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PHYSIOTHERAPY

Walking towards a healthy life

Facts and Myths about Walking as an Exercise.

Published June 29 2026 on the occasion of a talk about the benefits of walking as a physical exercise for the La Marina "Friends" association

Most of us walk every day. To the office, to the supermarket. Walking the dog. But is this beneficial? The question should rather be: Do I walk enough to get some benefits out of it? I really have difficulties to walk, is it too late to start now? And what can I do if I cannot walk because of my condition? Lots of questions we will try to answer on the following pages. But let's start from the beginning.

How it all started

Going upright was a long, evolutionary process and started well before homo sapiens stepped into the scene about six to seven million years ago. The way we walk today and nowadays' body proportions developed almost two million years ago when our predecessor homo erectus evolved and decided to go for a stroll round the block.

But as it happens, there is always someone nagging about. For instance those who claim that back pain is a consequence of us going upright. The evolutionary trade-off theory says that back pain is a common issue amongst humans because the evolution to walking on two feet is incomplete and still ongoing.

This statement if very arguable for various reasons:

- Six million years of evolution is a long time, even for evolution.
- If our musculoskeletal system were so bad there would have been more visible changes between our upright going ancestors and the modern human sapiens
- If walking on two feet were the main cause for the frequency of back pain in humans, animals such as dogs and horses would hardly suffer from it. But as any veterinary can confirm they do suffer from back pain, usually for the same reason humans do: Degenerative processes due to ageing, poor nutrition, lack of exercise and overload.
- In case of a four-legged individual, force distribution is similar to a bridge whereas standing on two legs distributes forces similar to a tower or a high building such as the Eiffel Tower. If you want to know which one is more complex, challenging to design and prone to failure, just ask an architect or an engineer.

Especially at the center of the bridge the generated forces are considerable and the structure needs to distribute downward forces towards both ends. Force distribution of a tower is much simpler but would become complex if it were meant to move.

To put it in a nutshell: Bipedalism works far better than some people want to make you believe. In fact, it is tremendously efficient. With the energy provided by a small tin of beans an average person can walk up to six kilometers. Try putting a tin of beans in the tank of your car: it won't even go an inch!

This efficiency was amazingly useful for our ancestors that had to cover considerable distances to gather or hunt food but it gets a bit in the way if you try to loose weight just by walking. Does that mean walking has no health benefits in modern times? No, there are lots of reasons why you should put on your shoes and go out for a walk!

Walking has loads of benefits, just to name a few:

- Long distance walking is positively related to **mental health**.
- Walking can be very beneficial for people with pain, especially **chronic pain**: Walking exercise significantly decreases pain in patients with chronic low back pain and significantly reduces its recurrence. A meta analisis published in 2015 recommends walking for patients with chronic musculo-skeletal pain. Walking is also recommended for patients who suffer from **fibromyalgia**.
- Walking may reduce loss of bone density in menopausal women and prevent **osteoporosis**.
- The impact of **osteoarthritis** in people who walk regularly seems to be less severe than in those who do not have this habit.
- People who walk regularly are less likely to suffer from poor **balance** and to develop an increased risk of fall.
- Walking on a regular basis is the number one strategy to prevent **cardiovascular diseases**.
- Walking prevents and reduces **lymphedemas**.

The picture on the left shows what homo erectus probably looked like. We know he walked upright just like Homo sapiens because the fossil records reveal they shared nearly identical body proportions and their preserved footprints show the exact same mechanical weight-transfer. We don't know anything about their hairstyle though.

Image source: https://www.britannica.com/topic/Homo-erectus/Fossil-evidence

All of these statements are backed up by systematic reviews and clinical trials that can be found on pubmed or cochrane. An exhaustive medical database search literally retrieves tens of thousands of articles and may give the impression that walking is a cure for everything. Unfortunately it is not! In spite of all its benefits, walking as a therapy has its limits. Often it is a great complement to other treatments but should not be considered a substitution for proper medical care.

However, these examples show that not only is walking beneficial for a wide range of conditions, it is also an important preventive measure.

Posture

Maintaining a good posture while walking will make your gait more efficient, contribute to a healthy walking style and reduce the risk of fall.

