

Introduction to Running for the older adult (>50)

Originally published 27 February 2021 · fatchfitness.com



This blog article is a practical “To Do” for those older adults (40 and above) who are interested in starting up running but are a bit concerned about the potential impact of running on knee & lower back health.

1. Why running is good for you?

As a species, we have been running since we first stood upright many 10,000's of years ago. In fact one of the advantages Humans had over other species was our capacity to run for extended distances/times allowing us to run down prey that otherwise we would not have been able to capture.

There are many benefits of running, including:

- Improved aerobic capacity (improved cardiovascular fitness).
- Improved bone density (skeletal impact is key to improving bone density in the ageing adult).
- Improved mental health/fitness – being outside exercising has been shown to produce endorphins that generate a sense of well being.

- Weight control – depending on how you run and where you run, you can burn a lot of calories in a short time frame (which you can't do as well with walking alone).
- Improved muscle /tendon /ligament /joint strength and suppleness.



2. Why running mightn't be good for you?

- Due to the physical demands of running (in particular the level and volume of single leg impacts undertaken with running), some people have certain ailments that can result in pain and increased damage if running is continued
- Some people have cardiovascular issues that would make it unsafe to exercise with a high cardiovascular output (eg high blood pressure, previous cardiac issues, etc).



- Knees in particular are quite prone to excessive loading during running (particularly due to the development of highly shock absorbing shoes that lead to many runners to run heel-toe rather than on their mid-foot) resulting in much of the force being directed straight up the leg through the knee joint then hip/lower back region (see below section on Running Shoes)
- Some people just find exercising alone too boring, or they are in an environment where they are unable to run outdoors safely or on poor surfaces (more on that shortly) or they have to run on a treadmill which can be quite boring and also depending upon the quality of the treadmill can be quite bad for your joints (as well as teaching bad running technique due to the ground moving under you rather than you having to run across the ground)

3. Running shoes?

- I previously outlined my concerns around running and modern day running shoes in this blog article (<https://fatchfitness.com/ground-reaction-forces-grf-and-running/>). There has been a huge emphasis placed on developing shoes that have higher and higher levels of shock absorption capabilities (particularly in the heel section of the shoe). An issue with this design is that it leads users of these shoes to wrongly assume that they can safely run in a heel-toe manner which results in much of the load of each step bypassing the very strong ankle joint and the first joint that this load runs into is the vulnerable knee joint.
- As a most recent personal example, I purchased a pair of quite advanced running shoes and found that the high heel structure was resulting in my ankle moving laterally upon ground contact (even with a mid-foot landing). This resulted in an unfamiliar lateral stress being placed upon my Achilles tendon with each impact and a resulting tendonitis in this tendon. Once I went back to my old, flatter shoes, the Achilles issue settled down with no further problems.

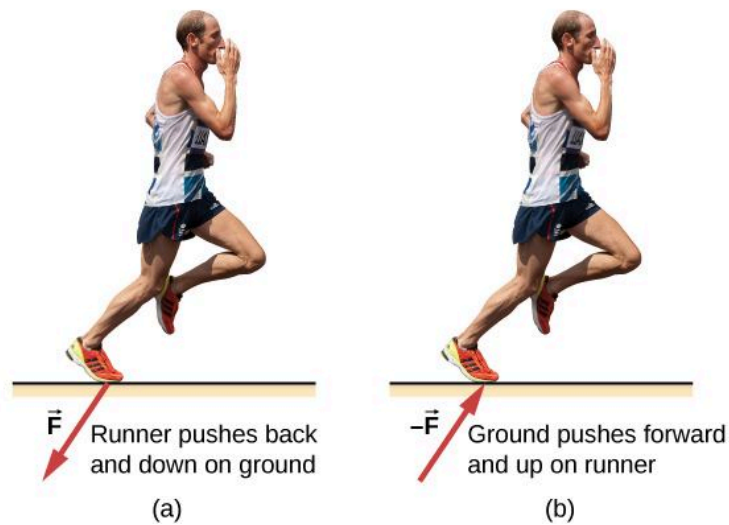


- I am not saying that you shouldn't purchase a good pair of running shoes, I do stress that you shouldn't buy the prettiest shoes in the store, ensure that you have an appropriate foot/gait analysis completed and you are matched up with the correct shoe type for your foot type.

