



DO YOU TAKE YOUR BALANCE FOR GRANTED?

THE FIRE FIGHTERS CHARITY

How often do you think about where your place your limbs? Many of us take it for granted, but when you suffer with balance issues, every foot placement can be a struggle. Senior Exercise Therapist **Rachel Rees** is here to explain what we can do to improve our balance.

Many of us take it for granted that we can find our balance. We move around without thought, effort or fear of falling. That is, until we lose our ability to balance. There are two different reasons why people may lose their balance: after injury or with age. But why do these factors affect our balance?

To understand why we lose balance, first we need to understand what balance actually is.

Balance is the body's ability to achieve a state of equilibrium through an equal weight distribution. Sounds easy enough to understand, right?

But there's also a word you may not have heard before, which is key to understanding why we lose balance. And that word is proprioception, which means the sense of knowing where your specific body parts are within a specific environment.

For example, while walking on uneven ground on a stony beach, you need to sense where your ankle is while walking. Proprioception allows your

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body to respond to stimuli and control your limbs without having to consciously think or look at them. So while walking on a beach, your body places your foot in a certain way while navigating the stones to stop you from turning your ankle and injuring yourself. Proprioception information includes an ability to detect joint position, movement, direction, amplitude (the extent of your range and quality of movement) and speed of motion.

As this is something most of us do without even thinking, it can be a tricky concept to understand. But when you lose balance, you become acutely aware of your proprioception.

Now we understand what governs our balance, we can begin to understand why injury or age may lead to a loss of balance or proprioception.

LOSING BALANCE AFTER AN INJURY

When we injure a joint in our body, our proprioceptive skills can be weakened. For example, if you roll your ankle and sprain your ligaments, your proprioceptive capabilities may reduce, so you may experience an unstable sensation in the joint and your ankle may give way seemingly without structural reason. But why?

A decreased sense of proprioception through a trauma (ie. an injury) can be caused by tissue damage in that particular area, the presence of oedema (swelling) or increased nociceptive inputs (pain). In turn, this reduces our proprioceptive capabilities, which is our body's natural way of trying to protect the injured joint by not preventing us using it. This is helpful in the short term, but not when we need to start using it again.

In the meantime, your brain sends electrical contract or relax messages to your muscles, as your joint movement response is detected by your sensory nervous system, which continually reports back to the brain for fine tuning and improvement. After injury, these messages can become distorted so are less clear.

That's why it's so important to retrain your balance and proprioceptive reaction after injury, so you are more able to adapt to stimuli and transition back to subconscious movement decisions. An efficient subconscious proprioception and balance system is important in everyday life, especially for sport. For example, if you're a runner wanting to get back to running on even ground after injury, you don't want to be constantly thinking about your foot placement. You want it to become normal and automatic, so you don't need to remove speed to increase your focus.

BALANCE AFFECTED BY AGE

As we age, our sensory feedback — which is detected by our muscles, tendons and joints — slows down. The contract and relax messages being sent by the brain become slower and just aren't as clear. The less good your balance as you get older, the more likely the risk of falls and injury. So it's important we focus on balance training to deal with underlying causes.

Our sensory feedback, detected by our muscle's tendons and joints slow down as we age, the contract relax messages become slower and just aren't as clear. Balance problems in older people increase the likelihood of falls, which is why it's so important to focus on balance training.

Let's take a look at some of the underlying causes that affect our balance as we age, so we can begin to deal with those we can.

LOSS OF MUSCLE MASS

As we get older we naturally lose muscle mass, but this doesn't wait until we're elderly to happen. Known as sarcopenia, this process begins in our thirties with weakened muscles compromising our ability to remain steady on our feet.

Alongside sarcopenia, many of us tend to be less active and spend more time sitting down as we get older. Whether it's desk jobs or sitting down more in retirement, evidence shows that over half of older adults spend four or more hours a day sitting down. This number is likely to have been even higher over the last few months as so many of us self-isolate at home to prevent the spread of the coronavirus.

But being sedentary leaves us at risk of various health conditions including obesity, Type II diabetes, cardiovascular disease, increased risk of pain and stiffness and, as we've discussed, poor balance and an increased risk of falls.