A good posture would look like this:

Keep your head up

Look forward and don't look at the ground right in front of you unless it is really necessary. Not only will this help prevent issues with your neck and preserve the natural curve of your cervical spine, this way you will also identify any obstacles much earlier. This also means you shouldn't be looking at your mobile phone. Use your walk for having a mental break.

Relax your shoulders

In moments of threat many animals use strategies to protect their neck. In case of humans this consists in raising shoulders and bringing them forward. Boxers, wrestlers, grapplers and other martial artists do this consciously, but in moments of stress we all do this without being aware of it. This becomes a problem when stress is long-lasting or permanent. The muscles involved are not meant to maintain this contraction for a long period of time. If they do, they will get hard and ring the alarm bells of our body. Many of these muscles are connected to the back of our head which is why many people suffer from neck pain or headache when they are under stress.

Disconnecting from your everyday business and paying attention to your shoulders every now and then while you walk may contribute to reduce or even eliminate these issues.

Swing your arms

With every step you swing one leg forward and thus create a rotational force, a momentum. This would make our gait look like after an extensive bar crawl. But thanks to our arms we usually move in a straight line forward because they swing in the opposite direction: As you move your right leg forward, your right arm moves backwards and the left one moves forward, the sum of all these moments equals zero. To put it simply: The movement of our arms eliminate the momentum of our leg. When you walk slowly these movements are hardly noticable but as you push the speed button they get bigger Usually you swing your arms without thinking about it but some people don't, especially after a longer period without proper walking after an injury, or illness. Just check your arms from time to time but do not try to constantly monitor your arm movements - you will mess it up, it works best when left alone.

Tighten your belly muscles

The job of some of our muscles is to keep everything together and our body in shape. These muscles are called tonus muscles or postural muscles and most of them sit well below the visible, outer layers of muscles, They adjust their tonus (their tension) depending on what we do. One group of these muscles keep our bowels in place and, what's even more important, distribute load equally in our back. This muscle group is commonly known as 'abdominal girdle muscles. As you walk the tonus of these muscles will increase and as you speed up it will continue to adjust. You can increase the tonus on purpose and thus improve your posture by pulling your belly button inwards/upwards whenever you remember.

Bend your knees

A slight bend of 5 to 10 degrees at the moment your heel touches the ground is the most efficient way to walk. This way your your thigh muscles act like a spring. Part of the energy is stored and released making your gait very efficient and decrease the impact on our hip, knee and ankle joints. Just as with swinging your

arms you will usually do this naturally, but sometimes, due to health issues, this movement may be altered. If your gait feels smooth and fluid the angle of your knees when you strike the ground should be alright. If it feels "hard" or you have a sensation of instability the moment you touch the ground this may be because you lock in your knees.

Heels first

Put the foot on the ground heel first and start to roll it until your toes touch the ground. When you push off with your feet your toes, especially the big toe, will be extended or dorsiflexed. Through some smart engineering nature did on our feet during the last five million years this little and seemingly superfluous detail plays an important role to maintain our foot arch so that the ball of our foot can give us that little extra push to get a smooth and seamless motion.

If you have difficulties to maintain a propper posture, don't get obsessed with it, your posture may improve over time. Try a bit of mindful walking and instead of focussing on specific features of your gait, try to make it feel smooth.

