane. The inside lane gets the most use in competitions, so for training don't use it if you do not need to (admittedly this was really important in the days of grass and cinder tracks, but many modern synthetic tracks have an obvious groove in the inside lane from overuse and poor maintenance.)

Look both ways before crossing any lane – it is amazing how fast sprinters can be moving – the impact will be similar to falling 3 meters or more and landing on your side.

When moving out to overtake someone, shoulder check to make sure that nobody else is coming up to pass you. It is practically impossible to hear someone coming up behind you on a synthetic track, so you have to look (except in a race but then the relative speed differences will be a lot lower.)

If you are going to be lapped in an open track race, move out to the second or third lane so as not to impede the runners at the front of the race. Yes, you will end up running further in the race, but you will not block the race leaders.

15.7 Avoid Mentioning the Pace

Unless you know someone really well and have been running with them for a while, avoid asking about pace and race times, because that can be a sensitive subject. A race time that seems slow to you may be the result of many years of hard training, and what you think is a really fast time might be an abysmal showing due to any one of a myriad of factors. Overall it is safer to avoid commenting on pace and times.

When arranging for a run you need to state what pace you plan to run at and how far you plan to go, but that is for information rather than comparison, so that you run with others who are planning on running at the same pace. Remember that it is always possible to run slower or shorter than you planned to, but rarely a good idea to run faster or further than you planned to

Chapter 16

Run Leads

The role the run leads is to ensure that you enjoy your participation in the clinic. Although the run leads are there to encourage you in the clinic, much of the time they are likely to be asking you to control your pace and run relaxed at an easy pace.

16.1 This Is Your Clinic

The run leads are at the clinic to help you. Most of their training is happening outside of the clinic, so it might look like they are taking it easy during the training. This is so that they can watch and observe how you are doing in the various sessions. Most of the time they will be either running alongside you or behind you so that they can observe your running.

16.2 Warming Up

During the warm up, please let your run lead know how you are feeling and how you are responding the various training sessions. You will have to do the warm up slow enough that you can talk comfortably and get deep into a conversation. Your run lead will be wearing a GPS watch so that they are aware of the pace, but they will also be listening to your breathing and footfalls to make sure that you are running at an easy and controlled pace on the warm up.

16.3 Form Drills

During the form drills, your run leads have a dual role. In part they are there to demonstrate how to do the drills, and they will be watching and guiding you in

doing the drills with good form. The run leads will be doing the drills alongside you, so use then as a pace guide for how fast you should be doing the drills.

16.4 Strength Sessions

When doing the strength sessions, do the work at your own pace on the hills. Join up with your run leads on the recovery run back down the hill to the start to make sure that you are getting enough recovery on the downhill part of the run. When doing the strides, use the pace of your run lead as a guide to how fast you should be moving on the strides, and then on the recovery jog back make sure that you stay with your run lead. If you are feeling good after the first few strides it is OK to go faster than your run lead – just make sure you are not trying to race anyone.

When doing the speed repetitions, you should join in with the appropriate speed group and stick to the pace of the run lead for that group. If you find that the recovery is insufficient, drop back to the next slower group to ensure that you are running easier on the speed repetition.

For all the strength sessions, make sure you do not get ahead of your run lead on the recovery. If you cut the length of the recovery down you will make the session a lot harder than it is intended to be.

16.5 Race Pace Sessions

For the race pace sessions, you should join in with the appropriate speed group and stick to the pace of the run lead for that group. The run lead will be checking the pace with a GPS watch. Your race pace is bound to feel easy at the start of these sessions because you are fresh from the warm up, it should feel easy until the last few repetitions of the session.

During the short recovery for these race pace repetitions, your run lead will encourage you to jog slowly as this helps with your recovery. it also makes sure that you clear the finish line of the repetition so that no other runner in a following group runs into you.

16.6 Long Runs

The long runs are meant to be done at an easy, conversational, aerobic pace, and the key role of your run lead on the long run is to make sure that you are able to talk at the long run pace. At the start of the long run your run lead will hold the pace back slightly to allow you to warm up gently, and then towards the end of the run your run lead will encourage you to ease off the pace to cool down slightly.

Your run lead will encourage you to run your long run at an easy pace. There is no benefit to running your long run fast, you need to make sure that you are completely

aerobic with the minimal contribution from your anaerobic energy system. This encourages the maximal development of your mitochondria in your muscles which are the parts of your muscles that power the aerobic system.

