



12-WEEK 5K TRAINING PROGRAM

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PLEDGE



When you have a vision and you have a dream, you dig in more. It makes you focus. That's the thing about having a goal and wanting to achieve something great. You push yourself harder and do things you didn't think you could be capable of."

Mo Farah

Target time & pace:

Other goals:



Don't be afraid to dream of achieving the impossible.

Shalane Flanagan

THE IMPORTANCE OF PLANNING

For many years, elite athletes and their coaches know that the foundation of success lies in careful planning.

They achieve their goals through REVERSE ENGINEERING. That is, starting with their desired outcome in mind and then working backwards to determine what needs to be achieved on a daily and weekly basis.

Just like the world's best, you will need a carefully developed and calculated training plan to maximise your chances of hitting your target time.

“

The idea that the harder you work, the better you're going to be is just garbage. The greatest improvement is made by the man or woman who works most *intelligently*.



<https://footballfoundation.org>

- Bill Bowerman
American Track & Field Coach & Co-Founder of Nike

“

I didn't give myself enough breaks during the training year to recover. I didn't understand the power of periodization.



- **Alberto Salazar** (Coached Mo Farah & Galen Rupp)
on the topic of scheduling mesocycles throughout the year

Planning also allows you to gauge what's achievable in context of family and work-related commitments. Furthermore, it reduces your risk of overuse injury.

Sweat Elite brings together the tens of thousands of hours of training, racing and coaching experience of the world's best athletes, to form this plan to guide you to 5k success!

ROAD RHYTHMS

To achieve peak condition for a particular race(s), it's important to select your races well ahead in advance so that you can plan your training cycle carefully.

Our 12-week training schedule can be grouped into 3 main stages. Each stage has their unique emphases and objectives; however, there is overlap between stages. The stages build on top of each other such that mileage, strength and speedwork combine to produce a synergistic & multiplicative effect at just the right time.

- Stage 1: Base & Strength (Weeks 1-4)
- Stage 2: Strength & Speed (Weeks 5-10)
- Stage 3: Speed & Taper (Weeks 11-12)





Stage 1: Weeks 1-4 Base & Strength

There are two main aims in this stage:

- 1) Primary goal: Gradually build your aerobic endurance leading to physiological adaptations such as a more diverse capillary network, and increased myoglobin and mitochondrial content (see <http://www.sweatelite.co/aerobic-running/> for more details).
- 2) Secondary goal: Start to strengthen the muscles in preparation for speed sessions ahead, without delving too much into sustained anaerobic energy systems.

Here, you will notice a greater proportion of steady/recovery/tempo/long runs compared to speed work. Also, the duration of these longer runs will increase progressively throughout the 3 weeks. Essentially, you're 'banking in' more and more miles as the initial weeks pass by.

Most elite athletes focusing on the 5k event run in excess of 160km (100miles) a week. However, this is variable even among the best runners. Comparing the two most recent 5km WR titles:

- Haile Gebrselassie (12:39:36, set in 1998) averaged almost 200km (160miles) a week, while...
- Kenenisa Bekele (12:37:35, set in 2004, current WR) averaged around 100km (80miles) a week.

Naturally, such athletes train simultaneously for the 5k and 10k events within the same season, so the preparation between the two events often overlap and hence are not always mutually exclusive.

Strength-wise, your legs will learn to adjust to resistance from running on undulating hills and on moderately steep inclines. Your body learn to adapt to the routine and nature of core and leg exercises.

Here is a good reminder by legendary distance all-rounder Grete Waitz:

<https://www.iaaf.org/>



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If you are training properly, you should progress steadily...each training session should be like putting money in the bank. If your training works, you continue to deposit into your 'strength' account. [Conversely] too much training has the opposite effect. Rather than build, it tears down. Your body will tell when you have begun to tip the balance. Just be sure to listen to it.

Stage 2: Weeks 5-10 Strength & Speed

- At the beginning of Week 4, the strength training intensifies in gradient (steepness of the hills) and duration.
- Around the middle of this stage, we then introduce speedwork starting with longer intervals (around VO2 max pace).
- Towards Weeks 8-10, the speedwork becomes shorter, frequent and more intense (aka lactic repetitions).

(Note that even towards the end of this stage, there is little need to be running much faster than your goal race pace, even though you might be capable of doing a number of quick 1km reps!)

Maintain the duration of steady and recovery runs. Meanwhile, tempo and long runs may increase or decrease depending on the exact timing of the mesocycle. You will also be increasing the duration of the core and leg exercises.

Evidently, volume and intensity is much greater compared to the previous stage. Ultimately however, you will need to consider your training history in quantifying the most appropriate load for you to handle. Continue to listen to your body and show self-control to decrease risk of acute and chronic injury.

Remember, even though the 5km event is considered the 'shortest' long-distance race...aerobic metabolism is still the dominant fuel source (so try to avoid neglecting your long runs!). You can maximise the development of your aerobic capacity by training on fasted i.e. a 'carb-less' state. For these "fuel efficiency" workouts, avoid eating 2hrs before your run; only eat after.

For more insight into the rationale and physiology of the strength and speed stages, we strongly recommend that you refer to Appendix A and B of this E-book.

Stage 3: Weeks 11-12 Speed & Taper

This stage is predominantly characterised by quick and faster repetitions. The duration of the other runs begins to taper.

