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Why do hamstring injuries happen so often and how can they be prevented?

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In a recent clash against the Melbourne Storm, the Brisbane Broncos endured a nightmare rarely seen in professional sport — three players tore their hamstrings in a single game. Two players, Adam Reynolds and Ezra Mam, went down in the same play.

Hamstring strains are the most common non-contact muscle injury in running sports such as rugby league. One in three players will suffer the same injury again.

So why do they happen and what can be done to stop them?

The Brisbane Broncos suffered three hamstring injuries in one game against the Melbourne Storm.

Hamstrings are a huge issue for athletes

More than 80% of all hamstring injuries in sport occur during sprinting, while others occur during stretching movements such as kicking.

The danger point is usually the "late swing" phase of sprinting: the split second before the foot strikes the ground when the leg is swinging forward at high speed.

At this moment, the hamstrings are contracting while also lengthening.

The hamstrings' job is to slow the leg and prepare it for ground contact. This requires very high forces at long muscle lengths — a combination that increases vulnerability to injury.

It is not just speed that is dangerous.

Using the recent Storm-Broncos game as an example, when Xavier Coates intercepted the ball, and Mam and Reynolds suddenly accelerated to chase him down, their hamstrings were actually stretched further and faster than if they were running at a steady pace, even at much higher speeds.

Think of your hamstrings like a rubber band: during constant speed running the muscles stretch gradually, but yank it suddenly (as during acceleration) and it stretches faster — making it more likely to snap.

In fact, accelerating while running at only half your top speed puts the same stretch on your hamstrings as running constantly at nearly 90% of your maximum speed.

How to reduce hamstring injury risk

While no strategy can completely eliminate risk, there is evidence that two approaches reduce hamstring injuries: sprinting and eccentric strength training.

Eccentric strength training involves exercises where the muscle lengthens under tension, such as slowly lowering a weight.

Eccentric training, particularly the Nordic hamstring exercise, can cut hamstring injuries by more than 50% when done regularly.

This exercise puts the hamstrings under high force while they are lengthening, triggering structural and functional changes that make them more resilient.

Regular sprint training may help protect against hamstring injury by preparing the muscles for the exact demands they face in competition.

But if athletes go long periods without sprinting, a sudden spike in sprinting load can greatly increase their risk.

Consistency is crucial

Eccentric training can lengthen muscle fibres within 2-3 weeks, mainly from stretching existing sarcomeres (tiny building blocks inside each muscle fibre that allow it to contract and stretch).

This short-term (two to three weeks) change may not provide much real protection from injury.

However, with longer-term training (around nine weeks), new sarcomeres are added, creating longer fibres that can better withstand the big stretches of sprinting.

This difference helps explain why short pre-season training blocks may be insufficient and why consistent eccentric training is needed to build lasting protection.

Eccentric training also increases strength by building the size of the muscles.

Bigger hamstrings are stronger and can cope better with the huge forces they face during sprinting.

These two changes — longer fibres and greater strength — appear to be the main reasons eccentric training cuts injury risk by half.

It's also possible other changes play a role, like the muscles switching on more quickly or the tendons and connective tissues getting stronger but research in this area is still limited.

Researchers have explored the effects of nine weeks of Nordic hamstring exercises.

Challenges for athletes and teams

The protective changes from eccentric training are not permanent.

Fibre length and added sarcomeres begin to regress within three weeks of stopping.

This is a major challenge in professional sport, where busy schedules and muscle soreness from eccentric exercise mean few teams stick with these prevention strategies in-season.

The good news is muscles quickly adapt to eccentric training, so soreness diminishes over time. Once players build up a tolerance to eccentric training, just four Nordic reps per week may be enough to maintain the protective benefits without overloading athletes.

Teams that consistently use these exercises experience fewer injuries than those that don't.

An issue that shouldn't be ignored

Even with world-class sports science support, hamstring injuries are still the number one cause of time loss from training and competition in professional football codes.

Predicting and preventing hamstring injuries remains a challenge. But eccentric strength training and regular sprinting can provide protection.

Effective prevention requires not just using eccentric strength training exercises but doing them consistently, alongside careful management of load, recovery and other risk factors.

Putting this into practice in elite sport is difficult, which may help explain why hamstring injury rates are not decreasing.