What I have learned about running that I think is worth knowing

Axel Sarlin
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Introduction

Running is supposedly the “simplest sport in the world” and at its core it’s just about moving forward with your own legs. However the last decade or so has seen an incredible boom and now everyone starts running. Races sell out at record speed, and beginners buy lots of expensive gear before actually running. Everyone needs a vast shoe rotation and hydration vests, and every company is starting a run club with free breakfast. Everyone wants to run a sub 3 marathon, run double threshold and push 120 grams of carbs per hour. As a beginner this must be very confusing, and makes running seem like a very complicated and expensive activity, which I don’t think it has to be. In this text I aim to go through what I think is worth knowing about running, from the very basics to some more nerdy stuff, but with a realistic perspective of what actually works and what is right for your level of ambition.

About me

I started running in 2019 as an adult beginner, and since then my running has been through various phases. I’ve had periods with only slow easy paces, run a lot in the forest, run a lot of hills, run a lot of flat roads, gotten cramps in races, hit the wall in marathons and slowly built a sense of what I like and what works for me. Around 2023 I was hooked on taking running seriously, and here you can get the short version, a summary of what I’ve learned from my own training and all the books, interviews and other media I’ve gone through.

As a beginner I was very proud of getting under 25 minutes in the 5 km and thought the marathon distance seemed absurd. Now I’ve ran 5 km in 19:42 and done races that are twice the distance of a marathon. My race times obviously don’t matter to anyone else but me, but the point of this is that training works. You get faster and more fit from training, and if you read this document I hope you can see that the principles are relatively simple.

For the last year and a bit I have written weekly training programs for my wife Natalie. Among other things, she finished 3rd in Ursvik ultra (75 km, the oldest still running ultra marathon in Sweden), 2nd in Sollentuna winter half marathon (on ice) and 2nd in a local trail race. She has improved her 10k time by 2 minutes from 44:41 to 42:41, and her time in Lidingöloppet (a really popular and quite hilly race) from 2:44 down to 2:27. I’ve also helped my mother become a marathon and ultramarathon runner at the tender age of 65.

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Practicalities

Gear

People often say that you only need shoes to run, and while that is true, there is a benefit to having some other gear as well. (Actually you don't even need shoes - Abebe Bikila won the olympic marathon in 1960 barefoot, but for most people and situations shoes are a good idea.) When running, you move and get sweaty, and that's why people usually run in airy, lightweight clothes that fits well without chafing, and sometimes you also need other types of gear. This is not a shopping list of things that you have to buy, but just some things that can be good to know about.

Clothes

For most of the year in most places, you can run in shorts and a t-shirt. Synthetic materials or wool are usually a bit more comfortable than cotton and don't get as heavy when you sweat. Many people including me like running in a singlet (aka vest or a tank top) since it provides cooling airflow and freedom of movement. When it comes to your legs, it's a matter of preference between loose trousers/shorts and tights. I like short tights for longer runs since they don't chafe and rub so much, but this depends on your body shape. For shorter, faster runs I prefer wearing short shorts.

Examples: longsleeve shirt, t-shirt, singlet





Examples: shorts, short tights, long tights





When the weather provides a bit more rain and wind, it can be nice with a long sleeved shirt, a thin wind jacket, gloves, hat and other items suitable for the conditions. How much you need to dress up for different conditions is a bit of an art form and something you need to

learn. Many beginners wear too much clothing when it's a bit cold, and end up overheating and sweating which ironically makes you feel even colder. I like to think that you should dress for around 10 degrees warmer than if you were just going out for a walk, and aim to be a little cold in the beginning of the run so that you are comfortable for the majority of the run, rather than dressing for the first minute and then spending the rest of the run overheating.

As with anything, there are waves of fashion in running clothes. The last couple of years for instance, it's been popular to be nonchalant and wear bulky cotton shirts instead of something more practical, and amongst the hyrox/crossfit crowd it's common to wear shorts on top of long tights, which I think looks ridiculous. Meanwhile some people refuse to wear black shoes because they feel slower. Anyone is free to do whatever they want, and this extends to other decisions such as whether you want to wear pants under your tights or have shorts with a liner in them or not.

Shoes

Running shoes is a big industry and especially nowadays a very crowded market of different models and concepts. Generally the hot trends are making shoes lighter, bouncier and more cushioned, all at the same time. There are many good models to choose from and I'm not going to recommend any specific ones, as it depends on your preferences (and it will also be outdated as soon as a replacement model is released). I recommend trying the shoes on in a store where you can test them on a treadmill, or at least testing them on your gym treadmill before committing to wearing them outdoors.

A comment about sizes: some people have firm ideas of what size they should have and refuse to size up or down even when the actual shoe is too small or too big. Sizing is variable between brands and models, and it's more important that the shoe actually fits than the box having the right number on it. When running, especially if you run far, having extra space is good as the feet swell.

The most important thing is that the shoes feel good to run in, but to navigate the store it can be good to know roughly what you'll be looking at. Some types of shoes you can encounter include the following (the borders between the categories are not always clear-cut):

- **Daily trainers**, ordinary shoes without any special features. There are thinner, thicker, lighter, heavier, bouncier and more old school models available. If you only have one pair, it should be daily trainers.

- **Racing shoes** or super shoes: expensive, lightweight, bouncy. Not very durable. If you train a lot and want to run a fast race it can be fun to do it in a really fast shoe. They often have stiffening components (such as a carbon fibre plate) to make it more efficient, and since they are not as durable (and a bit strange to run in) you should save them for races and fast workouts.

- **Tempo shoes, super trainers etc** - somewhere in between the previous two categories. Fast shoes that are more durable and not as extreme.

- **Trail shoes** - shoes with extra grip for paths and mountains. There is a wide range from “door to trail” shoes and very hardcore orienteering shoes. I don’t think they are necessary to run on trails (if you encounter a tricky section you can always walk) but if you do it a lot and feel like you want the best possible grip, you should consider it.

- **Barefoot shoes**: shoes with minimal cushioning that are close to being barefoot. Require a lot of strength from your feet. I enjoy walking in them (it makes your feet stronger) but I avoid running in them as I’m not that hardcore.

- **Track spikes**: thin shoes with spikes that elite runners use on running tracks (due to rules). Not very comfortable or relevant for most people.

- **Studded shoes**: good for ice in the winter. Unfortunately they are not so good on slushy snow, and very uncomfortable on asphalt, so there needs to be quite a lot of ice before I consider wearing them. Budget tip: you can also buy spikes separately and screw into an old pair of shoes.



Examples: daily trainer, racing shoes, trail shoes.

Some people (running shops) also believe that some people have feet and/or running technique that means that they need extra support and stability elements in their shoes. The science doesn’t really support this, as the rate of injury doesn’t seem to be affected at all by the use of specific stability shoes. My feeling is that the most extreme stability shoes are on their way out, and that most of the previous users are going for “stable neutral” shoes these days. Of course some shoes are more unstable than others, so if you find a shoe that is problematic for you then you should avoid it.

Some other words you can encounter:

- “Stack” and “drop” - stack or sole thickness is how thick the shoe is, how far above the ground it will get you. For most shoes the heel is thicker than the forefoot, and the difference between these points is called drop. So if a shoe is 30 mm in the heel and 24 in the front, it will have a 6 mm drop. Barefoot shoes and more “natural” shoes have a low or non-existent drop.