Tapering is the art of finding the right balance of cutting back mileage to be rested and ready while maintaining peak form. Typically, a short easy run occurs on pre-race day to stay loose and relaxed.

Concentrate on fast leg turnover, 'light' feet, peak optimal body form, maintaining good technique and feeling fresh.

There is extra emphasis on quality recovery, stretching and massage.



TYPES OF TRAINING SESSIONS

The following sessions are incorporated throughout the three stages. Here we detail what you need to know about the specific sessions:

Long Runs

Focus on developing your endurance and aerobic system (see above). The pace requires more effort than an easy run and is similar to a steady run (@ RPE 5). Hypothetically, it would be moderately difficult to sustain conversations on a long run.

Steady Runs

Comfortable-to-moderate effort runs. The pace is approximately equal to that of a long run (@ RPE 4-5), except shorter in duration. These will help to continue building the body's aerobic fitness and functional strength.

Conduct these on undulating (rolling) hills. Hills serve as natural resistance to strengthen your legs. These rolling hills will also enable your heart rate to rise and fall at lower speeds.

This forms the key component of strength training at St Patrick's (David Rudisha's training group in Iten, Kenya). Here the terrain is often very challenging, and the altitude is 2300-2500m (7500-7800ft). The group incorporates hills into their daily runs (except for track workouts), including warm ups and cool downs.

Tempo Runs

These sessions help to build your anaerobic (lactate) threshold which is super important for long-distance running at a fast pace.

Basically, this refers to the exercise intensity at which lactate blood levels begin to exponentially increase. This occurs when the pace is too fast such that the aerobic system can no longer keep up with the body's rate of energy demand. Therefore, the anaerobic system starts to kick in, leading to the exponential build of waste by-product.

Tempo runs are performed at a pace which is the 'sweet spot' between the aerobic/anaerobic transition points. It is difficult to talk and is generally at RPE 7. Doing this regularly will help the body to push that threshold further so you can run at your target 5k pace more 'comfortably'.

These tempo runs alternate between continuous runs and repetitions each week. Take 2min standing recovery between the tempo reps. Ideal surfaces are flat trails or roads.

Fartleks

The Kenyans dominate these sessions. The sessions involve alternating between surges (fast runs) and floats (easy runs). This will develop your ability to discern between different paces which is important during speedwork, as well as having the discipline to run exactly at your target pace on race day.

At the elite level, the fast runs are treated more like an extended surge, while the easy runs more closely resemble a steady run.

Hill Repeats

Find a place where there is a consistently moderate incline which stretches out for at least 500m or so. Hard effort uphill, easy jog downhill.

In addition to its strength-related benefits, the hills also encourage correct running posture and form. Watch out for good technique including: head up, shoulders relaxed, hips up, knees up, running on the front half of your foot in

a ratio of 60:40. Your arms should be driving your knee drive. Where possible, try to remain relaxed as the fatigue mounts up.

If you like, you may vary up these hill sessions with some steep hill running, hill bounding or hill springing. The physiology of strength development via hill repeats is available at <http://www.sweatelite.co/lydiard-fundamentals-part-3-hill-resistance-training/> and is also supplied in the appendix.

This session stimulates the stress-recovery response so it's necessary to make sure you take it super easy the next day.

Speedwork: Intervals

Designed to expose your circulatory and aerobic systems to high levels of systemic (i.e. whole body) acidosis which is inevitably encountered in race situation. Such exposure stimulates the body to create greater chemical buffers against the acidosis, training you to tolerate and get used to the acidosis as long as possible during the real deal.

These sessions are often completed at 5k goal pace @ RPE 8-9. Try to have all repetitions completed at a consistent time (i.e. within 3-4 seconds of each other). With experience, you will get better at judging the required effort or pace.

These should be accompanied with a thorough warm-up and warm-down routine (see below). The ideal surface is a grass, followed by a synthetic track. Roads or flat trails are alternative options.





Speedwork: Glycolytic (lactic) Repetitions

The shorter, snappier and more intense cousin of intervals. This is designed to get your legs used to extreme fatigue from local (i.e. confined to the legs) acidosis. It is important not to exhaust this system on back-to-back days. Doing so will come the expense of significant aerobic capacity, as it may recruit destructive enzymes that can rupture your cell membranes resulting in protein leakage and capillary damage.

These sessions are often completed at 3k goal pace @ RPE 9-10.

Recovery Runs

Very easy running! Note that this is different to total rest*: easy running stimulates the gentle flow of blood toxins to the liver, eliminating the acidosis and restoring the body to 'neutral'. Failure to remove any mounting and prolonged acidosis will otherwise damage your body's enzymes, muscles and red blood cells.

(*Rest is also critical to your recovery and injury prevention efforts, so don't ignore rest days. Here muscles are repairing microtears and building them to be stronger – i.e. stress-induced regeneration.)

Strength Training

Here we are referring to functional strength training, instead of very heavy weight sessions. They include light weights and plyometric activities for the core and leg muscles. Aim for 2-3 sessions per week, building up the intensity and repetitions until weeks 8-10.

Coach Alberto Salazar and physical therapist David McHenry assigns 3 sessions per week to Oregon Project's elite athletes including Mo Farah and Galen Rupp. These include medicine ball lunges, runner pulls, side planks, clamshells, mountain climbers, etc.