16.7 Cooling Down

The final responsibility of the run leads at the end of every session is to make sure that you cool down at a very easy pace. After the strength and race pace sessions it is important that you run at an easy aerobic pace to clear out any lactate remaining from the faster paced running in the session. This is also a good time to ask your run lead any questions you have about the session and your training so far.

Chapter 17

Program Lead

The role of the Program Lead is a dual one of organizing the clinic and being the visible face of the clinic during the sessions. The Run To Footstock clinic is run by the Red Rock Runners club, but running clinics are also put on by specialist running stores. The goal of the Red Rock Runners club in putting on the clinic is to get more people interested in running so that we have more runners coming out to the club runs. When specialist running stores put on clinics, they are promoting the sport and also creating customers, since all runners need to buy running shoes and clothing.

17.1 The Race

A running clinic works best when there is a target race that all participants are preparing for, so the choice of that race is important. Ideally it should be a local race, but it can work to have a clinic leading up to a destination race as well. In either case the role of the Program Lead is to choose a suitable race and then pick the appropriate duration to get participants ready for the race. For a 5K or 10K race clinics are anywhere between 8 and 12 weeks duration, and for a half marathon clinics are in the range of 15 to 20 weeks long.

The Run To Footstock clinic is 11 weeks long as it is designed for beginners and runners wanting to improve their race times. The longer duration allows for a more gentle build up for beginners and an extra few weeks of focused training helps those wanting to improve their times.

The program lead has to coordinate with the race organizers to get a block race entry for the clinic participants, and also to find out the race routes. Using the race routes for some of the long runs on the clinic makes it much less likely that anyone will get lost during the race.

17.2 The Run Leads

With the Run To Footstock clinic being designed for a wide range of abilities, the clinic also needs to recruit a set of run leads who can cover those paces. Getting run leads for the faster paces can be a challenge, but the larger challenge is to get run leads for the complete beginner paces. Many experienced runners are happy to run at a 6:00/K to 7:00/K pace, but find it harder to run at a 10:00/K to 12:00/K pace. Luckily though, all it takes is a few practice sessions to get comfortable at that pace.

17.3 The Talks

The Wednesday sessions start with a short 20 minute talk and discussion about the purpose of the upcoming week's training and how the participants are handling the training. These sessions also cover the major topics covered in this manual, from shoes and clothing, to nutrition and race preparation.

These talks increase the organization required for the clinic because they mean that the group has to meet in a suitable indoor venue out of the weather. There is no need for any specialized visual aids in these talks, the purpose is to have a relaxed, informal discussion about the topics. Immediately after the talk everyone will be going outside to do the clinic session, so the talk must not put everyone to sleep.

17.4 The Sessions

The Program Lead is responsible for tailoring the overall sessions on a week by week basis to match the progress of the participants. In consultation with the run leads, the program lead has to adjust the workload for each of the run lead groups to ensure there is a gentle progression while shuffling participants between groups depending on how each individual participant is responding to the training.

Run to Footstock is set up so that the Wednesday sessions are the Strength sessions, the Saturday sessions are the Long Run sessions and the Monday sessions are the Race Pace sessions. This pattern leaves at least 2 complete days of recovery between each session and the regular pattern lets participants prepare for each session.

The Strength and the Race Pace sessions start with a warm up and then the various form drills (Chapter 6), and finish with a gentle cool down. The drills are not done during the Long Run sessions, but care is taken to make sure that the groups ease into the long run and then slow down towards the end of the run.

17.5 The Long Run Sessions

Before the taper week of the clinic, the long run needs to be at least 1K longer than the planned race distance. The first week of the clinic the long run will be no more than 2K for the beginners and will build up by about 1/2K every week through the clinic. Some weeks the distance will not increase or might even need to step back to a prior distance to provide an easy week depending on the group and the conditions. On exceptionally hot days it is probably better not to increase the distance that week.

For the runners planning on improving their race times, the first week long run will be somewhere in the range of 3K up to 5K and will build up by 1K each week. As for the beginner group it might be necessary to take an occasional rest week where the distance does not increase. For experienced runners in this group the long run may reach 15K by the taper week, but only if that distance can be covered in under 90 minutes.