The phrase 'use it or lose it' is key here. If we don't regularly challenge our

balance, strengthen our muscles and move our joints, our musculoskeletal system (ie. our muscles and bones) will become weak and deconditioned.

The good news is that you don't need to be a serious gym-goer to be active and there is a difference between being

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physically active and exercising. Rather than think about spending time exercising, think instead about reducing the amount of time we spend sitting down. Being active is key to keeping healthy and maintaining independence. The Chartered Society of Physiotherapists (CSP) have developed a brilliant 'Love Activity, Hate Exercise' campaign to help get people moving (and not just for our older population).

Balance-strengthening activities are not exclusive to recovery from an injury, they should be just as much a part of your routine as cardiovascular or strengthening exercises. If we can keep our muscles nice and strong, we can activate them quickly and prevent falls.

OTHER FACTORS THAT CAN AFFECT OUR BALANCE IN OLDER AGE

Long-term medical conditions that affect the nervous system such as Parkinson's, Alzheimer's and MS all have an affect on our balance.

Postural hypertension, a drop in blood pressure when you rise from a bed or chair that causes light headedness can make you feel dizzy and disorientated, which in turn affects your balance.

Nerve damage in your feet (neuropathy) is a long-term side effect often seen in conditions such as diabetes. If you can't feel your feet you are more likely to trip over them.

Some medications (like some antidepressants) can cause side effects such as dizziness, which may cause a person to become off-balanced and fall.

Like injury, arthritis or joint problems cause painful, swollen and stiff joints, which can cause our body to go into protection mode to try to prevent us from using it. This causes reduced sensory input and proprioception deficiency.

Cardiac conditions and renal problems can all contribute to unsteadiness. For example, both health conditions can cause fluid retention in the ankles, which can distort feedback information and reduce your proprioception.

Our balance can also be affected by our psychological state. After a fall, we can

become fearful of falling again, so we limit our activities and may become isolated or depressed to a lower self-esteem, which can cause physical decline.

Visual cues tell us a lot about our environment, as our eyes help us to see and prepare for potential dangers and obstacles. Have you ever tried to balance with your eyes closed? Older people may have deteriorating eyesight, which can affect their balance and cause them to become unsteady.

People with hearing issues may also struggle with their balance, as the inner ear contains a fluid-filled, semi-circular canal that tells us the position of our head and its movement in space in relation to gravity. (It's a bit like a spirit level you might use in DIY, but for our own body!) Degenerative hearing issues such as vertigo, labyrinthitis, BPPV or Meniere's disease can all affect someone's balance.

HOW DO WE IMPROVE OUR BALANCE?

Balance-strengthening activities are not exclusive to recovery from an injury, they should be just as much a part of your routine as cardiovascular or strengthening exercises. Proprioception exercises are required to improve your proprioception feedback circle and improve your balance. You can re-teach your body to control the position of an injured or deficient joint.

The good news is that they're not particularly complicated. For example, if you stand in a narrow stance with one foot in front of the other, or you stand on one leg and hold it for a while, that's you taking part in proprioceptive and balance exercise.

As you progress, you can work equipment into your activities, to further challenge your balance. You could create an unstable surface like a wobble board or balance trainer, or even use make-shift options such as standing on a rolled-up towel or standing on a hot-water bottle (using cold water, and not too full). The unpredictable movements that these types of equipment creates progressively re-educate your body to quickly react to the wobbly movements without having to think about them too much.

To make these exercises even more challenging try closing your eyes. The wobbly feeling is your body making balance adjustments based on feedback from proprioceptors located in muscles tendons and joints.

Remember practice makes permanent. You will get better at whatever you practice every day and this will eventually mean perfect proprioception! 🎯



The in-house rehabilitation programme offered by **The Fire Fighters Charity** is currently unavailable due to the Covid-19 pandemic but will be accessible once again to mountain and cave rescue team members, via the Rescue Benevolent Fund, when guidance permits.



TO FIND OUT MORE, GO TO **FIREFIGHTERSCHARITY.ORG.UK**. TO ACCESS THEIR SUPPORT LINE, CALL 0800 389 8820