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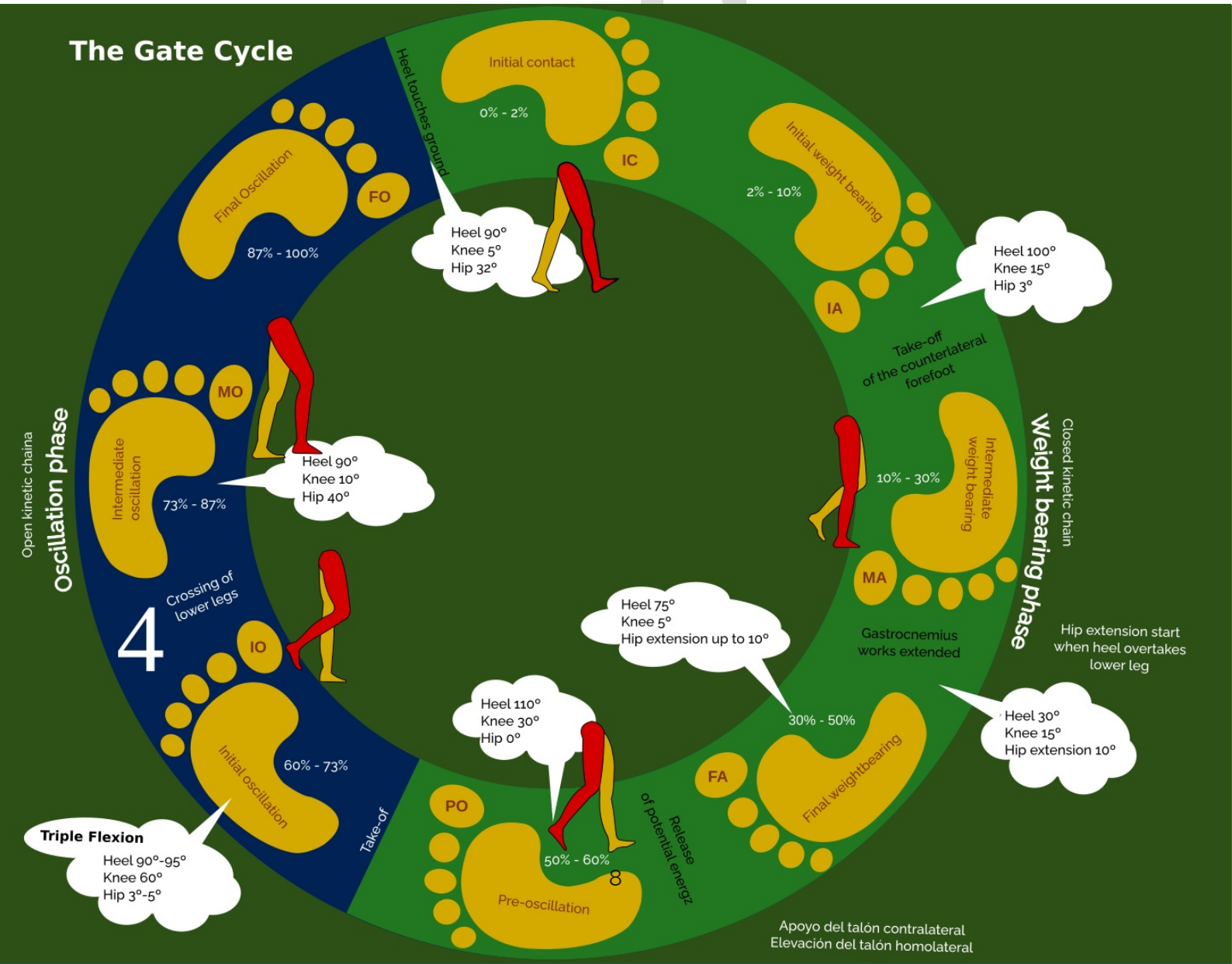
Gait

The way you walk is known as "gait". Although the basic mechanics are always the same, everybody walks a little different. Every legs cycles through eight positions each of which fulfills a specific purpose. They can be grouped into two different phases, the weight bearing phase and the oscillation phase. The whole thing is called 'Gate Cycle'.

Gait stabilizers

The job of the muscles around the hip and the legs is not only to provide the required movements to make you move forward, many of them also act as stabilizers. In an ideal world we would execute always the same sequence of movements but as you probably may have noticed, we do not live in an ideal world. There is wind, an uneven ground, sudden events like cars that decide not to stop at the zebra crossing, dog droppings that you see last second or a sound that makes you turn round. Fortunately you do not have to think about any of these things, you adapt to it unconsciously. There are also quite a few muscles whose job it is to cater for the little extra movements that are necessary to keep you on track and avoid any unnecessary ones. These muscles are generally referred to as stabilizers. They all work together and if some of them become too enthusiastic or too lazy doing their job it will have consequences for the quality of your gait. There are a few exercises that will help adjusting these issues.



Exercises to get prepared

There are a few things you can do to improve your gait with therapeutical exercises.