Elite members of the Melbourne Track Club perform strength training almost every day, including core stability which is performed over 2-4 times a week.

Physiotherapist-recommended hip stability exercises include single leg bridges, fire-hydrants, hip external rotations & sit-to-stands. To strengthen lower-limb tendons, perform 50 single-leg calf raises on each side, daily. [1]

Benefits of these sessions include injury prevention, enhancing strength and power, improvements in running technique.

Cross-Training (CT)

CT allows sufficient rest to muscles, joints, bones while allowing you to maintain and continue developing your aerobic fitness. Hence, this is perfect after Sunday's long run. Swimming, biking, or using ellipticals at a moderate intensity level is ideal.





OTHER CONSIDERATIONS & TIPS

Warm-Up & Warm-Down Routine

Perform these around the following sessions: Intervals, Hill Repeats, Fartleks and Tempo Runs.

Warm up includes:

- ✓ 10mins easy run
- ✓ Dynamic (not static) stretching
- ✓ Drills – fosters muscle memory for good running technique. This enables efficiency and prevents injury. Especially important in 5-10k races characterised by high-impact workouts that otherwise makes runners prone to injury.
- ✓ Run throughs (aka strides) - 50-80m at a fast pace. Focus on light feet, good technique, posture and high turnover.

Warm down includes:

- ✓ 5 mins easy run
- ✓ Static stretching - helps you stay flexible and prevent muscle-related injuries.

Rated Perceived Exertion (RPE) Scale for Judging Effort and Pace

RPE Scale	Running Activity	Talking	% of Max Heart Rate
0 Nothing			40-45%
1 Very Easy			
2 Easy			46-55%
3 Moderate	Recovery Run	Converse with almost no effort	
4 Somewhat Hard		Converse with a little more effort	56-75%
5 Hard	Long or Steady Run	Conversation requires effort	
6	Tempo Run	Conversation is difficult and requires a lot of effort	
7 Very Hard	Tempo Run		76-85%
8	Interval Session or Race Pace	Very difficult conversation and requires maximal effort	
9	Interval Session or Race Pace	Conversation not possible, requires full effort	86-100%
10 Maximal	Sprint		

Technique

Optimise your running economy (aka efficiency) to preserve energy especially for the back end of the race. Consider the following:

- ✓ Low upper arms with bent elbows slightly less than 90°
- ✓ Light feet especially during easy and long runs
- ✓ Not rocking shoulders
- ✓ Avoiding excessive heel or forefoot striking
- ✓ Good posture and knee lift especially during hills
- ✓ Etc.

Incorporating drills into your warm up is an effective way to develop muscle memory for good running technique.

Recovery

Massage, compression and other recovery activities are especially crucial in the strength & speed phases. Molly Huddle prioritises an ice bath, nutrition foam roll and massage after each tough workout. Galen Rupp recognises the importance of recovery in preparing for the next race ahead. He says, "I'm just going to be focused on recovery—a lot of ice baths, massage, stretching, and all that stuff and getting ready to have another race."

<https://www.runnersworld.com>



Keep a Running Journal

Helps you track progress, inspire new goals and prevent reoccurrence of past mistakes. Can be simple to more detailed. Remember, evaluated experience is the best teacher.

Surface

Avoid hard surfaces e.g. concrete sidewalks; aim for grass or dirt trails which absorb more force from your legs. This will help prevent injury.

Alberto Salazar (Mo Farah's coach) says that "pavement damages joints, tendons, ligaments, and muscles. The more you can run on grass, woodchips, or dirt, the better of you are. My athletes run 90 percent of their workouts on soft surfaces."

Shoes

Rotate between 2 pairs of well-fitted running shoes. In your selection, consider factors such as pronation/neutral/supination during mid stance, terrains, toe-box width, heel pitch/drop, etc. with the assistance of a podiatrist.





Pre-Race Day Nutrition Plan

This is quite diverse among elite athletes but here are some examples for inspiration:

Kenyans are famous for their whole food plant-based diet. Most athletes rarely eat meat more than once a fortnight. Common staples include Ugali, Managu, Cabbage, Beans, Bread, Rice, Eggs, Bananas, Millet, Water and lots of Chai (for more details see <http://www.sweatelite.co/famous-kenyan-diet-veggies-no-rubbish/>).

Note that affordability plays an important factor for this simple eating lifestyle, but the Kenyans also claim it's one of their secret weapons.

Mo Farah loves bananas and his carbs. He loads up on pasta, chicken, rice and vegetables on pre-race day.

German athlete Hendrik Pfeiffer takes a more general approach – his main principle is doing what feels right for his body.

Do NOT try anything new in the week prior to race day – this includes gels, hydration drinks, powders, supplements and meals.

POST-RACE RECOVERY

Recovery is important after a major season or race!

The duration can vary and is influenced by many things including when your next race is. However, the average tends to be 19 days when we surveyed 10 elite male and female athletes.

We can see from the world's best runners:

- ✓ David Rudisha: 6-12 weeks
- ✓ Mo Farah: 4 weeks
- ✓ Galen Rupp: 4 weeks
- ✓ Bernard Lagat: 5 weeks
- ✓ Steve Ovett: 4-5 weeks
- ✓ Usain Bolt: 4-8 weeks

What happens during the rest phase? Athletes in Kenya (& the rest of Africa) would enjoy FULL REST while other athletes might do light jogs a few times each week. Cross-training (e.g. swimming, cycling) is another option.