- “Illegal shoes” - for races there are a lot of rules regarding shoes, and one of the rules is that road racing shoes can’t have a stack over 40 mm. Some modern shoes do, and thus they are not allowed for elite competition. As an amateur, no one will inspect your shoes or disqualify you, so it’s merely a moral and theoretical issue.

- “Rocker” is how the shoe is curved underneath. A shoe with a strong rocker can feel fast and “roll forward”, whereas a flatter shoe feels more “natural” to run in. There are lots of different geometries where the rocker begins and how pronounced they are these days.

- “Shoe rotation” - to have and use several pairs of shoes. Usually you tell yourself it is necessary because you have different shoes for different things, such as a thinner shoe for everyday, a faster shoe for intervals, a thicker shoe for long runs and so on. Having more than one pair is not necessary, but a bit of variation is good for the body.

- “EVA”, “TPU”, “PEBA” - these are different plastic foam materials used in the midsole (soft bit) of the shoe. EVA is a robust old school foam, and PEBA is a much lighter and bouncier foam used originally in racing shoes. There are new acronyms all the time for those who care.

How long do shoes last? I recommend only using your running shoes for running, and tracking the usage of your shoes (for instance in Garmin or Strava) so you can see how many kilometers they’ve done. The shoe brands usually recommend retiring shoes after 600-800 km but they also have incentives to sell you more shoes. In practice most shoes can last over 1000 km. I have a couple of pairs approaching or exceeding 1500 km that I still use, and some racing shoes with over 700 km that still feel good. Racing shoes lose some of their bounce after a while, but if you replace them you can still use the old pair for faster training.

My personal criteria for running shoes:

- I want the big toe to be straight and I don’t want the other toes squished together too much. This is an important thing for me, both for foot comfort and also because a bending the big toe in makes the foot a bit less stable and loads the ankle in a bad way. I don’t have particularly wide feet but I’m used to walking in barefoot shoes, and some models are just too tapered for me. If you are extra sensitive there are brand like Altra and Topo that have roomy “anatomic” toeboxes as their thing.

- I want the shoe to feel light and natural to run in. For my everyday runs I don’t want a big blocky shoe that has too many opinions on how I should run or a shoe that is too stiff. A bit of bounce is also nice. For racing shoes you have to accept that they are less natural, but there are fast shoes that aren’t too extreme as well.

- I don’t want a stiff heel counter, the bit that holds the heel at the back, because that causes my heel and achilles tendon to hurt.

Electronics

It is convenient to use a GPS watch to log how far and fast you have been running, your heart rate and so on. The most expensive models have a lot of features, but I don’t believe you need any of that and that you should stick to the simplest one that does everything you actually need. I prefer the running specific ones with physical buttons, and otherwise as simple and lightweight as possible.

In addition you can also have separate sensors such as heart rate straps, or foot pods that increase the accuracy when running on a treadmill, but you can buy those later if you need them. I wouldn't worry too much about the looks and smartwatch features of the watch either if you don't plan on using it as a regular watch, it's fine to just use it for running and then take it off.

You can also use your phone or nothing at all. When I started running I didn't use any kind of GPS, then I started using my phone and then I bought a second hand GPS watch. There are still elite runners out there training without any type of GPS.

Other types of gear

Put an elastic band around your keys to keep them silent.

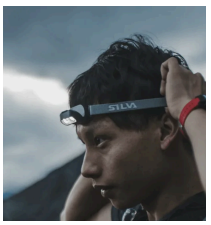
Caps, sweatbands, sunglasses etc can be nice if you want.

To avoid chafing you can apply fatty skin lotion, vaseline, shea butter or other lubricants to sensitive areas between the legs, under your arms and between your toes. I also like wearing toe socks during long runs for that reason.

Hydration vests, backpacks and similar with soft flasks or bladders can be good if you run far or in remote places and want to bring your own water and gear. There are also backpacks designed specifically for holding laptops and clothes for running to work.

For runs where you don't need as much gear, you can use a waist belt or bag. You can fit keys, phones, gels in them depending on your needs. It doesn't have to be a fancy model, a cheap "travel wallet" thing can also work.





For dark places it's convenient to wear a headtorch. They exist in many different price ranges and power outputs.

When running in the mountains and on challenging trails you can also bring poles (for the uphills), emergency blankets, first aid kits and similar.

How to run

You've put on your shoes and you're heading out running. How do you do it? How far and fast should you run?

If you have never run before

Wear whatever clothes and shoes you think are best, and pick a direction. Start jogging and try finding a tempo that feels relaxed and sustainable. Run for a bit, and if it's too hard then you can walk for a bit. When you've been going for five or ten minutes, consider turning around and heading back home. It's better to be careful and do too little than to overdo it. Ideally you feel good afterwards and want to do it again, rather than forcing yourself through misery that puts you off.

If you want a more detailed plan you can try looking up a "couch to 5k" plan. They usually start with walking mixed with running, and gradually build up towards running continuously.

Route and terrain

In the past you just ran what felt reasonable, and then you maybe looked at a map and decided roughly how far you think it was. If you were very serious you also wrote all of this down in a notebook. You can still do it this way if you want, but the technology has evolved.

These days there are many tools for planning routes, measuring distance and so on, but the main principles are the same. You still have to go out into the real world, and you want to avoid places where there are lots of obstacles and traffic lights. Flat roads are faster than hills, and it's fun to explore new areas and get to know your surroundings.

This might not be applicable to you depending on where you live, but at least in Sweden there are plenty of forests and paths to explore, either with a map (such as Naturpasset) or just by feeling.

If you have the possibility it's also fun to take a bus or train somewhere and run back as an adventure. You can stop for lunch or coffee on the way and just enjoy a nice day out.

Treadmills

Where I live the roads become very hostile to running fast for a large part of the year, and then it can be convenient to run on a treadmill inside. I think it's worth pointing out that treadmill running isn't exactly comparable to running outsite, both because the situation is a bit different and because the calibration of the speed can be a bit off. But sometimes it's the best option anyway. Just treat it as its own thing and don't worry too much if the speed is faster or slower if the feeling is right.

Pace

The most common issue for beginners is that they start off way too fast and get tired very quickly. The key to running a long distance is to take it easy and find a sustainable pace. When you get more experienced you will find it easier to judge the nuances of how hard you are going and for how long you can sustain different levels of effort, but for a beginner it's more important to just try to keep it relaxed. If you can't run continuously at all you just have to do your best and take breaks.

I don’t want beginners to worry too much about their pace, but it’s worth mentioning that runners like to talk about speed in terms of minutes per kilometer (or per mile if you’re so inclined) rather than kilometers per hour. For example 10 km/h is the same as 6 min/km, and you can easily calculate that 3 km would take 18 minutes and 5 km would take half an hour. Similarly 5 min/km means 10 km in 50 minutes, 4 min/km means 40 minutes and so on.

Running technique

Running technique is a complicated subject with lots of conflicting opinions online. Running fast in a sprint is a different thing, but when you want to run far it has to be relaxed. Efficient running technique is like a dance where you bounce forward using the capabilities of tendons and muscles to store and release elastic energy.

When the best runners run it looks very easy and bouncy. They rotate their hips every step so it’s higher and forward for the front leg, and vice versa for the rear leg. The arms usually move close to the body and the posture is tall but relaxed (see the video Unlock your hip).



Eliud Kipchoge, previous world record holder and 2x olympic champion in the marathon

Often it can look different in real life compared to how it feels, so it can be interesting to see a video recording of yourself running or looking at a mirror in a gym to get a more real impression of how you run. Avoid doing drastic changes to your technique, but find small changes that make it feel better over time.