As we walk our feet tend to point outward. As long as this is in a range of about five to ten degrees there is nothing wrong with it but more than that will put stress on your knees. In order to correct this you can lie flat on you back with your knee flexed. Put a plastic ball between your knees, squeeze, count until four and realease the pressure. Do two series of ten to twelve repetitions every day for a couple of weeks.

There are many reasons for knee pain. It can be really tricky to figure out the reason. However, in case of knee issues it is always a good idea to train your quadriceps muscles (the thigh muscles) because they act as knee stabilizers, especially the internal portion. Take a chair, sit down and get up. Yes, these are the good old squads but the chair acts as a stopper and makes it a bit easier. Another way is to stand with your back facing a wall. Put a plastic ball between your lower back and the wall and move down and up. You can adjust the difficulty by moving your feet further away from the wall. If you want to specifically train the portion of your vastus medialis that is most important for getting the job done you can do balance exercises with unstable platforms or just standing on one leg.

If you suffer from flat feet there are a few exercises like bringing a towel towards you with toe flexion or picking up marbles. This activates and strengthens the flexor muscles of your toes, especially of the first toe which plays an important role to maintan the arch of your foot.

If you feel unstable it is a good idea to make a timed up and go test. All you need is a chair with backrest, something that serves a mark on the ground a measure tape and a timer. Your will also need the help of another person. Put a mark on the ground, three meters away from the chair. The other person takes the time and tells you when to stard. Sit with your back against the chair, arms resting comfortably, and feet flat on the floor. On the word "Go," you stand up and walk at your normal, safe pace to the 3-meter mark, turn around, walk back to the chair, and sit down.

The required time is an indicator of basic mobility and fall risk for adults. Repeat this test three times and use the best score out of three.

- Less than 10 seconds: Normal. Completely independent and highly mobile.
- 10 to 12 seconds: Indicates mild mobility issues and a slightly increased risk of falls.
- 13 to 15 seconds: Indicates a moderate risk of falls.
- More than 16 seconds: Indicates a considerable risk of fall and you will need professional help to address this issue. You should not walk on your own.

There is more to it and a physiotherapist will also take into consideration more factors such as your movement patterns as you get up, walk and turn around to make a more detailed assessment, but the time alone already is a quite relieble predictor of falls.

If you scored between 10 and 13 seconds you can work on your stability by yourself. One of the best ways to do so is — guess what — walking. This is the tricky bit: On the one hand, as you walk you expose yourself to falling, on the other hand, if you don't walk, your condition will probably get worse.

My advise: Reduce both the risk of a fall and its possible consequences by carefully picking where you go.

Intensity is key

On the occasion of the Tokyo Summer Olympics in 1964 a japanese watchmaker company launched a new product, the Manpo-kei which means "The ten thousand steps meter". The ten thousand step myth was born. Many people who use fitness trackers still think nowadays that they get enough movement if they do their ten thousand steps. Although counting steps is considered by many health professionals a good strategy to track a healthy lifestyle there are a few important arguments against it. The most important one is that it does not say anything about intensity. There is a huge difference if you make 5000 steps when you go from shopping window to shopping window on a Saturday morning and the 5000 steps that separate you from your gate at the airport when your name echoes through the airport just after "last call for passenger...".

Intensity is key, but how do your measure it? There are basically two approaches. The first one is simply chosing a track and measure the time from the start to the end. The advantage of this method is its simplicity. You can compare results and track progress between walks just by comparing times. It also is dead easy to calculate your speed. The downside is, it gets boring to always walk the same way. Plus, you are bound to keep walking with constant intensity if you want to get comparable measures. But what if you want to stop for a while to observe that squirrel on the land line or the sunset, or if you meet a friend and want to have a quick chat? And more importantly, if you want to throw in a few other exercises? You could of course pause your chronometer but the method will still not tell you much about the impact of your exercise on your body.

For the second method you will need a pulsioximeter or a fitness tracker. A pulsioximeter is a little device you can buy online for about 10€ to 15€. You put it on your finger and it shows the saturation of oxygen in your blood (SpO2) and more importantly your heart rate. Unless you have certain respiratory conditions you can skip the SpO2, the interesting bit is the heart rate which is shown as beats per minute (bpm). For a bit more money your get a fitness tracker. They look like watches or wrist bands and provide heart rate as well. Do not spend much money on these. There are fairly cheap trackers from well-known brands that provide accurate heart rates and this is all you need.