Anyway, the main idea is that there should be some kind of rest period after a major competition.

Following this, you are ready to start a fresh cycle again.

References

[1] <https://www.pogophysio.com.au/blog/running-hip-stability-and-strength-exercises/>

ELITE ATHLETE-INSPIRED 12-WEEK TRAINING SCHEDULE

STAGE 2: WEEKS 5-10 STRENGTH & SPEED



WEEK

	MON	TUE	WED	THUR	FRI	SAT	SUN
<p>5 New stage! Tougher load weeks are coming ahead.</p> <p>6 Start of some longer interval sessions</p> <p>7</p> <p>8 Easier Week</p>	<p>1) CT (or REST) 2) strength 30mins</p> <p>"Recovery is the hardest part of training for me." Ryan Hall</p>	<p>6 x 3min hill repeats, bounding near the end</p> <p>"The will to win means nothing without the will to prepare." Juma Ikangaa</p>	<p>1) Steady run 50 mins 2) strength 30mins</p> <p>"When aerobic running becomes a daily habit, strength & confidence follow" Arthur Lydiard</p>	<p>6 x 90s steeper hill repeats, springing near the end</p> <p>"Many people shy away from hills...[but] the more you repeat something, the stronger you get." — Joe Catalano</p>	<p>40min recovery run (or REST)</p> <p>Good body posture. Leading into tomorrow's run – keep it easy</p>	<p>20, 15min tempo (total 35min) 10-15k race pace</p> <p>The weekends are becoming heavy with load!</p>	<p>Long run 60mins</p> <p>"When it's pouring rain and you're bowling along through the wet, there's satisfaction in knowing you're out there and the others aren't." — Peter Snell</p>
	<p>1) CT (or REST) 2) strength 30mins</p> <p>Great day for massage & stretching</p>	<p>2 x 2.5km @ 10k race pace. 90s walking recovery.</p> <p>"To give anything less than your best is to sacrifice the gift." Steve Prefontaine</p>	<p>1) Undulating hills steady run 55 mins 2) strength 30mins</p> <p>Keep relaxed; off road is best</p>	<p>3 sets of -400m uphill springing/bounding -400m flat recovery jog -400m downhill fast relaxed striding -400m leg speed runs</p> <p>(Adaptation of Lydiard's original hill circuit in Blockhouse Bay)</p>	<p>1) 45min recovery run (or REST) 2) Short relaxed strides</p> <p>"Never set limits, go after your dreams, don't be afraid to push the boundaries. And laugh a lot – it's good for you!" Paula Radcliffe</p>	<p>3 x 12min tempo (total 36min) undulating hills 10k race pace</p> <p>"All athletes need three things: commitment, discipline and hard work. Without that it's hard to keep running." — Haile Gebrselassie</p>	<p>Long run 65mins</p> <p>"I didn't achieve it overnight. It has been the product of many years' struggle, and every year, I've improved as an athlete a little bit more." — Mo Farah</p>
	<p>1) CT (or REST) 2) strength 30mins</p> <p>"Progression is best made by increasing repetitions, rather than increasing the weight/load." Seb Coe</p>	<p>3 x 2 km @ 10k race pace. 90s walking recovery. RPE 7</p> <p>A common session among elites (e.g. Melbourne Track Club) and recreational runners.</p>	<p>1) Fuel efficiency steady run 60 mins 2) strength 30mins</p> <p>Continuing to add miles in the bank!</p>	<p>Short steep hill springing 20 x 30s jog easy down. (Exception: walk after 10th)</p> <p>"Don't dream of winning, train for it!" Mo Farah</p>	<p>1) 50min recovery run (or REST) 2) Short relaxed strides</p> <p>Easy runs are important to eliminate the acidosis from your body.</p>	<p>2x20min tempo 10k race pace</p> <p>"[If] you put in the work, you run the race, the clock tells you exactly how good you are...you're rewarded."</p>	<p>Long run 70mins</p> <p>"Running is my private time, my therapy, my religion." Gail W. Kislewitz</p>
	<p>REST</p> <p>"Recovery, to me, means sleeping and eating well. If I'm not feeling recovered, I'll sleep and eat more, and that usually does the trick." Shalane Flanagan</p>	<p>2 x 2km @ 10k pace 2 x 1km @ 5k pace 75s walking recovery.</p> <p>"The more confident you are in your training, the less nervous you'll be on race day." Shalane Flanagan</p>	<p>1) Recovery run 40mins 2) strength 30mins</p> <p>Active recovery session</p>	<p>Undulating hills steady run 50mins</p> <p>Focus on not rocking the arms</p>	<p>REST</p> <p>Good day for massage</p>	<p>Fuel efficiency steady run 35 mins</p> <p>Focus on knee lift</p>	<p>Long run 60 mins</p> <p>Finishing off the week feeling fresh</p>