Water, energy och salt

When running for an hour or longer it is reasonable to start thinking about consuming water and energy during the run. Water can be brough along in a bottle or found in a tap along the way. Energy usually means sugar, and comes in many forms. If you’re out for an easy run you can probably eat bread, candy or whatever, but if you are going fast the risk of stomach issues increase when you try to eat things that are too complicated for the stomach to process. In that situation something very simple (like sports drink or a gel) is preferable. Sports drink is glorified sugar water, and a gel is a very thick concentrated sports drink, packaged in a convenient little portion packet.

If it’s warm or you’re sweating a lot it’s also worth considering consuming extra salt and “electrolytes”. Ordinary salt goes a long way, but theoretically you can also benefit from potassium, calcium and magnesium. Most sport drinks and gels contain salt, but if you need more you can buy special salt tablets or bring little sachets from a fast food restaurant.

See also Energy during running - how much per hour?

Running as a form of exercise

Motivation and goals

It's often fun or motivating to have goals or comparisons to see your own development, and in running a lot of people sign up for races. A race can be a challenge to reach a new distance (e.g. 5 km or a marathon) or to hit a certain time (e.g. 10 km in 60 minutes). Races are also nature experiences, festivals and social events.

Apart from races, there are of course plenty of other more fundamental reasons to run such as having fun, seeing new places, and staying healthy. When I started running I found it motivating to hit 100 km in a month, and trying to do it several times in a row. At a later point I started a "run streak", meaning to run every day, and that's been really good for me, because you stop worrying about "if" you want to run and just have to fit in "when" you can do it in the day. Often when the weather is bad or when you feel a bit tired, going for a run is actually the best thing you can do to feel better, even if it feels unappealing before you go.

One type of motivation I want you to be cautious about is running to lose weight. I don't think worrying about weight is good for you, physically or mentally. Of course some people lose weight from running, but running a lot requires you to eat a lot to not get injured. I think it's better to just focus on running.

How much should you run?

Swedish ultra runner Rune Larsson says in his book that you should only run so much that you still feel like doing it again tomorrow. Everyone has different levels of ambition and different amounts of free time, and there's no right or wrong. Putting high standards and making it difficult for oneself to go out running is a good way to never really get going. It's better to find a level where you find it fun and want to continue.

The body adapts to load, so by running more you naturally get better at running, which makes it more fun. But if you start from scratch the development of muscles and fitness goes a lot faster than tendons and bones, so it's important to increase gradually to not overdo it.

When you start running it's easy to run too fast and too far, and to keep yourself healthy it's wise to stick to some rules of thumbs such as not increasing weekly mileage by more than 10% week to week. In studies, one of the biggest risk factors for injuries is to increase the length of the longest runs (by a similar percentage) compared to the last couple of months. Of course these rules don't always make sense. If you never run you have to start somewhere, and if you run a lot and take a week off due to illness, you don't have to start over from zero. And if you want to run a really long race you often just have to take a chance

and see if it works rather than trying to do absurdly long training runs. With these rules in mind, you can judge and be aware that you are taking a risk when you are breaking them

To fit running into your everyday life

I often speak to people who say they want to run but don't have the time. My perspective is that I run at least 2 km every day and that people have more time than they think. Of course it depends on your job and life situation, but to get changed, run a bit and shower afterwards doesn't have to take more than half an hour, and most people have quite a few half hours to spare in a week. I usually run either before work, as a commute to work, on my lunch break, in the space between long meetings, with my son in the buggy and so on. Usually there is some way to get it to work. Some concrete advice:

- If you can, consider running to and/or from work
- If you have kids, consider getting a running buggy (stroller). Of course you can run with a normal buggy as well, but one built for running is more stable when turning and has good features such as a hand brake and large wheels
- If you can, get up early and run while other people sleep
- If you live with someone, speak to them about running and when it would makes sens for you to run. It's important to have them on your side and not make them feel like you are escaping household tasks and being selfish.
- Bonus advice: get them to start running (or some other type of training) themselves, so they start sharing your perspective. You can also go running together.

Continuity and development

Sometimes you feel like your training isn't going anywhere, and that doesn't mean you are doing something wrong. Long term development doesn't come from individual runs, but from staying at it and trusting the process. See also Att planera och strukturera sin träning

Topics worth considering

Warmups

Just going for an easy run usually doesn't require any warmup, but for faster sessions it's good. My suggestion for a basic warmup is to run slowly for 5-10 minutes, then do some mobility exercise and dynamic stretching depending on how the body feels. You want your blood flowing and your body ready for the full range of motion required for running properly before you start the fast running.

Recovery

It's not training that makes you better, but the body building itself up afterwards. Exercise is a stress on the body, and if your life is full of other types of stress you won't recover as well, and then the risk of injury goes up. You can't adapt your recovery to your training, you must adapt your training to the recovery.

Sleep

Sleep deserves its own section because it is completely free and the most important part of recovery. Even if it's interesting to see your resting heart rate and HRV vary with your training load, I would caution against going too deep into tracking your sleep. The sensors and algorithms are not very accurate and worrying about it just creates more stress.

Stuff influencers are trying to sell you

Expensive massage guns, compression socks, ice baths, electrolyte drinks… Lots of money but little to no effect.

Injuries

Acute injuries (rolling your ankle or breaking a bone) are hard to prevent, but overuse injuries (inflamed tendons, stress fracture) are common among people who train a little bit too hard without listening to the body. It is much better to cut a run short than to push through and be out of action for three weeks. A contributing factor is not consuming enough carbohydrates: new research shows clear links between energy availability and injury risk.

Strength training

It's beneficial for your running performance and to avoid injuries to do strength training such as lifting heavy weights. I don't do any of that myself so it would feel wrong to say that you have to do it, but it's been shown to be beneficial. Nothing too complicated: basic strength exercises such as deadlifts, lunges and so on are enough, preferably with relatively heavy weights and few reps.

Plyometrics

Another beneficial type of training is plyometric training (jumping and bouncing). It doesn't have to be complicated either, skipping a rope can be enough, even without the actual rope.

Heat and altitude

Running in warm weather is an extra load on the body since it also needs to cool down. Studies on population level show that temperatures between 10 and 15 degrees is when marathon races have the fastest average finishing times. There are empirically derived formulas for converting running in different temperatures - for instance 6:00 min/km at 25 degrees is about the same effort as 5:52 in optimal conditions, which is almost 3% slower.

Running at a high altitude where the air is thinner is also hard for the body. Some people go on altitude camps or do heat training (in a hot room or lots of extra clothes) to get more out of their training but that's quite extreme for a regular person.

Eating and drinking as a runner

Food and nutrition

I have no medical eductaion, but I notice that when I run a lot I feel a lot better eating a lot of carbohydrates. Of course you also need fat, protein, iron (runners tend to need more iron) and so on, but carbohydrates are very important for endurance training. As I mentioned in the injury section, eating too little carbs is a big risk factor for injuries.

Energy during running - how much per hour?

When running for longer than an hour, the body starts to run out of the energy stored as glycogen and then it's good to add extra energy. Ideally you want to start already at the beginning of the run. For shorter runs it's not as important, but it can still be beneficial.