Your goal is to spend a certain amount of time with a certain heart rate. For example you want to spend 20 minutes with your heart rate between 95 and 100 bpm. You check your heart rate every few minutes and if it is too high or too low you adjust your speed. With the pulsioximeter it takes a bit of practice to get proper values as you go because it is designed to be used at rest. You won't have this problem with a fitness tracker.

The advantage of this method is that once you have a bit of practice you can create your own little programme. For example you start with a certain bpm for 5 minutes, then raise to a higher one for 15 minutes, hold a peak value for 3 minutes, go back to the previous value and then back to rest with the initial value. This sounds complicated but it isn't at all. Plus: without much hazzle it provides good information on what your metabolism is up to.

There is also a bunch of more or less sophisticated apps that track your physical activity. There is nothing against using them. However, if you track your activity and vital constants manually you will quickly develop a far better understanding of what's going on in your body.

Fifty ways of Walking

No idea if there are fifty ways of walking, but it makes for a nice title. At any rate, there is a whole bunch of variations. Do you remember when you were a child and stepped into the center of each other tile, just for fun? or walked on a line on the floor, or a small wall, just because walking straightforward was too boring? All these variations help children acquire and improve balance, movement patterns, strength, and from time to time a bit of blood on your knees. As an adult you can do exactly the same. You should also have an eye on your risk of fall before you start doing funny things (because you want to skip the blood on your knees - or anything worse). All this makes walking more fun and add health benefits to your daily walk. So instead of just walking "the normal way" from the start to the end you can throw in a few minutes of doing something different.

Japanese walking

It has got its name due to the fact that it was developed by researchers at Japan's Shinshu University. It simply consists of alternating three minutes of intense, quickly paced walking and three minutes of relaxed walking for 25 to 30 minutes. The idea is similar to High Intensity Interval Training (HIIT) but at a lower intensity and its benefits are well studied and pretty well backed up by scientific evidence. Because many people won't be able to maintain the relatively high intensity of a fast paced walk the three-minute-recovery intervall was introduced. A walk with this method provides similar health benefits as a fast non-stop walk but is much more bearable.

Instead of switching to a relaxed walk during the recovery phase you can do any of the following variations.

Increasing your step width

Voluntarily Changing Step Length or Step Width Affects Dynamic Stability of Human Walking. This is the title of a paper published in 2013. The title says it all.

"Raising your thighs" and "Heel to butt"

These are popular warming up exercises for football players and usually done as you run. But it can also be done walking. For the first one you raise your knee as high as you can with every step, for the second one you bring your heel as close to your glute as you can. These exercises dynamically stretch your thighs, improve range of motion and strength throughout the whole range. They also improve balance.

Walking the line

A line on the ground is always an invitation to play around with it. And they are all over the place, the joint between two lines of tiles is all you need. The simplest thing is to walk on the line as if you were balancing on a rope. Try to not look directly at your feet but a few meters further away and just check from time to time if you are still on the line. If you want something more challenging you walk criss cross. Stand next to the line and cross it with the foot that is further away. Then swing your other foot over and cross to the other side.

Walking sideways

There are different ways to do it, either joining your legs or crossing them. But no matter how you do it, by walking sideways you exercise some of those muscles that are important for stability like the fascia lata tensor and the adductor muscles.

Walking backwards

This is a good way to force you to pay attention to what your legs and feet do which also helps with the quality of your movement. Depending on your fitness and the surroundings you may do it on your own but it is best to have someone for support and safety.

Walking with your eyes closed

Closing your eyes is the best way to challenge your balance. The reason is that together with the vestibular system and propioception it provides the necessary information to the central nervous system to keep balance. If you remove one of those three sources of information, in this case the eye sight, the remaining two must work harder to do the job. For obvious reasons you shouldn't do this on your own.

