

# PREVENTING ANKLE SPRAIN THROUGH IMPROVED PROPRIOCEPTION

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## OBSERVING GOOD TRAINING

A key concern for all runners is how to avoid injury during training and competitions. Whilst observing good training principles and ensuring regular and targeted stretching can go a long way to keeping a runner injury-free, an often neglected yet important area of concern is proprioception. Runners who develop good proprioception will be more likely to avoid injury, and specifically ankle sprain, particularly when running on uneven terrain.

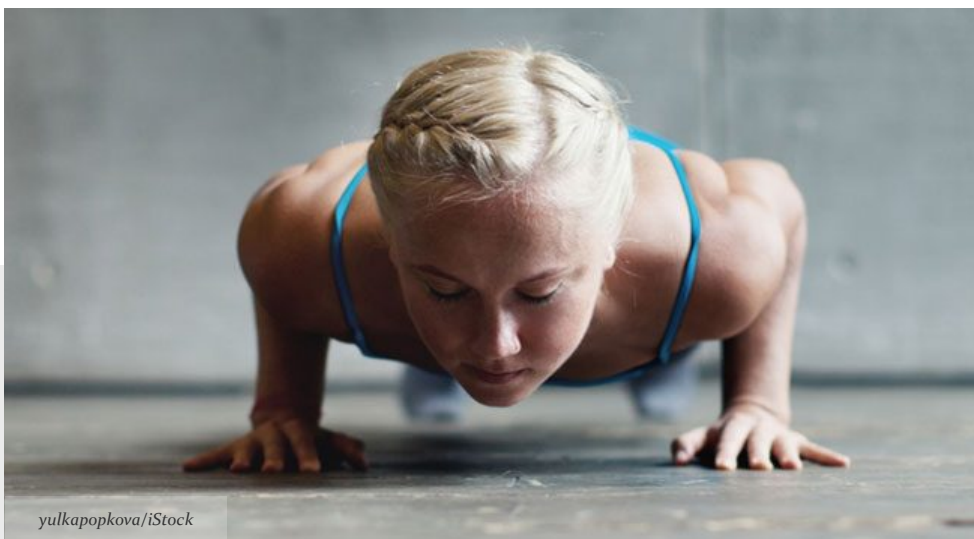
### What is Proprioception?

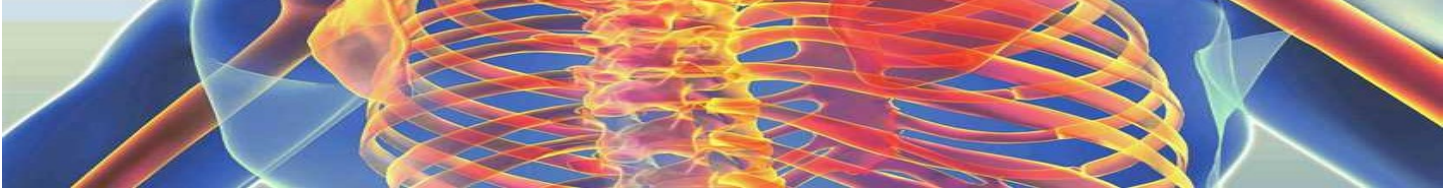
Proprioception is the sense that enables the brain to orientate where the body's limbs and joints are in space.

Specially adapted nerve-endings are located in joint capsules, ligaments, muscles and tendons which detect the position of the joints and any change in tension within tissues.

This information is then fed back to the spinal cord and brain and the brain is able to use it to control the body's movements. In addition, the vestibular and the visual systems send information to the brain which helps it to orientate the head in relation to its surroundings. The eyes will also provide information for the brain regarding terrain, such as the pitch and camber of the ground, the location of obstacles and how slippery the ground surface is.

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Good proprioception is important for runners as it can reduce the risk of sprained ankles. It improves the ability of the body to control its own motion according to the terrain it is running on, and respond effectively to changes in terrain, preventing damage to the ankle by avoiding excessive joint movement. It is an inability to sufficiently control the motion, and detect changes in terrain, which increase the chance of the runner rolling over on the ankle when on uneven terrain.