Usual advice is for people to aim for around 60-90 grams of carbohydrates per hour, which is around 2-3 ordinary gels. Reaching these levels usually requires a bit of practice (doing it in training) but the gut is very trainable. It is possible to tolerate even higher levels. Elite athletes often claim to be using 120 grams per hour or more.

Regarding the carbs: normal sugar is broken down into fructose and glucose in the body, and these are consumed through different mechanisms. If you only consume one of the two, you are using less of the bandwidth. Most sports drinks and gels use maltodextrin (a chain of glucose molecules that takes a little bit longer to break down and isn't as sweet) and fructose together to target these two pathways.

I use gels in races because they are convenient and easy to count, but in training they can get quite expensive. Some ways to save money:

- Buy a big bag of sports drink mix. Mix into a small bottle or soft flask. I usually mix 90 grams into a 150 ml bottle, which is like 3 gels but at a fraction of the price.
- Even cheaper: buy maltodextrin and fructose separately and mix your own sports drink with a bit of salt. Tip: maltodextrin is easier to dissolve in hot water.
- Cheapest: Use normal sugar and a pinch of salt. Works if you can tolerate the flavour. Add some flavours if you want, for instance some lemon juice. You can also mix in honey, sirup and other sources of sugar.

One advantage of having gels/strong sports drink and water separate is that you can adjust them independently of each other. Practically, I usually bring several small bottles of sports drink and drink water based on thirst.

Performance-enhancing supplements (caffeine, bicarbonate)

There are several (legal) things you can use to enhance your performance. One of the strongest and cheapest ones is caffeine, which reduces tiredness and perceived effort. Other ones are bicarbonate soda (which affects the ph and helps when the body produces lactate), nitrate (found in beetroot juice) and beta-alanine. Creatine (used by the muscles in explosive

movements and is common for people who do strength training) can have some benefits for runners as well.

It can be hard to judge what actually works an what is only marketing. A couple of years ago, all the Tour de France riders were seen drinking small shots of ketones which was said to improve recovery, but people don't believe in that anymore. One more recent development (and a bit more promising) is the use of isothiocyanates (ITC) that triggers some kind of reaction in the body that promotes recovery and improves handling of lactate. A swedish company (that sponsors Andreas Almgren) discovered this and started selling tiny and very expensive bottles with this substance. Critics are saying there's not enough independent science backing it up, but other companies are developing their own versions and hopefully there will be more research eventually.

I don't use any of this except caffeine, which exists naturally in coffee, but also as an additive in some gels I use. I have also used creatine. Once I got a free sample of ITC bottles from a race, and I tried them, but I can't tell if it did anything. If you are not sponsored, rich or very ambitious I think it's hard to motivate the cost.

Performance-decreasing supplements (alcohol)

Alcohol and other drugs have a negative effect on your training and recovery, but you are free to do what feels best for you and live a little. To drink a few drinks now and again will not be a disaster, but if you can avoid drinking the day before an important session or race you will definitely be better off.

Social aspects of running

Impostor syndrome and elitism

If you ever thought that you're "not a real runner" or have been hesitant to run with people because you are too slow, you are not alone. It can feel as if people are staring at you when you are out running, but it's often just a feeling. In general people don't really care or notice. People who do run a lot all know that the pace you don't run as hard as you can in training, that you can have a bad day, maybe getting back from illness and so on. A normal person who has finished school won't ever be dismissive about your pace. My impression is that the faster people get, the more humble they get because they know that everyone starts somewhere and that they themselves are so far off compared to the very best in the world. In the end everyone runs purely for themselves, and unless you are trying to become an elite runner comparing yourself to others is meaningless.

Running with others

It's fun to run together, and for it to work out when people are at different levels you need to talk about it and adapt it to the slower person. A faster person can usually run slower for an easy run without it being an issue and would often prefer to do it to get some company, whereas the slower person will destroy themselves if they try to go too fast. The faster person can also do an extra bit at the end if they want, there are plenty of possibilities to get

it to work. If you run intervals in a small space such as a running track, you can run based on time, or adapt your sessions so they are different but have breaks at the same time so you can speak to each other if you want.

Clubs and running groups

There are plenty of running and athletics clubs that also have training groups for adults who aren't elite runners. Usually there's some kind of weekly session that you can attend to train with your teammates with a coach that makes sure it works for everyone.

There are also plenty of less formal and completely informal groups you can run with, for instance organisations that go to different places each week and run together, or just a group chat of friends who meet up. My wife for instance runs every week with a group that runs in the forest with someone showing the way, which is completely for free.

The instagram version of a running group is called a "run club", and means that people meet up at a café, get a free smoothie, and then run a bit together whilst taking lots of selfies. There are plenty of these groups around, for instance "slowrunning" groups that target people who self-identify as running very slowly.

Running on a track

In Stockholm all running tracks (including the olympic stadium) are open and free for everyone to use. Where you live it might be different. That means that everyone, even slow people, can go there and train. Sometimes it's booked for an event or football practice, but often if you ask nicely you can run anyway.

When running on a track it's good to consider etiquette: run the right way round (counter-clockwise), stay out of the way when not running. If you are running intervals you can do it in lane 1 (the innermost lane) regardless of how fast you are, the faster people will overtake you on the outside. If it's very crowded, if you're warming up or doing time-based intervals, you can also run in another lane.

Strava and instagram

The most popular platform for sharing training is Strava, and is part digital training log and part social media. The app also functions as a GPS tracker, and they have premium functions such as route planning that you have to pay for. I use Strava to share my runs (automatically from my GPS) and I think it's fun to see what my friends are up to with their training. It's not mandatory to use Strava and I recommend not taking it too seriously. If you want to use it but feel worried about privacy you can consider using a false name or limiting your profile visibility so only your friends see your activities.

Instagram and other platforms can be a bit strange when it comes to running content. A lot of people seem to have weird motivations for what they are doing and they promote idiotic workouts, bad technique advice and generally just brag about being very fast. A lot of people are nice though, so follow them instead.

Races

Most people who run races are not there to win, but for a fun experience, meeting friends and testing their own limits. But how does it work in practice and what should you think about when you are going to run a race? That's what this section is about.

Different kinds of races

There are many kinds of races to choose from, each with its own charms, and what interests you is of course personal preference. I want to stress that longer is not automatically cooler or better. Getting through a short race might be easier, but running it fast is very hard. Shorter races mean higher paces, which brings another type of challenge. Race distances like 5 and 10 km are fun because most people can get through them, you get to run quite fast, and when you are done you recover from it faster than from a marathon. I also recommend running races in the forest because it is a fun challenge and brings nice nature experiences. Se also Training for different distances

Road races

The most common type of race is a road race, meaning that you run it on a road. They exist both in standard distances such as 5 km, 10 km, half marathon (21.1 km) and marathon (42.2 km) but also odd distances that are specific to the race itself. For instance the big race Lidingöloppet is a hilly road race that measures 30.3 km. Road races exist on a spectrum between very big commercial races with lots of participants (such as a big city marathon) or a tiny local race where it's a lot more friendly and personal.

Different races have different conditions. Some are several laps on a shorter course and some have start and finish in different cities. People who are looking to run fast seek flat courses, and people who want a festival seek a fun course with stuff like DJs and things that happen around it. Often the really fast races are also smaller event that are also cheaper to enter, while the ones with DJs are usually a bit more expensive.

