

Muscular skeletal research assignment

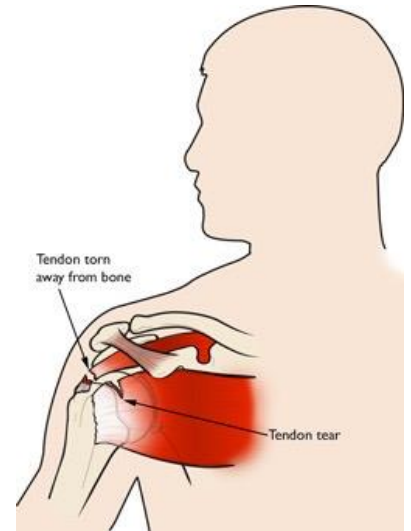
Overuse injury: Steph Rice

Injury: has inflamed all three joints in her right shoulder which developed into a minor torn tendon.

Cause:

Stephanie Rice's torn tendon in her shoulder was likely a result from her vigorous training schedule. She said she had known there was a slight problem in her shoulder for a couple of years but never really took much notice of it. However, as she was preparing for the commonwealth games and the 2012 London Olympics she had to increase her training load. As a result her rotator cuff on her right shoulder became inflamed. Steph didn't want to risk getting surgery as the olympic games were coming up so she kept going with her training schedule. At the end of her 15 week block of intense endurance training her shoulder had gotten worse and she suffered a tear in the tendon.

Steph's tear was a result of putting her shoulder under too much pressure and use. As a swimmer, her shoulder would have been rotating over and over again. Because of this, over time her rotator cuff suffered many repeated micro tears. Steph continued to swim with her injury, which caused her soft tissue surrounding her rotator cuff became inflamed and swollen.



Tendons are meant to be able to withstand repetitive movements. But when the load of straining or exercise is too high the tendon becomes very stressed. The micro tears that form stimulate inflammatory chemicals which cause swelling. If the swelling is treated and managed well by decreasing the training load or exercise, the injury will heal. However if training load continues lesions can occur and the injury can become even worse. In steps case this is what happened, which lead her to a torn tendon and a major set back from her swimming.

Torn tendons can occur in other ways as well. As people get older their muscles and tendons can degenerate and this is a common cause of a torn tendon.

Treatment:

If Steph had treated her inflamed shoulder earlier on by reducing her training load significantly and applying ice or heat regularly she could have prevented her injury from getting worse.

However Steph kept up with her intense training and did not treat the shoulder's problem. She did take a cortisol injection to help reduce the inflammation during her commonwealth games, but this did not significantly help her injury. After Steph had found out that she had torn her shoulder she went straight into surgery to repair the tendon. To do this she needed to undergo

arthroscopy surgery which is also called a keyhole surgery. The surgeon will try to sew the tendon back together. After the surgery, Steph was not allowed to swim for about a week and was only allowed to take part in some light dry land activities. She was also advised to complete about 6 months of physiotherapy and reduce her training load.



Prevention:

To prevent this injury, it is recommended that a proper warm up should be performed before any training session in order to warm up the body. Warm ups are extremely important for preventing any type of injury. This is because it gives the body time to gradually adjust to the exercise and slowly increases the amount of blood flow to the muscles. If no warm up was completed the body would not be as prepared to meet the demands of high intensity exercise. Stretching and strengthening is also important to prevent rotator cuffs from becoming inflamed. Strengthening will reduce the risk of developing injuries because it allows the body to be capable of dealing with and stress on the body. Stronger muscles and tendons will hold the body in better alignment and prevent joints during high intensity exercise.