WEEK

<p>9 Building up to a challenge...</p>	<p>1) CT (or REST) 2) strength 30mins "It's so important to listen to your body" Paula Radcliffe</p>	<p>4 x 1.5km @ 5k race pace. 75s walking recovery. RPE 8-9 Work on leg speed</p>	<p>1) Steady run 55 mins 2) strength 30mins Steady runs are great for focusing on technique</p>	<p>8 x 90s steeper hill repeats, springing near the end Work on that knee drive</p>	<p>1) 45min recovery run (or REST) 2) strength 30mins Getting the mind ready for tomorrow's session.</p>	<p>15, 10, 10, 5, 5min tempo (40min total) 5-10k race pace Good body posture</p>	<p>Long run 70mins Volume is important!</p>
	<p>10 Peak Week!</p>	<p>1) CT (or REST) 2) strength 30mins "Passion is a choice. You need to choose to be great. It's not a chance, it's a choice." Eliud Kipchoge</p>	<p>6 x 1km @ 5k race pace. 60s walking recovery. The Kenyan Motto: Train Hard, Win Easy</p>	<p>1) Steady run 60 mins 2) strength 30mins "All runners are tough. Everyone has to have a little fire in them, that even in tough times, can't be turned off." Shalane Flanagan</p>	<p>6 x 800m @ 5k race pace, (400 float jog per rep) Feeling very strong</p>	<p>1) 50min recovery run (or REST) 2) strength 30mins Even as an elite athlete, Joyciline Jepkosgei's easy runs are done at 5-6mins/km</p>	<p>Fartlek pyramids 1/2/3/4/5/4/3/2/1 mins (1/2/3/3/3/3/2/1 mins recovery jog) 5-10k race pace Feeling light on the feet</p>

STAGE 3: WEEKS 11-12 SPEED & TAPER



WEEK

<p>11 Beginning the taper while maintaining speed</p>	<p>1) REST 2) strength 20mins "The taper tantrums are real." Shalane Flanagan</p>	<p>Kenenisa Bekele-inspired interval session: 8 x [400m, rest, 200m, rest] @ 3k race pace 90s walking recovery. Focus on not overstriding</p>	<p>1) 40min recovery run (or REST) 2) strength 20mins Easy runs are a time to chat with friends - develop a running culture and community where you live. Be like the Kenyans of Rift Valley</p>	<p>4 x 800m @ 3-5k race pace. 60s walking recovery. RPE 8-9 Feeling strong and controlled</p>	<p>40min recovery run (or REST) Feeling light on the feet</p>	<p>Steady run 35 mins Feeling good going into tomorrow's long run</p>	<p>Long run 60mins Finishing off the week feeling fresh</p>
	<p>12 Final week!</p>	<p>1) CT (or REST) 2) strength 20mins "The marathon is my only girlfriend. I give her everything I have." - Toshihiko Seko</p>	<p>6 x 400m @ 5k race pace (400 recovery jog per rep) Eliud Kipchoge & Ryan Hall's final speed session</p>	<p>1) REST 2) Light stretching Allowing yourself the day to recover from the track session</p>	<p>REST Make sure you are following your pre-determined nutrition plan and race strategy!</p>	<p>20mins very light recovery run Feeling in control</p>	<p>RACE WEEKEND "Victory is in having done your best. If you've done your best, you've won." — Bill Bowerman</p>

APPENDIX A

Lydiard's Principles on Hill Resistance Training

Introduction

The hill resistance phase follows the base phase and typically lasts for 4 weeks. Lydiard considers this as the 'transition' between aerobic (base phase) and anaerobic (speed phase) work.

Purpose

The main focus is to strengthen the muscles (especially the Type IIB fast-twitch alactic fibres) in preparation for the track sessions ahead, without delving into sustained anaerobic energy systems.

Physiology

During muscle contraction, the nervous system will usually fire off muscle fibres in order of increasing 'motor unit' size. Slow-twitch fibres have the smallest motor units, followed by Type IIA glycolytic fibres then finally Type IIB alactic fibres, provided there is a huge incoming electromotive charge.

So the problem is this: if a runner sticks only to aerobic sessions for the entire preparation, he will not adequately strengthen the Type IIA and IIB muscles that gives you the extra advantage in distance races.

Fortunately, the solution lies in running uphill. This induces plyometric contraction whereby the plantar flexors concentrically contracts, while eccentrically stretches from the landing force. This preferentially stimulates recruitment of the Type IIB fast-twitch alactic fibres over the other fibres.

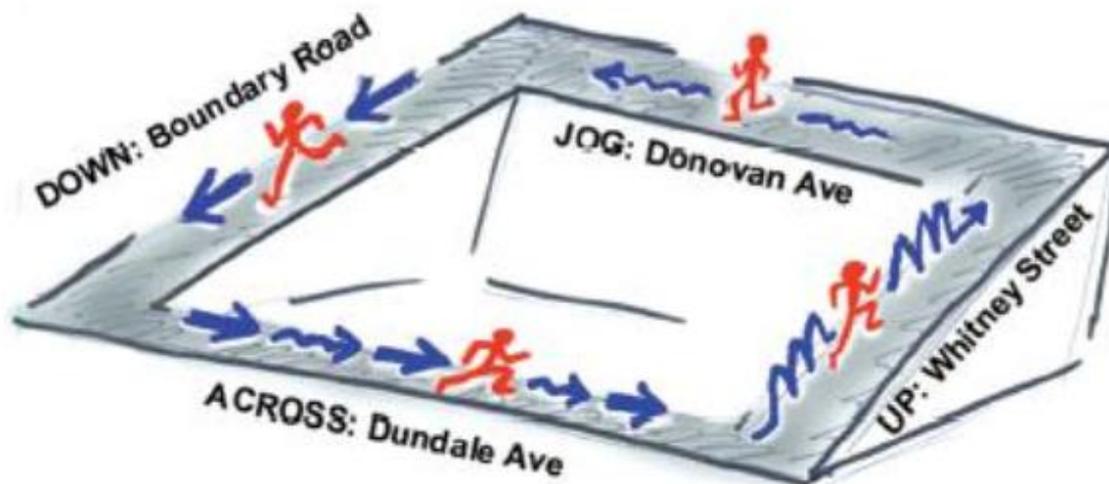
What should a typical weekly schedule look like during this phase?