Mindful walking

This is basically barefoot walking on different surfaces where you pay attention to every single step. Usually done at slow speed. Especially for people who suffered twisted ankles in the past, this can be helpful to reduce the risk of recurring sprains. Before, it was thought the instability after a twisted ankle was due to torn or stretched ligaments but there is evidence that the actual cause are changes in our propioception. Because of these changes our Central nervous system has difficulties to figure out what's going on and how to react propperly to sudden events - an uneven ground, a small stone that gets in our way, a branch you unadvertedly step on, etc. The input provided by mindful walking helps the CNS to re-adjust and interpret the altered input correctly.

Water walking

While walking on the beach is not good for everyone because of the slope towards the water and the extra load that the lose sand puts on your lower legs, walking in the water has quite a few positive effects and is especially useful for people with an elevated risk of fall. It challenges balance, is an excellent strengthening exercise and gives your CNS a lot of input to chew on.

Other activities during the recovery phases

But instead of alternating your walking "modality" you can just as well do other low-impact exercise. Going along a wall? Do some wall push-ups. A park with some grass to sit on? Do some stretching. A staircase? do plyometric exercise or just take them all the way up.

Motivation

Getting started is not difficult, the tricky bit is not to give up after a few days. A very simple trick is to go together with a friend. This creates a compromise and may be more appealing for many people than just walking alone. In general terms making it fun and appealing is the best way to keep you going. A good strategy is also to keep track of your exercises on a calender. Put it on your fridge or somewhere on the wall. Yes, there are hundreds of tracker applications for your mobile phone. However, I personally find it more rewarding to put in the data by hand on a piece of paper. It is a little bit like those chocolate advent calendars you can buy before christmas just without the chocolate - although the idea of having a bit of chocolate as a reward will probably sound appealing to a lot of people.

Dopamine is a neurotransmitter which plays an important role in acquiring motor skills, especially learning repetitive movements. But it also plays a central role in our reward system. It is liberated each time you succesfully fulfill a task and basically makes you feel satisfied..

This brings us to the next suggestion: create rewards. Make deals with yourself like: "After two weeks of sticking to my daily walking routine I will reward myself with the purchase of those wireless headphones I always wanted but had no excuse to buy". This brings long-term rewards into play. Combining short-term and long-term rewards bridges the gap between immediate gratification and lasting success.

However, there are also things that do NOT work as motivators, such as thinking of the health benefits. Yes, you probably decide to start taking up walking for health reasons but this decision is made up somewhere in your pre-frontal cortex of your brain. But what you really want, what you really, really want is a shot of dopamine! And you don't get a dopamin rush out of wise thinking.

The same goes with standing in front of the mirror. Changes in terms of body shape take a long, long time to become visible. And these changes will be small and slowly sum up to bigger changes, so you need to be very patient until you see the resembly of Brad Pitt in the mirror. But your brain's reward system wants to get its dopamine right now! So, skip the mirror and the scales, at least at the beginning.

The best time for your walks

There are no general rules. In summer avoid walking when it's hot and the sun is high up in the sky. This sounds obvious but you see lots of people on bikes, walking and even running during the hottest time of the day. Do not underestimate the risk! A report published by the Spanish Ministry of Health says that 3.832 people died due excessive heat between May and September 2025. Don't be one of them.

Equipment

None. There is no specific equipment required for walking. If you wanted you could go for a walk barefoot and nude. You probably won't get very far before you get stopped by the local police - but technically it is possible. So better jump into your shorts, throw over a shirt, slip into your shoes and off you go. But don't forget to protect your head, especially in summer: a cap, a hat or if you prefer, a turban. It is up to you.

Clothing

Prefer comfortable clothes, bright colors will add some safety and hopefully prevent you from ending up under a lorry. Keep in mind that you are going to sweat even if it is not much. For many years cotton was the recommended type of fiber for sweaty workouts but nowadays polyester is commonly used precisely because it repels water, does not absorb moisture, dries quickly, supports many washing cycles and is cheap. The downside: as most synthetic fibers it quickly gets smelly. Depending on intensity and how much you sweat synthetic fibers may not be the best choice, so try out different options and decice what you are most comfortable with. Before you rush into the next shopping mall to buy your outfit, use what your wardrobe already has to offer. Most importantly, don't forget something to protect your head!