It can be fun and cool to run a big race, but small and medium size races are my favourite. If you are not amongst the very fastest, going to Berlin or London marathon just means that you are in a huge pack of people at all points during the race. If you compare that to say Malmö marathon with only a couple thousand participants, you can actually run your own pace there. I also want to mention Parkrun, a recurring and free 5k event that is organised in a lot of places.

Track races

In athletics it's common to run races on a running track. A normal track is 400 metres and then you run for instance 800 metres (2 laps) or 5000 m (12.5 laps). Some of the most famous track races are only for elite athletes, but there are plenty of races open to amateurs as well, mainly during the summer. Some of them require membership in an athletics club

but others allow anyone to enter. I've done a couple of 5000 m races and it's very fun. In case you're wondering "5 km" means road race and "5000 m" means track race.

Trail, mountain and mixed terrain races

Running on trails and paths is fun and more popular than ever. Given that the course is unique and the weather affects the surface a lot, times are not comparable between races or even with the same race in another year. This can feel liberating if you are coming from chasing times. Trail races are often in remote places and often have a list of mandatory gear that they require you to bring. There are also trail races in cities, and then they might contain a mix of sections of asphalt and trails.

Timed races and other types of races

In ultra running it's fairly common to have a set course and a set time limit and then run as many laps as possible. Common formats include 6 hours, 12 hours, 24 hours, 48 hours, 6 days and so on. You are allowed to stop for food or sleep as often as you want. The alert reader will understand that you need to reach a marathon distance before it turns into ultra, but of course everyone doesn't do that. It's common to get official splits for distances along the way, so you can use a timed race to get a time for distances like a half marathon, 50 km or 100 km.
A related format called backyard or "last man standing" has become quite big in the last decade, and in this format everyone starts a roughly 6.7 km lap every hour, and if you make it through you get to start the next lap until only one person remains. There are other variants on the same theme as well but I'm not going to expand on that here.

And then there's orienteering, swimrun, triathlon, duathlon and other sports where running is a major part of the competition.

Masters championships

I want to mention that if you are over 35 years old, you are considered a "masters athlete" and you can compete in special competitions and championships agains people in the same age category. The age categories are in groups of five years, for instance M35 (men 35+), W40 (women 40+) and so on. In Sweden we have yearly championships where anyone can turn up and compete. Internationally, there are running athletes all the way into the M100/W100 categories.

Participating in a race

Here I want to go through some practical aspects for those who have never entered a race before, and some tips for how to have a good time and set a good time in it.

Sign-ups and lotteries

Most races you can just sign up online, often all the way until the day of the race. However, many big races have become too popular for their own best, and sell out within minutes as if they were a rock concert, and some have started having lotteries and qualification systems. An extreme example of this is the mountain race UTMB in Chamonix, where you need to

participate in several of their other races to even get a spot in the lottery. In Sweden at least, your employer might support you financially when entering a race through your welfare benefits, so if you have some money left at the end of the year you can sign up for a race.

Eating before the race

It's good to be a bit careful with what you eat before a race. A big meal of fat, fibre and protein the night before might make you a bit nauseous during the race which doesn't lend itself to a great experience. It's better to go for easy-to-digest foods with lots of carbohydrates that you know you can tolerate, such as rice with a basic sauce or a simple pasta dish. You should aim to eat as many calories as you normally do, but try to get a larger part of them through carbohydrates. The hours before the race you can also try getting down some extra sugar and extra caffeine, but be careful and leave some margin with the timing so your stomach doesn't go crazy just in time for the race start.

Number bib, warm up, starting pen

You can often pick your bib up ahead of the race or on the day of the race. You pin it to your top with safety pins or similar. Then you can usually hand in a bag with warm clothes that you can fetch after the race.

When you are changed and sorted you ought to do some warmup. I would recommend at least jogging a bit (like a kilometre) and then doing some short accelerations before going to the start line. You want the body to be active and ready to run fast. In the big races it can very crowded and then it is a challenge to keep warm (or in summer, cool) while waiting for the start. Maybe you can wear a jacket to the start and then give it to someone you know outside the fence, or wear arm sleeves that you take off before the race. I've also seen people wearing big bin bags as a temporary jacket, but I haven't tried that myself.

Pacing, pacers

One of the biggest traps when running a race is to go too fast in the beginning. The best strategy is to take it easy in the beginning and find a sustainable pace, and go faster in the second half if you have capacity for that. If you go out too fast and get tired, the rest of the race is painful, but if you run too fast in the end, well, then you can rest. Doing the first half of a race faster is called a "positive split" and going faster in the second half is a "negative split". Trying to have an even or negative split is usually the fastest and most pleasant way to run.

There are often pace keepers for the big round time goals (60 min, 50 min, 40 min..) and they wear flags, signs or balloons to make sure you see them. It can be a good idea to check in advance if there is a pacer for your goal time as it can affect how you want to run your race and which start group you want to be in. If your goal is in between the available pacers, you can go with the slower one for a bit and then accelerate, or just do your own race entirely. The pacers are ordinary humans and sometimes they run a bit too fast or too slow which can be annoying, but it can also be deliberate. For instance in Uppsala marathon, the last 2 km are up a big hill, and the pacers I spoke to had a deliberate and smart plan to run ahead of pace to have a few minutes of margin for the hill in the end. This was to keep the effort even, rather than the pace.

Energy and water in a race

In most races there are water stations where you can get water or sports drink. In longer races you can usually also get buns, candy, bananas and other edible items. If you don't want to depend on these stations you can bring your own water bottles and energy, for instance in a hydration vest or a waist bag.

To get enough energy in during the race (if it's a long race) I advise making an plan in advance and bringing the energy yourself (see Energy during running - how much per hour?). If for instance you are using gels with 30 grams each, and want to have 90 grams per hour and plan on running for 3 hours you need to bring 9 gels, and you don't have to guess how much sugar was in the cups at the support station or risk eating something you've never tried before.

I like having energy and water separate, meaning consuming gels or strong sports drink and then pure water when thirsty. I try to avoid bringing my own water because it's heavy and uncomfortable, and in a normal city race the water stations are usually enough. It's good to have a look at the official information and plan accordingly. In longer races in remote places it can be quite far between the stations, and then you need to bring your own water. For trail races it's often even mandatory to do so.

Music in races

Even if you like running with music I would recommend thinking a bit before doing it in a race. In a shorter race with lots of spectators you miss a lot of the atmosphere and the experience if you go into your own bubble, and it's also easy to be in the way for other runners and get into accidents. For instance in a race here in Stockholm on a two lap course, the leader was lapping a group of people when one guy with big headphones just randomly went off to the side, causing a collision with people falling over.

In really long races I often bring headphones, but save them for the last bit of the race when I need a distraction and a mental boost the most.

Gross time, net time, GPS time

Gross time (gun time) is the time from the start of the race until you reach the finish. This is what counts for the elite field. When there are many participants it can take a while for everyone to get going, and then there's also a net time (chip time) which is the time from when you passed the start line until you reached the finish.

Your GPS will probably disagree with you and measure 9.7 or 10.3 instead of 10.0 km, and then Strava and other services will display a different time than the official result. Net time is what really counts because your job is to finish the race, not to get 10.0 on your watch. Most serious races have certified measurements taken along the shortest path on the course, and the measuring wheel they use is a lot more exact than your GPS. So if you want to brag about your race online, remember to use the official time instead of what Strava says.

Planning training with structure

This is a deeper dive into some topics related to training. If you are a beginner or just not very interested, it's probably not for you, but if you want to know how you can train to get faster, this will be a good overview.