Where possible some of these long runs will be done on portions of the race course to familiarize the participants with the route. Other runs will be done on softer, scenic trails to allow participants to experience the wider variety of running that is available in the area. The program lead is responsible for choosing the appropriate distances routes and for making sure that each run lead knows the route and pace for their group.

During the long runs the program lead will run with various groups. By organizing the routes so that the run is a simple out and back, the program lead can see all of the groups in one run. Alternatively the run lead can start out with a faster group and then drop back to the next group as the run progresses. This way the program lead can become familiar with how the participants are responding to the long run, and answer any questions along the way.

17.6 The Strength Sessions

The strength sessions start with an easy warm up and the running form drills. The program lead needs to choose a location for the drills that is a flat, well maintained grassed area that has multiple routes from the start location to where the drills will be done. This allows the beginners to take a short route to the drills area while more experienced runners can take a slightly longer route and still arrive at the same time. There also needs to be a short, relatively gentle hill near to the drills area for the initial short hill sessions, Chapter 7 Section 7.1.

For the hill running sessions, Chapter 7 Section 7.2, the program lead needs to find a longer (50-70m), relatively gentle grass hill. There should be options for the route to this hill as the different run leads will need different warm up distances. For the long hills, Section 7.3, the program lead needs to find a hill that is at least 300m long, ideally it should be a grass hill, but since this is only used later in the clinic it can be a paved hill.

The strides part of the strength sessions can be done on the same area as the drills, but when doing the aerobic strides, Section 7.6, a larger area is needed. One good option is to run around the outside of a football pitch, using the long side for the strides and the shorter edge for the easy recovery part of the session.

The speed repetitions sessions, Section **??**, need a flat, straight 300m paved pathway. Since these sessions occur later in the clinic, the surface should be similar to the race surface, since running at slightly faster than race pace needs a good surface. By this stage in the clinic the more experienced runners can usefully have a longer cool down run, so it is useful to have an alternative, longer route back to the starting point.

17.7 The Race Pace Sessions

For the short race pace sessions, Section 8.2, the clinic can use the same place as the speed repetitions. For the longer repetitions, Section 8.3, the program lead needs to find a 1K relatively flat paved path. This will allow for a 2K repetition with an out and back run, similar to what occurs in many out and back races.

After a few weeks of doing the aerobic strides, the clinic transitions to doing the race pace sessions once a week. Initially these race pace sessions will be just 300m long with a short jog recovery, and steps this up to 500m, then 1K and 2K repetitions. At peak the runners aiming for the 5K may just do 2, 2k repetitions, and the 10K runners can do up to 4, 2K repetitions.

The program lead is responsible for planning out the paces with the run leads to ensure that all the clinic participants have an appropriate pace group to run with. These sessions can be 10-30 seconds/K slower than planned race pace, so there is opportunity for grouping differing abilities. The first few weeks of the race pace sessions are used to fine tune the expected race pace. Running a slightly slower pace is better than a faster pace because when running race pace going too deep into the anaerobic energy system will mean that the pace cannot be sustained for the later repetitions.

17.8 The Time Trial

Just before the taper the program lead needs to find a paved 2K path that can be used for the pre-race time trial, Section 9.1, The path needs to be similar in profile to the race course. This time trial is set up as a race preparation session, using the same warm up and drills that will be used before the race.

This session is not paced for the participants, instead it needs to be timed with a run lead at the turnaround point calling out the split times. The easiest way to do this is to have a run lead 500m up the path watching for the start of the time trial, that way the run lead can get to the turn around point ahead of even the fastest runners in the clinic. There also needs to be a run lead at the finish calling out the finish times.

17.9 Race Day

On the race day the program lead is responsible for leading the pre-race warm up and form drills. Where possible a run lead should be positioned at the 500m point and the 2K point in the race to call out split times. This will enable the participants to better judge their pace in the race. It also allows the run leads to cheer on the participants that they have worked with over the duration of the clinic.

Either before of after the race it is good to get a group photograph of all the participants, a good time to do this can be during the warm up drills prior to the race, but after the race works as well.

17.10 Post Race Celebration

The Run To Footstock clinic does a post clinic celebration the week after the race. Typically this takes place after a 5K to 10K trail run in a park, after the post race recovery week. This allows the participants and run leads to celebrate their participation in the clinic and talk about how the race went. It is also a good time to talk about participation in future races and plans to continue training.