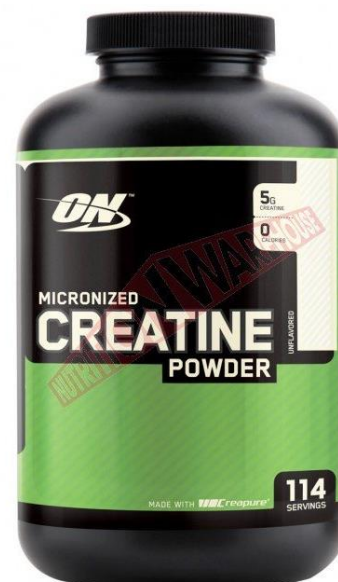
After training, if no cool down is completed and the shoulders are allowed to rest, there will be an increased amount of stress caused to the rotator cuff. Therefore a cool down or a massage will prevent this. Cool downs also work similarly to warm ups. However, they gradually allow the body to cool down. The heart rate is slowed gradually as well as the breathing rate and helps the muscles prepare for the next training session.



Enhancing performance

Legal performance enhancer: creatine

Creatine is a substance that is naturally found in the body. It is synthesised in the kidneys and the liver and mainly stored in the muscles. Its role is to donate a phosphate group to make the molecule ATP. ATP plays an extremely essential role in the human body because it provides energy for cells to complete their functions. Many athletes use creatine as a supplement to improve their athletic performance. Most creatine supplements are used in the form of a powder and taken orally



Perceived benefits:

Creatine supplements are used all over the world to enhance physical performance. Its main perceived benefits are:

- improved strength
- Increased muscle size: creatine increase the water content that is stored in muscles and therefore increases the size of muscles. It does not cause the actual muscle fibres to grow but gives muscles a more volumizing look.
- Increases the ability to work at a higher capacity: creatine provides muscle fibres with energy in the form of ATP, this means that if there is a higher content of creatine more energy can be supplied to the muscles allowing them to work at higher intensities.
- increases resistance to fatigue: creatine increases the amount of energy being supplied to cells and because of this more energy is supplied to brain cells resulting in less fatigue
- Speeds up recovery of muscles: creatine has been found to increase recovery by reducing the inflammation and damage to muscle cells, allowing for a quicker recovery.



Famous sportsperson who uses creatine: Tyson Gay

Tyson Gay is a 100 and 200 meter sprinter based just outside of Orlando. In an interview with 'Mens fitness' he told them that he takes a few supplements including krill oil, BCAA's and creatine. Tyson uses creatine to improve his athletic performance. It will supply more energy to the muscles so that he can keep pumping his legs throughout the sprint. The creatine will not increase his speed but improve his stamina throughout the race.



Perceived side effects and harms of using creatine:

Creatine is most likely safe if taken orally in small doses. However if high doses are taken it can pose some problems and could be unsafe. It has been suggested that taking creatine can put you at risk of kidney and liver disease, but no much scientific research has been done to prove this. Other side affects that can occur when creatine is taken in excess include nausea, headaches, stomach pain, muscle cramping and diarrhoea. Dehydration is also likely occur. This is because creatine draws water away from the rest of the body to the muscles. In order to prevent this lots of water must be drank along side creatine.

Ethical considerations:

Creatine can be beneficial for weightlifters, sprinters or other high intensity sports. But the effectiveness of creatine is yet to be proven and the list of side effects can be quite alarming. Because creatine doesn't have much scientific research to back its performance improving abilities, many people take the risk of using the supplement. There is also not much scientific research to prove the side of effects are related to creatine. And again this is why people must take a risk when using the supplement.

Other considerations include whether creatine is an ethical supplement to take. Some organisations have under taken research to discover the answer. The studies showed that because creatine is known to give some athletes an unfair performance advantage and it is therefore considered unethical.

Creatine can also be considered unethical because if creatine improves athletic performance and athletes are aloud to take creatine it can encourage these athletes to try illegal performance enhancing drugs. This is because athletes will then want to improve their athletic performance even more after using creatine and go after illegal drugs that will help them achieve their goals faster.

As of now, creatine is a legal substance that people can take to improve their performance. It can be compared to carbohydrate loading which is also legal because creatine and carbohydrates are both a naturally found substance in the body.