Different types of runs

You can get far by just running reasonable amounts at a reasonable speed, but if you want variation or want to improve a lot, it's good to mix up your training. Here are some different types of workouts that runners do:

- **Easy runs**: ordinary runs where the goal is just to collect some mileage. Not too fast, not too far. Easy runs are the most common type of runs and are the foundation for every serious runner.

- **Interval sessions**: when you run short periods, broken up by rest. For instance distance based intervals: 5 x 1 km, 10 x 400 m, or time based intervals such as 5 x 5 minutes. The rest can be standing, jogging, walking or something else. How hard and what effect the session gives depends on the speed, the number of reps and the rest. Shorter rest means less time to recover, which means you can't run as fast. That makes it more aerobic. Longer rest means you can recover more and run the reps faster. Consider for instance 10 x 400 with 3 minutes rest, or 10 x 400 with 30 seconds rest. In the first one you can train running fast, the second one will be more for your endurance.

- **Progressive runs**: when you increase the speed during the run. For instance 9 km total where every 3 km section gets faster, or running slowly one way and running back faster. Progressive runs are a good way to train running fast when you are tired, without making the session too hard.

- **Long runs**: when you run far, which of course is relative. Depending on who you are and what you are training for, a long run can be 15 km or 35 km or sometimes even longer. The benefits of a long run includes training the body to run when tired and practicing fuelling. Long runs can be slow, fast, progressive, have a fast finish, or have built in interval sessions.

- **Treadmill runs**: these are often interval sessions, and often during the winter. A good and common treadmill session which is hard to do without a treadmill is 45/15, where you run 45 seconds, jump off and rest for 15 while increasing the speed one step before continuing with the next 45 seconds and repeating until you feel done.

- **Sprints and strides**: these are not sessions on their own, but things you can do in another run. For instance running 5 x 20 seconds fast at the end of an easy run is a good way to add some speed without having a whole interval session. It's also common to do hill sprints, which are sprints up a hill.

Planning a week and a longer period

Even the very runners who do nothing but run and rest avoid training hard more than a few days per week. As a recreational runner with other things to do, you shouldn't think that you have to run fast all the time because that doesn't work. For example, if you run 3 times a week, you can aim for something like this: 1 short, easy session, 1 slightly faster session, 1 slightly longer, easy session. If you run more times a week than that you should avoid having two hard days in a row. I give some concrete examples below.

The best runners and coaches use lots of periodisation, which means training differently during different parts of the year. The most classic system starts with base training, where you focus on running a lot and getting as fit as possible. Then you gradually transition into more speed and specific sessions that are relevant for the races you are targeting, and then in the last couple of days before the race you take it very easy so that your body is as fresh as possible for the competition. This last step is called tapering. Although it's tempting to test your form with hard workouts before a race, the smarter thing is to not do that. Your fitness is like a growing vegetable that you'd rather leave in the ground until it's time to harvest it.

Training week examples

To make it a bit more concrete I want to add some examples of how one can train with a bit of structure. For instance if you want to run three times a week with some variation, you can do something like this:

- Short easy run (30-40 minutes)
- Faster session (e.g. warmup + 3 x 5 minutes intervals)
- Longer easy run (60-80 minutes)

If you want more running than that, you can make the runs longer, or add another day of easy running. A more substantial plan for running six days a week could look like this:

- One interval sessions with shorter, faster intervals (e.g. 15 x 400)
- A progressive run (e.g. 9 km going faster every 3 km) or an interval session with longer, slower intervals (e.g. 5 x 5 minutes)
- One long run (90 min)
- Easy runs on the days between the other sessions (30-50 min)
- One day completely off from running

If you want to train for a race, you gradually modify the workouts to be more relevant for the distance you are training for (see Training for different distances). For example:

- Marathon: gradually lengthen the long runs up to around 2-3 hours, sometimes with a fast finish. When the race is approaching, skip the fastest intervals and do more sessions at appropriate marathon efforts. The long runs are the most important ones, so adapt everything else around them.
- 5k: add some faster, shorter sessions with speeds that approach the speed you want to do in the race. For instance 6 x 800 or 5 x 1 km. The long runs don't have to be very long here.

- 10k: stuff like 8 x 1 km, 3 x 2 km with speeds a bit slower than your race pace, gruadually increasing the pace when the race is approaching.

There are infinite possibilities to optimise and complicate your training plan, but just sticking to a basic setup that you can modify a bit depending on your needs will get you a long way. If you are interested in more detailed knowledge i recommend the sections Books and podcasts as well as References for further information about training. You can also ask me, or find a professional coach.

Training and physiology

This section is about the body and how it works in relation to running. I am not an expert and I won't pretend to know all the biology. There are better sources to go to if that's what you want.

Feeling, pace, heart rate

When you run a lot you develop a sense of intensity and the different nuances of how hard it can feel. Often when I'm out running I know roughly how fast I'm going without looking at the GPS, and when I'm going for an easy run I usually don't look at it at all. Races are a bit trickier since you are trying to find the limit of what you can sustain, but with practice you get better at knowing what that limit feels like.

Heartrate, pace and speed usually correspond quite well to each other, but depending on your shape and how fresh you are, one or two of them can be a bit off from what you expect. If your muscles are sore it can feel like hard work despite the pace and heartrate being low, and if you've gone through a big stressful event (such as a marathon) your heart rate can be high despite the effort feeling very easy. In those situations I think it's good to look at the overall picture and let the feeling decide rather than sticking firmly to HR or pace.

Pace in relation to race pace

A common way to talk about pace (mainly for interval sessions) is to relate them to how fast you want to run in a race. People talk about 10k pace or marathon pace, and also say stuff like "between 5k and 10k pace" or "85% of marathon pace". All of this is of course hard or impossible to know exactly if you haven't done an all out race recently, so a lot of it is qualified guessing, and for a beginner runner it's not very helpful to think in those terms. It's better to train according to your feeling and current fitness and see where it gets you than to decide that some arbitrary pace is going to be your race pace.

Heart rate and heart rate zones

Another common way to talk about intensity is through heartrate and heart rate zones. Everyone has an individual resting heart rate and a theoretical maximum heart rate that they reach when exercising very intensely. Based on this you can make a zone division roughly like this:

- Low intensity: from resting heart rate, up to easy effort
- Moderate intensity: from easy effort up to "threshold effort"

- High intensity: from “threshold effort” all the way to max HR

On the internet and in your GPS watch it’s common to use a 5 zone model, where 1 is the easiest and 5 is the hardest. Zone 1 is usually very easy, and “easy running” happens mostly in zone 2. In the middle of zone 4 is usually where “threshold” (see below) is, and zone 5 is very hard work that isn’t sustainable. I usually don’t think too much about zones, but that’s the rough idea anyway. There are many other systems with different numbers of zones.

Examples of my own heart rate, just to give you an idea: My resting heart rate at night is around 38-40, and I think max is around 187. My easy runs are around 120-135, marathon race effort around 160, 10k race effort 171, 5k race effort even higher, maybe 175. I do most of my “quite hard” workouts at around 155-165 bpm. So for me, low intensity is roughly up to around 135, moderate intensity around 135-165, and high intensity is 165+. That’s not based on any testing or science, just feeling. If I ever do a lab test to find max and threshold HR I can update this section with more specific numbers.

Why are people talking about zone 2 training?

One good reason to train in the low-medium intensity range is because it gives you adaptions to improve your heart, lungs, blood vessels etc without being too hard on the muscles and joints, meaning that you can accumulate more training without being completely destroyed afterwards.