Lydiard recommends that this training should be done three days weekly with alternating days being dedicated towards recovery runs. While mileage isn't the main emphasis in this phase, you should continue your weekly long runs.

There are several hills to choose from, which one is the best for my training?

An excerpt from Keith Livingstone's "Highly Intelligent Training: The Proven Principles of Arthur Lydiard". The original "Hill Circuit" was a loop of 1.9 miles:

- An 800m long uphill for springing and bounding up,
- 800m flat on the top for a recovery jog,
- 700m downhill for fast relaxed striding,
- With another 800m flat at the bottom where they did some wind sprints (leg speed runs), or easy repetitions (see below).



The Original Lydiard Hill Circuit: Blockhouse Bay, Auckland

Obviously, your local hill isn't going to be a perfect replica of Auckland's Blockhouse Bay. The key idea is to perform the uphill runs, jogs on the flat, fast leg turnover downhill and sprints at the bottom in their respective order.



What are the types of 'uphill running'?

Steep Hill Running

Run up a steep hill, concentrating on good posture and exaggerated knee lift. Try not to let your feet drag. It might be tempting to run up the hill as fast as you can, but try to slow your forward progression. This is because the slower your momentum, the more you can leverage your bodyweight as resistance.

Hill Bounding

Long bounding strides similar to the movements of triple jumpers. Focus on straightening your rear leg. Realistically, this is performed over shorter distances (100-200m). This exercise allows much greater forward progression compared to the other two.

Hill Springing

This helps to strengthen your ankles and increase their flexibility, thus increasing speed. As Lydiard says, "Increase in speed comes from flicking of the ankles," Lydiard said. "If you want speed, you don't need to be like a body-builder. You need to be like a ballet dancer, with springy and bouncy ankles." This is similar to bounding; however you are focusing on vertical lift rather than covering the ground horizontally.

How exactly should I approach these sessions?

The entire duration should total approximately 1 hour and consist of the following:

Always begin with a 10-15 minute warm-up.

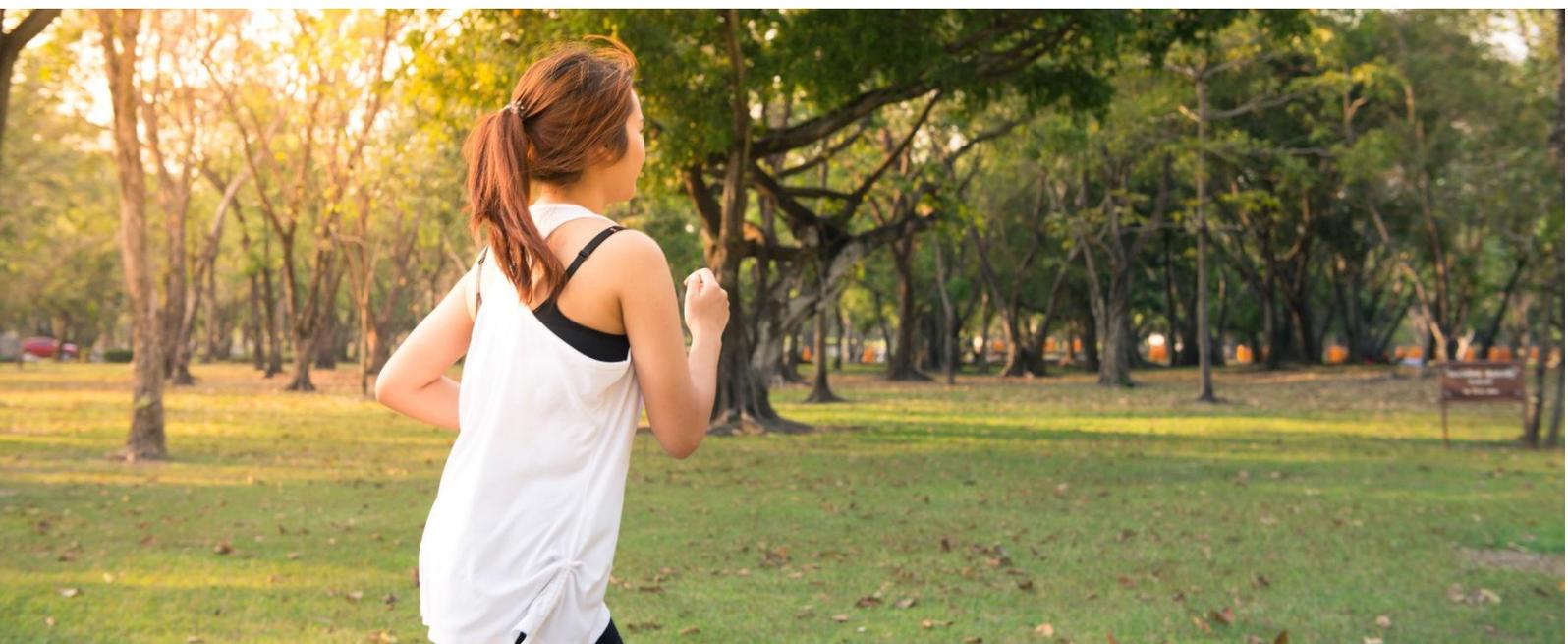
Start by running uphill, choosing one of the 3 types of uphill running as mentioned above. Keep the upper body relaxed with the head up and your arms moving comfortably. Do not look down at the ground, which tends to throw the hips back by making your body lean too far forward.