Chapter 18

After The Clinic

After the clinic some participants will have been bitten by the racing bug, others will decide that they enjoy running but are not that interested in racing. For those who do not want to race, then all that is needed to continue enjoying running is to continue with a weekly, easy long run and a few shorter aerobic runs during the week. That will be sufficient to maintain the aerobic fitness developed during the clinic. This chapter is written for those participants who want to improve their race times after the clinic.

18.1 Focus On Aerobic Fitness

Many runners (and their coaches) make the mistake of trying to run fast all the time in training. To develop your aerobic system to the maximum you need to ensure that you are not going anywhere near your anaerobic or alactic energy systems during the bulk of your running. This is especially true of your long runs, you need to stay fully aerobic to provide the necessary stimulus to your mitochondria.

To this end, Phil Maffetone, (Maffetone, 2010), talks about a maintaining a low heart rate during all runs, and while initially those runs will be slow, over time as aerobic fitness develops the run pace can increase at the same low heart rate. In an era when elite runners go for 20K runs at a pace of 4:40 to 5:00/K[1], when many of them can sustain a 3:00/K pace for a complete marathon, many runners try to run close to their 10K race pace during their runs. Based on the example of these elite runners, a better pace would be 2:00/K slower than race pace.

During your two hard sessions per week, remember to stay aerobic most of the time. Use short hills and strides for your power and speed development, and long hills to work your aerobic system. Use longer repetitions at race pace when you want to run fast. Only in the last four or five weeks before a race when you need to sharpen

[1]The secret to running a faster marathon? Slow Down. https://www.wired.com/2017/02/nike-two-hour-marathon-2/

up should you touch on the more anaerobic work, the speed repetitions and the anaerobic repetitions.

You should think of your anaerobic work as the icing on the cake of your aerobic development. A little bit of anaerobic training is good, but too much will take the edge off your overall aerobic fitness. Fully developing your anaerobic system takes remarkably few training sessions, so it is better to spend more time on building your aerobic base which will have a much larger effect on your race times than your ability to sprint a bit faster in the last 100m of the race.

18.2 Plan Your Racing Season

Although many runners like to race frequently, having longer periods between races allows for more training between the races so that you can improve more. After any 5K or 10K race you need to take it easy for at least a week before doing any more hard training. This is to allow your body to fully recover from the hard effort of racing. After than you need to spend another week or two gradually building your training back up to the level that it was prior to tapering for the race. So effectively every race you do puts at least a four week break into your progressive training.

So for maximum progression it is best if you only plan two key races a year when you plan on improving your race times. One race in early Summer and another in the Fall is ideal. You can still do other races, but treat those as time trials where you do not go all out for a fast time.

18.3 Other Racing Distances

Although the 5K and 10K are the most common race distances, many runners get interested in running longer races. The Half Marathon is 21.1K, a race distance that ideally should not be attempted until you have been running for more than a year and are comfortable with running 40K/Week. The Marathon at 42.2K, is a much harder challenge that should not be attempted until you have been running for several years and are comfortable with running at least 60K/Week.

You can complete a half marathon or marathon on less training, but the risks of injury are higher if you get very tired during the race and your running form deteriorates. You want to be able to finish a half or full marathon feeling strong so that you look good in your finish photos, so please make sure that you are ready for the event before starting specific training for these races. See (Humphrey et al., 2012) for reasonable training plans for the half or full marathon.

18.4 Progressing Your Training

The sessions that you have been doing in the clinic are fundamental to progressing as a runner. You need to continue with long runs, strength and race pace sessions,

and you can add in extra easy runs or cross training sessions. Three runs a week are the minimum necessary for improvement, but adding in another two or three easy, aerobic runs a week will improve your overall fitness. Alternatively you could add some aerobic cross training like cycling or swimming.