An ankle sprain is often a long-lasting and potentially recurring injury. A sprained ankle is one in which fibres within the ankle ligament are torn to varying degrees. The more extensive the fibre tear, the more severe the injury. A high risk factor for spraining an ankle is having sprained an ankle previously, because a sprain will damage the proprioceptors in the ligaments and the proprioception in the ankle will be negatively affected in the future.

The good news is that by performing some simple balancing exercises, runners can dramatically improve their ankle proprioception and therefore greatly decrease the risk of injury and, where relevant, re-injury.

Therefore, even if you are a runner who has not previously sprained their ankle, you may benefit from performing ankle proprioception exercises.

### **Training your Proprioception**

Here is a series of exercises which can improve proprioception. I would recommend practicing the exercise for a minimum of ten minutes each day. The more you practice the exercise, the faster you will master it!

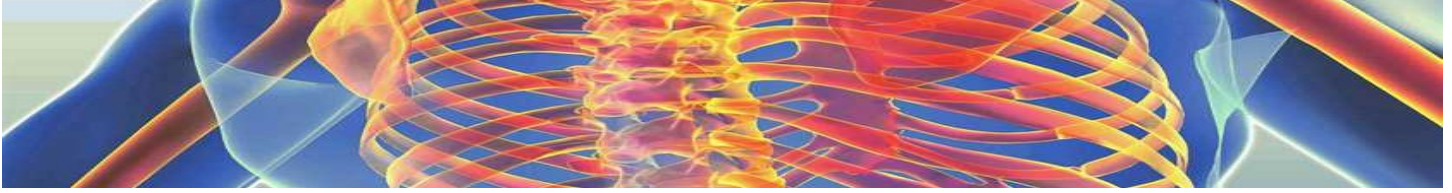
To test your balance, stand on one bare foot on a flat solid surface with your arms outstretched to the side. The lifted foot should be held just above the floor without touching the standing leg. You should be able to stand in this position without your body swaying from side to side or your ankle rocking from side to side. Your standing foot should be relaxed and you should avoid gripping the floor with your toes. Look for signs such as whitening of the nail beds or clawing of the toes! All parts of the sole of your foot should be in contact with the ground, and you should avoid lifting the toes off the ground or placing all of your weight on one part of your foot with other parts raised off the floor. Your weight should be evenly distributed across the entire sole of the foot.

If you can perform this task comfortably with your arms outstretched, try it with your arms crossed over your chest. It is more difficult in this position as you can no longer use your arms to balance. The same rule applies; you should be able to avoid body sway, ankle rocking and foot gripping.

It is useful to get a friend to give you feedback regarding foot gripping and contact with the floor. If you struggle with the eye-open exercises, pick a fixed spot on a wall in front of you. This will give your brain a reference spot in space which makes it easier to balance. As your balance improves, keep your eyes open but try looking around the room.

Once you are comfortable with the “open-eye” exercises, both exercises should then be repeated with your eyes closed.

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Performing the tests with your eyes closed, increases the challenge placed on the proprioception system and the vestibular system as you can no longer use your eyes to orientate your body in space. The ability to control your proprioception without your eyes becomes more important when you are running in poor light conditions. Also, runners do not always keep looking ahead whilst running, for example when taking a drink or looking at their watch. The “closed eye” exercises will help to improve the runner’s proprioception and ability to avoid ankle sprains during such moments.

Exercise Summary For 10 minutes a day, practice the following exercises. Only move from one level to the next when you are comfortable with the first. Stand on one bare foot at a time in the following positions:

Level 1: Arms outstretched, Eyes open

Level 2: Arms crossed in front of chest, Eyes open

Level 3: Arms outstretched, Eyes closed

Level 4: Arms crossed in front of chest, Eyes closed.

There are a couple of ways in which you can increase the challenge and the benefit which results from these proprioception exercises. Firstly, try hopping and landing on the standing foot on a flat surface through all four exercise levels. You could then try performing the exercises on unstable surfaces, such as a soft mat, a pillow or a wobble board. It is important not to move on to these harder versions of the exercises until you are comfortable with performing all four levels on a flat surface.

For those runners who have previously sprained an ankle, before attempting these proprioception exercises, it is advisable to have a full assessment by a manual therapist, such as an Osteopath, with experience of treating sports injuries. They should examine joint mobility within the foot, ankle and the knee, strength and flexibility as well as proprioception.

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