At the top of the hill jog easily for approximately three minutes.

Then run downhill with a fast relaxed striding action. This will help you develop leg-speed and also stretch leg muscles for better stride length. Think of moving the legs as fast as possible and do not be conscious of stride length. The downhill section should be such that it allows the runner to stride down fast without fear of losing control and falling. Avoid leaning backwards. If you find the hill too steep for this exercise, run down at an easy pace to avoid injury.

Complete sprint repetitions at the base of the hill so that you gradually accustom your body to exercise anaerobically. Vary the distances from 50 to 400 meters with each circuit. Repeat the circuit for multiple repetitions with 3 minutes rest intervals between repetitions.

Warm down for about 10 minutes.



Some other tips:

- Ease into your first few hill sessions which should consist of longer and steadier repetitions. Then gradually build your way to shorter and more intensive reps in the next few weeks.
- If your legs are tired, replace a hill workout with a recovery run.

References

Livingston, K. (2008). *Healthy Intelligent Training: The Proven Principles of Arthur Lydiard*: Meyer & Meyer Sport, Limited.

Lydiard, A. (1999). *Arthur Lydiard's Athletic Training by Arthur Lydiard: A Guide to the Brooks / American Track & Field Lydiard Running Lecture Tour in 1999*. Retrieved from

http://www.fitnesssports.com/lyd_clinic_guide/Arthur%20Lydiard.pdf

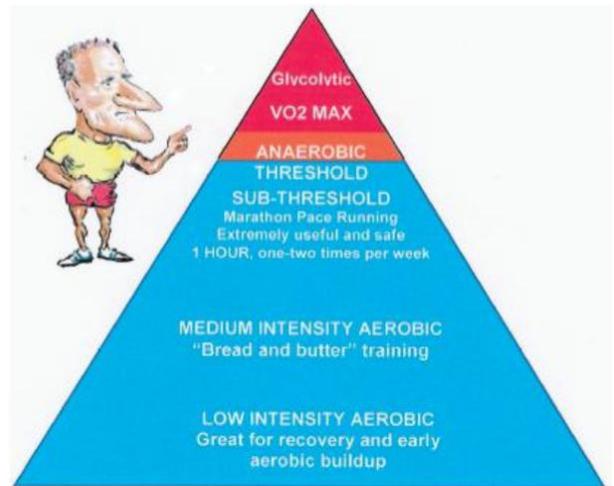
APPENDIX B

Lydiard's Principles on Anerobic Workouts

Introduction

This is the final phase leading up to your first competition of the season. It can be divided into 4 sub-phases:

1. VO₂ max intervals
2. Glycolytic (lactic) repetitions
3. Peaking
4. Freshening



Source: Livingston, K. (2008). Healthy Intelligent Training: The Proven Principles of Arthur Lydiard: Meyer & Meyer Sport, Limited.

By now:

- Your aerobic energy systems (blue) involving your slow-twitch fibres and cardiovascular system should have been developed to its maximum potential within the given timeframe;
- The work capacity of your fast-twitch fibres (both Types IIA and IIB) have been increased via hill work and fartlek work;
- You've also developed fine speed via leg-drills and short sub 10-second sprints throughout the year.

Given that the layers of the training pyramid have been built to the level of the anaerobic threshold, now it's time to lay down the (red) icing on the cake: to increase the capacity and power of your anaerobic energy system. A trained athlete only requires 4-5 weeks to develop this system to its physiological maximum.

Remember, anaerobic capacity is notoriously limited regardless of whether you're an elite athlete or a couch potato. It doesn't matter how much you train, the highest oxygen debt you can attain (in terms of its absolute amount) is 15-18L. Depending on the distance, you can choose to exhaust this within a few minutes in an 800m race, or spread it over hours in a marathon.

#1: VO₂ MAX INTERVALS

Workout specifics: Intervals around 800m-1000m or 2-5mins @ 95% VO₂ max pace, with approximately equal recovery.

Purpose: By performing tiring work for a prolonged duration, you are forcing your circulatory and aerobic systems to work to their maximum while gradually exposing them to high levels of acidosis. You want to reduce your systemic body pH as low as possible, but not too quickly such that the local acidosis in your legs stop you from running altogether. This stimulates the body to create greater chemical buffers against the acidosis, training you to tolerate the acidosis as long as possible when racing.