- After each race, step your hard training sessions back to the alactic work you did at the start of the clinic, strides and short hills to build speed and strength. Build your long run distances up and increase the length of your easy cool down runs. If you have time add in another one or two easy runs during the week.
- Once the alactic work has put a spring back in your stride, try to build your long runs up to 90 minutes or even two hours, but add no more than 1K/week as you want the progression to be easy. Your hard sessions can now progress to the sessions we did in the middle of the clinic, finding a hill that makes you work for up to 90 seconds. You should also do short race pace repetitions to practice your planned race pace. Keep doing the drills in your warm ups before these two harder sessions.
- Gradually transition to doing longer hills and longer race pace repetitions, while keeping up the longer weekly run and easy runs. Keep working at this level, increasing the workload as you feel your fitness building.
- The last five weeks before the race are when you do your final sharpening. Keep your long runs the same, but change your strength sessions to be speed or anaerobic repetitions, and build the length of your race pace repetitions to 2K by about 10 days before the race.
- Remember to taper your training before the race. Cut your long run distance in half the week before the race, and although you will still do your strength and race pace sessions, just do one or two repetitions after the normal warm up and drills. Yes, you will want to do more, but resist the temptation and leave the hard training sessions bouncy and wanting to do more. You want to get to the start line for your next race fully rested and ready to race.

18.5 Solo And Group Training

Some runners prefer to do their long runs and easy runs alone, enjoying the peace and solitude of solo running. Others just fit their easy runs in around their schedule and do their long runs with a group. Choose whatever works for you, just remember to get these essential aerobic runs in every week.

Few runners maintain regular strength and race pace sessions without the structure of a group session. Most runners do not succeed in keeping up regularly doing the form drills solo, and most find that doing strength and race pace sessions in a group is easier. Skipping a week or two is barely noticeable when you train solo, but if you are training in a group and you miss a week or two you will notice that everyone else in the group has progressed while you have lost a bit of fitness.

If you do join in group training sessions, remember that these are training sessions and you are supposed to keep your racing mindset for races. Yes, use your training

partners to help your run at the correct pace, but do not try to race your partners during training.

18.6 Learning More About Running

There have been many books written about running, but the key thing you have to learn about running is listening to your body. Experiment with different length warm ups and cool downs to learn what works best for you. Try different form drills to discover what works best for your body. While running, learn to monitor your pace by how you feel, not by looking at a GPS watch. Once you know how different paces feel, if you feel good in a race you can trust your body and go for a fast time.

- Record your training in a diary - part of listening to your body is being able to look back on the training you have done and how you felt while doing that training. It is much easier to do this reflection if you have a written record of what runs you did, where you went and how you felt both before, during and after the run.
- Chart your weekly distances - making your training visible will make it easier for you to learn how you respond to training. Did you find your long run harder than normal because it was longer than normal or is there a different cause.
- Skip your planned hard sessions if you are feeling tired - if you have not recovered enough to be able to start a hard session with a spring in your step, skip the session. Still do the warm up, drills and cool down, but omit the hard work in the middle. Then try to figure out why you were tired for the session, was it that the previous session was too hard, or did you push an easy run, leaving you too tired to do the hard session.

18.7 Be Patient

Running is not a sport of instant gratification. Improvement comes slowly, but even 10 years after starting training and racing you can still improve your times. Eventually you will start to slow down, but by then you will be competing in age group categories and likely be a lot fitter and faster than people a lot younger than you.

Running is not a sport that you have to retire from, it is something that you can enjoy for the rest of your life.

Bibliography

Hetlelid, K. J., Plews, D. J., Herold, E., Laursen, P. B., and Seiler, S. (2015). Rethinking the role of fat oxidation: substrate utilisation during high-intensity interval training in well-trained and recreationally trained runners. *BMJ Open Sport & Exercise Medicine*, 1(1).

Humphrey, L., Hanson, K., and Hanson, K. (2012). *Hansons Marathon Method: A Renegade Path to Your Fastest Marathon*. VeloPress, 1st edition. ISBN 978-1934030851.

Maffetone, P. (2010). *The Big Book of Endurance Training and Racing*. Skyhorse Publishing, 1st edition. ISBN 978-1616080655.

Noakes, T. (2003). *Lore of Running*. Human Kinetics, 4th edition. ISBN 978-0873229593.

Noakes, T. (2012). *Waterlogged: The Serious Problem of Overhydration in Endurance Sports*. Human Kinetics, 1st edition. ISBN 978-1450424974.

Tanaka, Hiroaki with Jackowska, M. (2016). *Slow Jogging*. Skyhorse Publishing, 1st edition. ISBN 978-1510708310.

Taubes, G. (2016). *The Case Against Sugar*. Knopf, 1st edition. ISBN 978-0307701640.

Volek, J. S. and Phinney, S. D. (2011). *The Art and Science of Low Carbohydrate Living*. Beyond Obesity LLC, 1st edition. ISBN 978-0983490708.