4. Running surfaces.

This is a big reason why so many older adults have either given away running or after trying it think that it isn't for them.

A bit of biomechanics to start with; Newton's 3rd Law states "For every action, there is an equal and opposite reaction" – practically this means that depending on the force that you apply to the ground with each step, that amount of force is then potentially forced back up your leg with every single step you take. This is scientifically known as "Ground Reaction Force" (GRF).

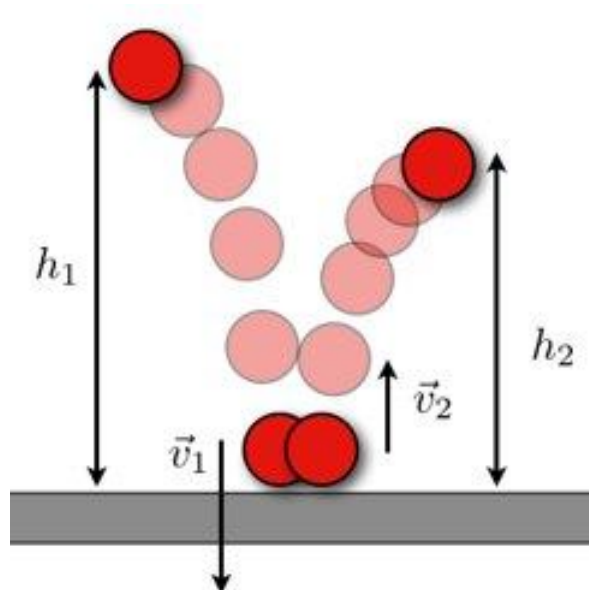


This is where your typical older trainer gets into trouble, if their running mechanics aren't good, if they spend too much time running heel-toe and/or they run on inappropriate surfaces, this will exacerbate the GRF being forced back up the body – running into the knee, hip and lower back.

Of particular concern to me is the amount of people who when they go for a run will run on the pavement (concrete!!!). Of all the surfaces you can run on, the hardest one by far is concrete. Bitumen is slightly softer, off road trails even better, grass is great and sand offers the most shock absorption but due to the amount of give is not a great surface (as you do need some opposing forces to make the exercise functional).

I often use the example of dropping a golf ball onto different surfaces:

- Concrete – The ball will rebound almost back to its original drop height
- Bitumen – there is about a 75% rebound
- Compacted Dirt – about 40-50%
- Grass – 10-20%
- Soft sand – 0-5%



So for anyone who is looking to take up running or wants to ensure they maintain joint integrity and are able to continue to run into their old age, it is very important that you stop running on concrete & bitumen and spend the majority of your running time on softer surfaces which will dull some of the impact force being generated with every step you take.

There is another modification we can make to any running routine that will further reduce the stress placed upon the joints giving the body the time to make the appropriate adaptations to develop the appropriate joint tolerance and that is early on in your running program to focus on running uphill as much as possible with potentially downhill and flat sections of the course being walked.



The reasoning behind this is two-fold:

1. As there is an upward gradient, each step taken will travel a shorter distance to the ground resulting in a lower GRF at each contact (less load forced up each leg), and
2. Running uphill requires more muscular & cardiovascular involvement – key reasons for running in the first place, so you can get these benefits whilst reducing the potential downside of too many and too high impacts with flat ground and in particular downhill running (which results in increased GRF as you are now falling further with each stride increasing the loads being placed upon the knee, hip and lower back joints).

Downhill running also typically causes the runner to run heel toe, removing the strong ankle joint from the movement further increasing the forces up the legs into the main leg joints (knee, hip).

5. Running volume.

Depending on many of the above variables, running technique, shoes, surface, the amount of running volume you do is also directly related to how well your joints will tolerate this exercise.

If you are efficient, wear good shoes, run on the right surface you can most likely get away with quite a bit of volume but the moment one or more of these factors are not being appropriately addressed, then too much volume will quickly lead to overuse issues and potential tendon and joint pain.

As a rule of thumb, I am a big believer in keeping the volume low and intensity higher even for the older adult – which can be achieved by focusing on the uphill segments of any run with increased speed/intensity during these segments and a lower speed/intensity on the downhill parts.

This will maximise your cardiovascular and muscular adaptation whilst reducing/minimising any joint degradation from excessive GRF during your running sessions.

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