Street shoes with a solid sole are a good option

Do not use flip flops. Not even in summer. Not even for a beach walk

Barefoot shoes are good for people who are used to walking barefoot. Give your feet and legs time to adapt and start with shorter distances.

Running shoes are good but should be not older than a year before they are replaced

Shoes

Don't use flip flops. Don't use worn out foot wear. The exact properties of the best possible footwear for you is highly individual and depends on your gait, i.e. the way you walk. Of course, weight plays a role as well. If you buy shoes for the purpose of walking and you have no specific gait issues, don't spend lots of money on fancy shoes. Experienced, long-time runners usually prefer mid-priced shoes and change them frequently. These are far better then top-notch but old ones. You get decent shoes for walking in a price range of 35€ to 50€. It is better to buy a pair of shoes for 40€ and replace them after eight months than spending 100€ and wear them for a two years. Changing your shoes every eight months may sound exagerated but let's do us a bit of number crunching: If you go 3.000 meters every day, four times a week, that is 12km a week or 625km a year which can be translated to roughly 875.000 steps! The good news: you do not have to change your cap every eight months, because you are going to wear some head protection, don't you?!

Music

Listening to music can be very motivating but has its downsides. Make sure you can still hear surrounding noise, especially from traffic. If you are so lucky to walk in nature it is well worth switching off the music and listen to the sounds that are all around you.

Gadgets

Probably the most useful items in terms of safety are reflective bands for wrists, arms and ankles. Another important safety item is a whistle. It can be heard over a long distance and will help draw other people's attention if you need help. It may also deter muggers.

You will need something to keep the few things you take on your walk. For shorter walks a waist bag for your keys, documents and mobile phone is enough. A small rucksack may be a better option for longer distances because it has enough space for a water bottle, some biscuits and a few more items.

There are many other gadgets your can take on your walk, but no matter what you are going to use, don't forget a cap or something to protect your head.

Drinks

Water. Don't use "energy drinks", they are poison. Don't spend money on any sort of overpriced, overrated Super-Iso-What-Not-Drink. Just drink water. You don't need to drink on short walks, drink before you go and afterwards.

Mozzies

Unfortunately, some of the nicest places for a walk are infested by mosquitos and they are usally most active during the best times of walking in the late afternoon. Put some anti-mosquito cream on.

Sun screen

Yes. Depending on your skin-type, even if you avoid the hottest hours in summer, you should still put some protection on your arms and legs, at least at the beginning.

Head protection

Just in case I haven't mentioned it yet: Protect your head!

How to get started

There are two things that are key to successfully get started: Keep the threshold as low as possible and start small.

Low threshold

This simply means that you should make it as easy as possible for you to do your activity. If you first need to have a shower, put your fancy clothes on, meet someone else, get into the car to drive twenty minutes you will very soon be tempted to "leave it for tomorrow".

It is far better to start your walk close to where you live, just on your own and with simple and comfortable clothes.

Start small

Overload, especially of the tibial muscles, is a common issue. Start with a shorter distance and avoid steep slopes. The distance at the start is very individual and depends on your previous physical activities. It is ok to start of with one kilometer or even less and then slowly build up.

Avoid steep slopes at the beginning

Walking over flat land can be boring but give your leg muscles a few weeks to get used to a load that they didn't previously had to bear with.

Do not compare your performance to others

Especially at the beginning there may be huge differences between your performance and that of people who have been doing this for a while. Both for your motivation and for your health it is far better to compare your performance today to that of your previous days. For this reason it is a good idea to start on your own or with a partner you know that walks at the same speed and intensity over the same distance before you actually join a bigger group.

Listen to your body

Wooo, this sounds very esotheric. But in fact it is the best way to improve the way you move, detect early any issues (pain, overload, etc.) and get a feeling for your body. This helps you to know what you can expect from your legs in terms of distance and intensity and plan your progress.

If you detect any issues - lower the intensity and duration of your walks for a few days. If that does not help, take a rest. If you are still having issues, see a physiotherapist who has some experience with gait.

Keep track of your progress

As mentioned earlier, motivation is important to stay on track and tracking your progress is one of the best motivators - and easy to do. It is also important if you are planning to prepare for a bigger project such as the 'Camino de Santiago'.