According to some estimates, elite runners do around 80% of their running at easy paces and that is probably true for a lot of them. A lot of elite runners run twice a day and have a truly absurd and brutal weekly mileage, so the remaining 20% is also a lot of harder training. All the easy running is done to get as much running done as possible while staying as fresh as possible for the faster stuff. If you run three times a week you get a lot more recovery between your sessions, so you can probably have a higher percentage of hard training compared to an elite runner.

Some beginners find it hard to keep the heart rate down, and get worried because they’ve read that you must run very easy all the time. But if you are not used to running or if you’re having a bad day, your HR can go directly from resting to very high in a way that makes a zone model useless. In that case you just need to stop worrying and try to do what seems reasonable instead of worrying about the exact number.

Systems and measurable quantities

This section is not very applicable in your everyday life, but it’s interesting to know how the body works when creating energy and movement in the muscles. The most relevant aspect for endurance sports is your aerobic fitness (how good you are at using oxygen), but there are also other systems, for instance explosive processes used for short sprints. Anyway, here are three factors that affect your running performance.

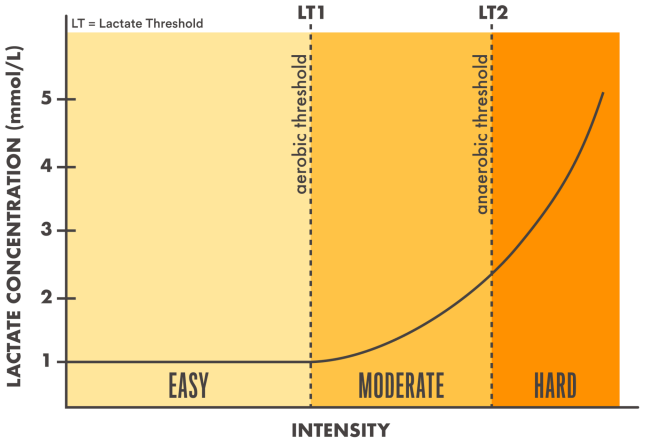
Maximum oxygen consumption (VO2-max)

VO2-max is a measure of how much oxygen your body can use and can be viewed as a measure of your fitness or “aerobic capacity”. A higher value means more oxygen for the

muscles to work with, which is good. You can go to a lab and get a number if you want, but I don't think the numbers are that important. To really increase your VO2-max you can do high intensity training, but remember that all forms of exercise help the body develop a stronger heart, more efficient lungs, more mitochondria etc which contributes to your VO2-max.

Lactate thresholds

Lactate is a substance that is produced in the body, especially during training. At rest, you have a little bit of lactate, and when you exercise hard enough (above the "lower threshold", LT1) the muscles start producing more and more lactate which is used by other muscles as a source of energy. If you increase the intensity even more, you reach a state where more lactate is produced than the body can handle, and this point is called the "upper lactate threshold" or LT2. When someone just says "the lactate threshold" they usually mean the upper one.



You can think of LT1 as the border between low intensity and moderate ("aerobic") intensity, and LT2 as the border between moderate and high (unsustainable) intensity. The term "threshold training" (or "sub-threshold training") is often used to describe training just below LT2, although training close to LT1 has its own benefits.

When the body is trained at handling lactate, the speed at the thresholds increase, meaning that you can run faster for longer. Lactate can be measured with a blood sample, and you can go to a lab to do a test where they give you a graph like the one above telling you what heart rate and pace your individual thresholds correspond to. Some elite runners also have their own lactate meters that they bring along and use in training, but that's quite expensive and involved for us regular people. Your carb consumption and how fresh you are also affects blood lactate levels, so it's a bit more complicated than just measuring a value. See also Steve Magness on youtube

Running economy

Being fit doesn't automatically mean that you will run fast. The actual speed depends on your efficiency in converting energy to speed. This depends on your running technique and how adapted the tissues in the body are. For instance a cyclist or cross country skier can be extremely fit, but have terrible running technique, and then improving the efficiency will be very beneficial. Just as the previous factors, this can be improved by training, with technique

drills, finding a better running form, plyometrics etc. It's hard to measure the economy directly, but you can approximate it from oxygen consumption and pace.

Your personal bottlenecks

Everyone their own individual strengths and weaknesses, both from genetics but also from their training background. Some are fast in a short race but relatively slow in a marathon, while some people run a fast marathon but struggle to go much faster in a shorter race.

Different people will have different gaps between their thresholds LT1 and LT2 and their VO2-max, which means that under some conditions the person with the better theoretical fitness will still lose a race.

Many beginners are faster than their endurance - meaning that they might find the pace for a 4 hour marathon (5:41/km) easy, but struggle to finish the distance. To work on that, they probably need to train a bit more. Another person might run lots of kilometres at a slower pace and find the distance achievable, but find the pace too hard. They instead need to work on their speed and their thresholds.

Training philosophies

Fitness-fatigue and training load

In training science there are many different theoretical models, and one of them is called "the fitness-fatigue model". Conceptually, you expose the body to training "load" which accumulates to a "chronic training load" (or "fitness") but also leads to "fatigue". The fatigue then fades faster than the fitness, so when you are fresh enough you train again and your fitness continues to improve. Ahead of a race you train a bit less, and then fitness goes away even more while fitness remains high. This model is a bit simplified and not exact science, but still useful as a way to think. Versions of this model is implemented in a lot of services, such as Garmin, Strava, Trainingpeaks, Intervals.icu and other places where people plan and monitor their training.

Going for a few really hard sessions

One approach is to do really hard sessions as often as you can, and take it easy in between. A classic setup is a really hard fast interval session each week, together with a "tempo" run (continuous threshold) and a long run. If you can do the hard session without getting injured, this can work really well, but the high intensity is a bit risky for some people. Another example would be marathon runners who prioritise a really hard long run every week and adapt all the other training around how they recover from that.

The Norwegian model - many "hard enough" sessions

Another training philosophy aiming to maximisin "training load" without overdoing any individual session is the "norwegian double threshold" system, popularised by runners such as Jakob Ingebrigtsen and Andras Almgren. The goal is to mainly do "hard enough" sessions that don't destroy you, so you can recover faster and do even more. The "double" part

means doing two threshold sessions in the same day, for instance twice on Tuesday, twice on Thursday and so on, with easy days in between. Some popular sessions in this school of thought are things like 5 x 6 minutes, 3 x 10 minutes, 25 x 40 meters with short rest. Obviously training like this is a full-time job, so it's more of an inspiration than a blueprint for most people.

A version of this which is aimed more at regular people is called "norwegian singles" where single means one session in a day. It's basically half of a double threshold system. Conceptually you decide how many times per week you want to do it, and then you do almost exclusively threshold sessions and easy runs. The fully expanded concept consists of doing one such session (5 x 6 min, 3 x 10 min, 4 x 2 km, 8 x 1 km…) every other day and running very easy on the days in between. The system obviously neglects some higher end speed stuff and has a big built-in margin of error, but the proponents argue that the simplicity and repeatability is a strength and that it's good enough for most people to get meaningful improvements. You can also view it as a good foundation for base training, and then modify it to add race specific stuff when you want to train for a race.

Training for different distances

There's a big difference between running fast for a couple of minutes and running for several hours, so of course the training for different races should be different as well. Better fitness and lactate thresholds are of course beneficial for all distances, but here are some aspects that differ and some things to think about. See also Different kinds of races.

