

The Doctor's comments

info@sportsclinicnq.com.au | www.sportsclinicnq.com.au

Neuromuscular training and why is it important? Why your brain is the reason you need knee surgery!

Many sport injuries are caused by an athlete's loss of protective mechanisms rather than due to trauma. Patients come to me often perplexed at how they suffered a serious ligament injury and say "no one even touched me". The reality is that's exactly how the vast majority of injuries occur. Watch this video compilation for some proof. Here you will see many season ending injuries requiring surgery, all occurring without any trauma.

https://www.youtube.com/watch?v=oQMOuV2_Y6A&feature=youtu.be

It may sound odd, but it is actually the brain that is largely responsible for these injuries. Joint stability is provided by many structures but in particular bones, ligaments and muscles. Bones and ligaments are important for joint stability but alone, are not enough. Muscles, not only move a joint but help protect it. When you suffer an ankle sprain or ACL rupture your muscles have failed to protect the ligaments and the ligaments have too much force place upon them resulting in a tear. The brain is extremely important in this process.

A large muscular frame and definition is often sought after by many. You only need visit a gym to see the effort that goes into getting the right look. But when a muscle fails to support a joint and injury occurs the failure is usually not that the muscle wasn't developed enough but was told to do the wrong thing by the brain. Studies have been done and shown that the average ankle sprain takes 0.08 seconds to occur. In 0.08 seconds your ankle is rotating at 1500 degrees per second. Similar studies have been done on the ACL. An ACL takes about 0.04 seconds to rupture and the ligament stretches about 9mm in this time before it fails. This means that the time for the body to recognise and react is extremely small possibly one or two hundredths of a second. Essentially you could have the "Dwayne the Rock" Johnson's muscles but if they contract a hundredth of a second too late then it is too late and an injury occurs.

After an injury the picture becomes even more confused. The brain seems to forget where the joints are and gets lazy sending messages to control the joint. This is why you are more likely to have another injury after the first. For this reason training the brain to recognise joint position and to actively participate in joint control is so critical. It also explains why strength training can be quite effective in reducing injury in healthy populations (who have normal brain / motor control because they have not been injured). Strength training on its own is very poor for rehabilitation purposes. Neuromuscular control is the term that medical staff use for the process of the brain controlling movement of the limbs. Optimal neuromuscular control is gained through training the brain with specific neuromuscular exercises. They must be done and practiced properly. Supervision will be required initially. They are critical to reducing secondary injury after an initial injury and provide promising results for preventing an initial injury from ever recurring.

So when your physio, exercise therapist or coach has you doing these weird balance or landing exercises, you need to understand that they really doing you some good, even if it doesn't feel like it at the time.



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