

We have weaker bones than our hunter-gatherer ancestors – this is what you can do about it

November 22 2018, by Karen Hind, Charlotte Roberts



Credit: AI-generated image ([disclaimer](#))

Technology is continuously advancing to make our lives "easier", more efficient and often more sedentary. All of this has an impact on our body and, specifically, our bones.

Loss of bone strength is one of the least talked about risks of sedentary lifestyles, but is arguably one of the most important, with [osteoporosis](#) related fractures occurring in [one in three women and one in five men](#). There is a direct relationship between the [lack of oestrogen after menopause](#) and the development of osteoporosis.

As a society, we are more sedentary than ever before. The use of transport, electric rather than manual bikes, and having our weekly grocery shopping ordered online and delivered to the comfort of our homes are all at odds with keeping active. Children in particular are less active – with computer games replacing "playing out" during a crucial time of development when exercise (especially jumping) can optimise bone strength gains by up [to 5.5% over six months](#).

Research is also demonstrating that what's known as "epigenetic memories" may also be [passed down several generations](#), which means that our lifestyle today could influence gene expression in future generations. If sedentary trends continue, humans are at risk of becoming frailer and more dependent – needing increased support from already stretched health services.

The science

Our skeleton has many roles: it supports our body, provides attachment points for muscles, tendons and ligaments that enable our bodies to move, and stores minerals like calcium and phosphorus. However, when external forces and demands are removed, our muscles can waste, and our bones become lighter, less dense and less "useful" – this increases the risk of osteoporosis and fracture.

A loss of around 3% of cortical bone in the leg, for example, can occur [during one month of bed rest](#), and in space, astronauts can [lose over 10% of their bone strength](#) on a typical 120-180 day mission. This is because

of the absence of loading to the skeleton in the microgravity environment.

[Our current ongoing research](#) shows that sedentary time is a risk factor for reduced bone strength in middle age. Reduced activity after retirement and sitting for prolonged periods of time, are shown to be the main factors as this removes functional stimuli to bone – as does letting robotics and machines take over tasks we used to do for ourselves.

On the other hand, when bone is "loaded" through various forces, it responds by becoming stronger. This is evidenced by numerous exercise [intervention studies](#), and [previous research](#) shows around 20-30% greater [bone strength in athletes](#) from "impact" sports – such as football, hockey and running – [compared to non-athletes](#).

Lessons through time

Analysis of bones from over hundreds and thousands of years ago suggests that our skeleton today is more fragile than that of our ancestors, and the differences [became more pronounced](#) when humans started to farm their food (domesticating animals and plants).

Before this time, humans foraged wild plants and hunted animals. They were much more active than their descendant farmers, ate leaner meat, and were more often than not, "on the move". Research has found that their bone mass [was around 20% greater](#). A decrease in leg bone size and changes in its cross-sectional shape are also evident at the advent of farming. This reflects changes in loading on the skeleton due to the [different activities people did](#).

Research also suggests that prehistoric women in the Neolithic, Bronze and Iron Ages had around 5-10% more arm bone strength than [modern female athletes](#), indicating heavy use of their arms for specific activities.

This suggests modern humans are falling short of their bone strength potential.

What you can do

Simple exercises and lifestyle changes that are similar to activities of a hunter gatherer can help build bone strength. Interval training and sports including bouts of fast sprinting such as football, along with lifting weights can help. But it doesn't have to be all about going to the gym, simple changes like using a rucksack when walking and shopping can increase loading to the spine.

Do your own food shopping as often as you can, and carry your own shopping bags to provide some loading to the arms and back muscles – and also indirectly to your legs (and all related bones).

Walk more often and further and with your dog if you have one. Park your car further away from work or the shopping centre, take regular walking breaks at work and at home and hold walking meetings or practice social walking with family and friends. Aim to use the stairs instead of escalators or a lift and try to take two stairs at a time to get a glute and quad work out while loading the bones at the hip joint.

Regular gardening and having a vegetable plot or even an allotment can offer similar advantages, as can doing housework vigorously. And if you have a wood burning stove, chopping your own logs goes some way towards mimicking how our ancestors prepared their kill and building materials for shelter.

These small changes can help to build bone strength – which is vitally important given that the number of people aged 50 years and over with a high risk of [osteoporotic fracture](#) was 158m in 2010 and is [projected to double by 2040](#) globally. And while increasing life expectancy may be

part of the explanation, lifestyle habits unfavourable to [bone](#) health and [strength](#) are also a large part of the problem.

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