One difference between elite runners and us normal people that I want to point out is that they often run to win, which means they hold back a bit before going for a sprint finish, while average people chasing a personal best benefit from just keeping an even pace throughout. And the fastest people run much faster than me and you, so it doesn't always translate so well even if you adapt the paces. If you run 10k in an hour, maybe it's better to look at what elites do for a half marathon (which takes them an hour) rather than how they train for a 27 minute 10k.

How much do you need to run for a specific distance?

I don't believe there are absolute limite that you have to run a certain volume to be able to finish a race, but you will have a better time if the race distance is not absurdly long in comparison to your training. For example if you want to run a half marathon, maybe you should aim to run at least the same ballpark (20-25 km) in a week at least a few times, and if you want to do a marathon then I would recommend going a bit higher (30-50 km) as well as getting some long runs of at least 25 km in.

With that said, I ran my first marathon on the back of 20-25 km weeks and survived, but my later marathons where I've trained more have felt so much better. For really long races I would recommend trying to do a third or half of the race distance at some point, so if you want to do 92 km in Ultravasan you should be comfortable running 30 km in training and preferably have some marathons or 50 km races under your belt.

Ultra distance (longer than marathon)

In one sense the really long races are easier to train for, since they “only” require a capacity to go on at a low intensity for a long time. The most relevant training is just to run a lot. What makes it complicated is finding comfortable shoes and clothes, and the logistics of energy, water and gear. Before your race you should really study the course to see where the stations are, if there are big hills, what the surface is like and so on.

One aspect of really long races is that the challenge becomes more mental than physical, and this is hard to prepare for. Running a really long long run (over three hours) is not necessarily the best training, but it can be a good confidence boost and a way to test your gear. People who run 100+ km in races rarely run anywhere close to that far in training. Many ultra races are also trail races, which is discussed a bit further below.

Trail and mountain races

Races with uneven terrain and lots of hills require different training than a flat race. Running through stones and roots can be mentally tough when you are tired, especially if you haven’t practiced it before. When the hills get steep enough, the fastest and most efficient way to get up is to walk, so for the long mountain races you need to practice walking (“power hiking”) up the hills. When it’s very long and steep, it can also be beneficial to use poles.

Good sessions: hill training, running in relevant conditions, time-based intervals in the forest

Marathon

As I mentioned before, the challenge for most beginners is to just get through the distance, which is a matter of training more. If you then want to run a faster marathon you also need some speed, and you need to train speeds that are relevant to the race. One interesting way to think about it (that I’ve read in Andreas Almgren’s book and heard from Steve Magness) is to try to work on speed first, and start marathon training when you are in good 10k shape. Then you build endurance with longer long runs with sections of marathon effort built in. [Update: Andreas just won New York marathon, so I guess it works quite well]

Good sessions: long runs, long runs with fast finish, progressive runs, longer intervals (4 x 5 km) at marathon effort

Lidingöloppet

In a Swedish context, Lidingöloppet is a very famous and popular 30 km race known for having a lot of hills. In the grand scheme of things, it’s not a mountain or trail race, but there are many short hills and it’s steep uphill or downhill almost the entire race. The race is run mostly on gravel and asphalt and is famous for being hard to execute perfectly. To train for it you need to train a bit like a marathon, but focus more on hills and rolling terrain.

Half marathon and 10k

The fastest runners run a half marathon in an hour, and a normal person runs a 10k in roughly an hour, so time-wise they are quite similar. A fast amateur will be somewhere in

between, and will probably have a 10k race speed that is quite uncomfortably fast to do in training, while half marathon pace is a bit more doable. Regardless of how fast you are, both half marathon and 10k races require you to train both a bit of speed and a lot of endurance.

If you are doing a threshold focused training program, you will naturally be in quite good shape for the 10k and half marathon without any specific sessions, but if you really want to perform at your best in a 10k you probably need some specific work before the race. Starting with something like 10 x 1 km at 10k speed right away will be very hard, so it's more doable to build up gradually, either with fewer reps or with slower speed. For a half marathon, it's more relevant to add longer and slower intervals, progressive runs and long runs.

Good sessions: 10 x 1 km, 5 x 2 km, 3 x 3 km, 20 x 400 with short rest, progressive runs

5k and 3k

The 5k is probably the worlds most popular distance, since it's achievable for most people, but still very demanding if you want to run fast. The recovery from a 5k race is much faster and shorter than a marathon, so you can run more races which is a lot of fun. The 3 km or 3000 m distance is not as common, but it is a similar challenge although the speeds are even faster.

The experienced runner can usually run these distances relatively fast (above the lactate threshold) and for that you need a bit of speed in your training. Ideally you have a good foundation, and then you can add some speed in the weeks before the race to "sharpen up". Since the speeds can be quite hard I would recommend being careful and building gradually, just as with the 10k.

Good sessions: 5 x 1 km, 3 x 2 km, 6 x 800, 15 x 400

Sprint, middle distance and other disciplines

Sprint (400 m and below) is almost a different sport than long distance running, and middle distance (800-1500) is somewhere in between. Middle distance requires a balance of very high speed and good endurance, and is hard to get really good at. If you want to do this, I recommend finding an athletics club with a coach that can help you. There are also other distances you can do, such as hurdles and steeplechase and cross country.

Further reading

Books and podcasts

Some books I like:

- **Born to run**: a very entertaining book that started the barefoot running boom. I personally think it's not that much of a propaganda book (most of the people in it run in shoes) but people tend to focus on the barefoot stuff. It presents some scientific

ideas that are not very well founded so take it with a pinch of salt.

- **Löparglädje** av Rune Larsson - I don't know if there is an english version of this book but Rune is an ultra running legend and his book is very good and concrete for beginners.

- **Spring snabbare (Run faster)** by Andreas Almgren - A bit like a modern update to the previous book written by our biggest running star.

I also listen to a lot of running podcasts, but most of them are in Swedish: Maratonlabbet, Spring snyggt, Runners fm (in english), Spring med Petra, Pace on earth, etc.

References with more information about training

Apart from the books and podcasts I mentioned earlier you can also check out:

- If you are interested in running training in general, and the history of training philosophies I highly recommend Steve Magness on youtube (exv Evolution of endurance, och The lactate threshold). He's a runner, coach and author and very knowledgable.
- You can find lots of traditional wisdom in books like Jack Daniels running formula and Advanced marathoning.
- If you want hard marathon sessions, check out Renato Canova, a famous coach who pushes his athletes quite hard to great success (or great injuries).
- If you are interested in "the norwegian model", you can look up any interview with Marius Bakken (norwegian former elite runner who refined the system). He has been on pretty much every running podcast and channel there is since he wrote a book about it (called The norwegian method applied).
- The "norwegian singles" approach is covered a lot online (for instance here), and there is also a book (Norwegian singles method by James Copeland).

Final words

Running doesn't have to be complicated, but as you have noticed from the length of this short document, there's endless possibilities to make it as complicated as you want. In the end you are not an elite athlete (or why are you reading this?) and don't have to chase the absolute limits of human performance. You don't even have to run races or even run fast at all if you don't want to, but I think it's fun as long as you realise that it is just a hobby. We who don't have running as a full-time occupation can do exactly what we want, and do things that are fun rather than optimal. Drink beer, do fun workouts, run in nice places with nice people. Running doesn't have to take over your life and identity, unless you want it to.