



# *WHEN TO REMOVE A PLAYER FROM THE FIELD FOLLOWING A SPINAL INJURY – BASIC GUIDELINES*

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*Providing coaches, referees, players, and administrators with the knowledge, skills, and leadership abilities to ensure that safety and best practice principles are incorporated into all aspects of contact rugby.*

## **INTRODUCTION**

Rugby is a contact sport which often results in injuries to the spine. These injuries may occur following an acute event during a match, following repetitive trauma, or during training sessions. Injuries occur when a compressive force is applied to the flexed spine, or as a result of axial loading, repetitive hyperextension or rotation of the spine. Injuries may also occur as a result of a direct blow or improper tackling.

The neck or cervical spine is the bridge that connects the head to the trunk. The neck needs to be flexible enough to allow head movement, but at the same time stable enough to protect the spinal cord. It is as a result of this flexibility that the cervical spine is a high injury risk for a rugby player. If an acute injury to the neck is not managed appropriately, it may lead to a catastrophic outcome. The thoracic and lumbar spines are more stable than the cervical spine and therefore not as vulnerable to acute severe injuries as the neck. Repetitive trauma may however result in significant lumbar injuries.

## **COMMON RUGBY INJURIES**

### ***Sprain and strain***

Spinal soft tissue injuries include muscle strains and ligamentous sprains. These injuries occur as a result of mechanical overload of the paraspinal soft tissues. The diagnosis is made by localised pain and tenderness over the affected muscle or ligament with swelling, weakness and limited range of motion. Repetitive injury to the muscle and ligament may result in chronic tears, calcification and fibrosis. Acute sprains and strains are treated topically with ice, rest, non-steroidal anti-inflammatory drugs and occasionally by trigger point injections. These injuries can be prevented by teaching safe play techniques, by following a regular neck and back strengthening regime, and through adequate stretching before the game.

### ***Brachial plexus injuries***

These injuries are also called “stingers” or “burners”, as they cause a stinging or burning pain radiating from the shoulder into the hand. The injury usually occurs when the shoulder is depressed while the neck is bent to the opposite side, resulting in traction to the brachial plexus. The symptoms are usually transient. A cervical disc injury needs to be excluded. If the player has a pain-free range of movement of the neck with no objective weakness in the arm, he may return to play. If however there is localised tenderness over the neck with a limited range of neck motion and/or weakness of the arm, the player should be removed from the field as further evaluation is needed.

### ***Intervertebral disc injury***

The cervical or lumbar intervertebral discs may be injured during play. This occurs following axial loading and rotation. The player would present with pain in the arm or leg with associated neurological symptoms. The presence of any neurological signs or symptoms demand removal of the player from the field. There are a range of disc injuries, including annular tears, disc protrusions, and disc extrusions. The clinical presentation is similar in all groups but the definitive management is different.

### ***Spinal cord injury***

The spinal cord is most likely to be injured between the 4th and 6th cervical vertebrae. The majority of these injuries occur during scrums, high tackles or as a result of rucks or mauls. The severity of the injury may range from a spinal cord contusion, or neuropraxia, to complete paralysis. Players may be genetically predisposed to a spinal cord injury if they have a congenital fusion of two or more vertebrae, or a congenitally narrow spinal canal. Congenital spinal stenosis is present when the anterior posterior diameter of the cervical canal is less than 13 mm on lateral radiographs of the cervical spine. This value may be erroneous due to X-ray magnification. The Torg ratio is more accurate and is calculated by dividing the canal width by the vertebral body width on a lateral X-ray. This ratio is considered to be abnormal, or indicative of congenital cervical stenosis if less than 0.8. The Torg ratio should be used as a screening measure and if stenosis is suspected, the definitive diagnosis should be made on Magnetic Resonance Imaging (MRI). The player with a suspected or overt spinal cord injury should be taken off the field.

### ***Spinal fractures***

Acute spinal fractures are rare but may occur in a player who has a metabolic bone disease like osteoporosis. Fractures would occur as a result of a direct blunt injury, axial compression, hyperflexion or hyperextension.

Stress fractures to the lumbar spine are fairly common and occur as a result of repetitive hyperextension of the lower back. These stress fractures are often difficult to diagnose on standard X-rays and may require special tests like a Technitium bone scan or MRI.

### ***Dislocation***

Cervical spine dislocations can result in severe injury to the spinal cord, resulting in permanent quadriplegia. Dislocations may be divided into uni- or bifacet injuries. The uniface dislocation tends to occur when the hyperflexed cervical spine is rotated. A bifacet dislocation occurs when axial loading is applied to the hyperflexed cervical spine. Both these injuries require urgent appropriate specialist treatment. These injuries usually produce severe neck pain with a deformity of the neck. A uniface

dislocation will cause the player's neck to be rotated to the side and there may be neurological symptoms or signs in one arm. Bifacet dislocations often result in quadriplegia and urgent specialist attention is needed.

### ***WHEN TO TAKE THE PLAYER OFF***

Play should be stopped to permit careful assessment of the injured player. An accurate assessment is required before allowing the player to return to the field. The location of the spinal pain should be identified, as well as its radiation to the arm or leg. An enquiry should be made regarding the presence of neurological symptoms of pins and needles (paraesthesia), numbness, or weakness in the arms and legs. The spine should be examined for local evidence of trauma (bruising, swelling and tenderness) and the player should be asked to move his neck, arms and legs to assess limitation of motion, painful motion and loss of function.

The vast majority of injuries would be minor, requiring rest, ice and compression. The ice should be wrapped in a wet towel and applied to the injured soft tissue for approximately 10 minutes. The player should not return to the game if he reports any neurological symptoms in his arms and legs, or if he does not have a full range of pain-free spinal motion.

### ***WHEN TO REFER THE PLAYER FOR A SPECIALIST OPINION***

If any neurological symptoms or signs are present, the opinion of medical personnel (Physiotherapist or Doctor) should be obtained. If the player is unable to move, an assumption must be made that he has a spinal injury. If the player is unconscious, check the airway and make sure that he is breathing. If there is no spontaneous breathing, place him in a lateral (recovery) position, administer CPR and call for an ambulance or helicopter to transfer the player to hospital.

A specialist opinion may be sought for acute or chronic injuries. Acute injuries that require immediate specialist assessment include injuries to the spinal column (fractures and dislocations) and injuries to the spinal cord. These injuries would require X-rays and special scans plus appropriate treatment by a specialist orthopaedic or neurosurgeon.

Chronic injuries would include disc herniations and stress fractures. These players would typically develop recurrent symptoms with play and an elective or non-urgent specialist assessment is needed.

## **AUTHOR'S BIOGRAPHY**

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