A word of caution: Avoid shorter and harder sprints during this sub-phase because your legs will drown in local acidosis. This will force you to stop the exercise, way before inducing the desired systemic response! Not good.

Note that 95% VO₂ max pace is virtually as effective in reaping the benefits (without incurring the associated dangers) of a true VO₂ max workout. Your VO₂ max pace is essentially what you can hold for 8-10minutes of very hard running.



#2: GLYCOLYTIC (LACTATE) REPETITIONS

This is the pinnacle of the training pyramid, the final weeks leading up to race day.

Workout specifics: Short, hard and fast repetitions @ 800m-1500m pace, with much longer recoveries.

Purpose: Unlike VO_2 max training (which aims to get your body used to systemic acidosis), the goal of this workout is to get a middle distance runner's legs used to extreme fatigue from local acidosis. Here, your body builds up acid waste much faster than it is able to be eliminated. (If you are focusing on longer distances, do not undertake these sessions as they come at the cost of significant aerobic capacity.)

A word of caution: Do not exhaust this system on a daily basis. Doing so will rupture your cell membranes resulting in protein leakage, and stimulate destructive enzymes to damage other tissues. Also, it is not necessary for your training to be faster than your goal 1500m or 800m pace.

For both types of anaerobic sessions, alternate days should be dedicated to lower intensity runs (anaerobic thresholds, sub-thresholds, recoveries).

#3 PEAKING (AKA 'SHARPENING')

Purpose: To manage all the energy systems that you've so far developed, with the ultimate goal of consistent peak performance (as opposed to erratic results) throughout your competitions. Typically you are preparing for 'the big race' accompanied by less crucial races in the preceding weeks.

Example of a typical week:

- Monday: Race-pace specific glycolytic repetitions with low overall volume.
- Tuesday: A time trial similar or slightly lower to the competition distance. E.g. if you're racing 5km & 10km, do a 5km TT. If you're doing 800m, then a 600m TT. This will prevent the accumulation of larger oxygen debts that would otherwise prolong the recovery process. These time trials will help identify weaknesses in your form.
- Wednesday: Alactic sprint training followed by aerobic recovery run. Beneficial for both long and middle-distance runners.
- Thursday: General aerobic runs or self-created training based on information you gathered from Tuesday's TT.
- Friday: Alactic sprint training followed by aerobic recovery run. Beneficial for both long and middle-distance runners.
- Saturday: Competition day aka 'practice' or 'development' races. Especially applicable for middle distance runners. These races could be decided based on the data from your Tuesday TTs.
- Sunday: A long run at a much slower pace than during base phase. Stimulate recovery back to a highly aerobic and mildly alkali state.

#4 FRESHENING UP

Purpose: This last phase of approximately 1.5 weeks focuses on reducing your training so as to build up your reserves mentally and physically for the coming

important competition. Some call this the "Super Compensation" or "Tapering" phase.

Workout specifics: Daily but very light. Anaerobic sessions should be very low in volume, longer runs very easy pace.

SOME COMMON MYTHS

Myth 1: anaerobic training = speed training

In an interview at age 86, Lydiard said:

"[While] repetitions or interval training can improve your speed to a certain degree...the actual fact is...[that they] are used for anaerobic development [whereby the purpose is to create a] huge oxygen debt to develop a buffer against this type of fatigue. Problem is that when you do that, you invariably tighten up. You cannot develop fine speed when you tighten up."

"Instead, the best way to develop speed is to use some of the American sprint drills. You should be fresh and relaxed when developing speed, not fatigued. But bear in mind, there's a time for repetitions to develop anaerobic development and there's a time for sprint drills to develop fine speed. You have to organize all types of training...at the right time so you can peak on the day."

Recommended ways to develop speed throughout the year include fartlek bursts, sprint drills, striding and bounding up hills.

Myth 2: I need to do lots of interval sessions to prepare well

Actually, the harder you run, the more aerobic recovery work (i.e. very low intensity runs) is needed. This stimulates the gentle flow of blood toxins to the liver, eliminating the acidosis and restoring the body to 'neutral'. This is also why slow running is better than total rest. Failure to remove any

mounting and prolonged acidosis will damage your body's enzymes, muscles and red blood cells. It can also depress your nervous system, including your coordination.

The younger the athletes, the less anaerobic training should be used in the schedule; and the ratio of anaerobic to aerobic training only increases as the athletes get older and fitter.

For example, the Kenyan athletes will do 3-4 aerobic sessions for every anaerobic session during a racing season. Anaerobic workouts, done 2-3 times weekly, is more than sufficient. Never do hard anaerobic training on consecutive days.

On the other hand, alactic exercise (speed drills and short sprints with very long recoveries) is safe to perform frequently as it uses the creatine phosphate substrate, not glycogen.

References

Livingston, K. (2008). *Healthy Intelligent Training: The Proven Principles of Arthur Lydiard*: Meyer & Meyer Sport, Limited.

Lydiard, A. (1999). *Arthur Lydiard's Athletic Training by Arthur Lydiard: A Guide to the Brooks / American Track & Field Lydiard Running Lecture Tour in 1999*. Retrieved from http://www.fitnesssports.com/lyd_clinic_guide/Arthur%20Lydiard.pdf

