

THE SOCIETY OF SPORTS THERAPISTS



Sports Trauma Management 8. Disability (including neurological deficit)

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To be covered within this section:

- Head Injuries
- Facial Injuries
- Spinal Injuries



Head Injuries

Learning outcomes

- Upon completion of this chapter, students should be able to demonstrate an understanding of the initial management of an athlete with a mild, moderate or severe head (traumatic brain) injury and the management an athlete with a concussive injury.

Objectives

- 1. Understand the clinical priorities, initial assessment and management of an athlete with a head injury.
- 2. Understand the clinical priorities, initial assessment and management of an athlete with concussion.
- 3. Understand the medical room assessment and management of concussion including post game day care and graduated return to play protocols.



- Primary Head Injuries
 - Destruction of brain tissue via axonal death
 - Cannot be modified by medical treatment
- Secondary Head Injuries
 - Failure to deliver oxygen and glucose to the brain & remove waste products
 - Preventable with medical treatment
- Head injuries are time critical
 - Mass lesion patients have only a 4hour window for treatment
 - THEREFORE: recognition of serious head injury with rapid extrication are essential



- On field Assessment
 - SAFE Approach
 - Airway
 - Breathing
 - Circulation
 - **Disability (including neurological assessment)**
- On Field Assessment
 - **A - Alert**
 - V - Voice
 - P – Pain
 - U – Unresponsive



Medical Room Assessment

- Glasgow Coma Scale
 - Maximum GCS of 15
 - Minimum GCS of 3
- GCS 13-15 = Minor Head Injury
- GCS 9-12 = Moderate Head Injury
- GCS 3-8 = Severe Head Injury (unable to protect airway)



Glasgow Coma Scale



	EYES	VOCAL	MOTOR
1	Not open	No response	No response
2	Open to P+	Incomprehensible sounds	Extension to P+
3	Open to Voice	Inappropriate words	Flexion to P+
4	Open Spontaneously	Confused	Withdraws from P+
5		Alert	Localises P+
6			Obeys commands



- Record the Players best score
- One point variation is non-significant
- Greater than 1 point is



- On field confirmation of concussion
 - U or P on AVPU (confirmed LOC)
 - Tonic-Clonic Posturing
 - Concussive convulsion
- Suspected concussion
 - Suspected LOC
 - Ataxia – unsteady on feet
 - Disorientated or confused
 - Dazed, dinged or had bell rung
 - Inappropriate behaviour



- Medical Room Assessment
 - Dependent on sport specific regulations
 - Refer to your governing body for more information



Key learning points

- Head injury can be classified as minor, moderate and severe
- Medical treatment is targeted at preventing secondary brain injury
- All patients with head injury should have full cervical spine immobilisation
- On the field of play, D or neurological assessment is performed by the use of AVPU
- All participants following a head injury who have an AVPU of V or less, should be extricated with spinal immobilisation from the pitch as soon as it is safe to do so
- For assessment of disability, or D in the medical room, the Glasgow Coma Scale is used
- Sports related concussion is a sub-type of traumatic brain injury
- A high index of suspicion for the potential for concussive injury is required
- Medical room assessment of the player with suspected concussion should use a standardised approach where possible
- Athletes with concussion should have medical follow-up
- The treatment of concussion consists of relative physical and cognitive rest
- Once the athlete is asymptomatic, he/she can begin a stepwise return to play.
- There is no same day return to play for an athlete diagnosed with concussion.



Facial Injuries

Learning outcomes

- Upon completion of this chapter, the candidate should be able to demonstrate understanding of the principles of initial assessment and management of facial injuries in sport.

Objectives

1. Identify the correct sequence of priorities for assessment of an injured athlete with facial trauma.
2. Apply the principles of the primary and secondary surveys to the assessment of an injured athlete.
3. Develop a systematic approach to the assessment of an athlete with facial trauma.
4. Employ correct management of soft and hard tissue injuries.
5. See expert assistance when further investigation or treatment is required.



- Facial injuries are part of the secondary survey
- Caution:
 - Patient with LOC
 - In supine
 - Significant facial fracture
 - Airway compromise !



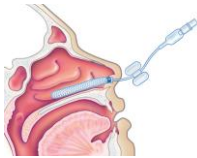
- Soft tissue injuries
 - Clean wound with saline
 - Haemostasis (Stop the bleed)
 - Close wound
 - Usually 3.0 vicryl with local anaesthetic
 - Aim to achieve optimal healing with minimal aesthetic or functional deficit





• Epistaxis (Nose Bleeds)

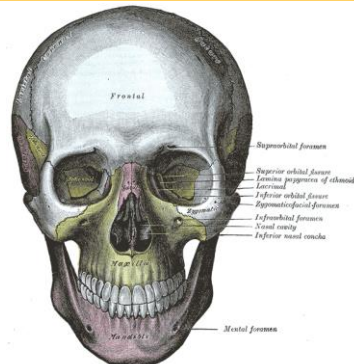
- Dental cotton roll (pre-soaked in dental anaesthetic)
- Rapid rhino or MeroCel
- Head forward
- Pressure to bridge of nose (not soft tissue)
- If bleeding is uncontrolled – refer to ED
- Check for septal haematoma
 - Avascular necrosis



Hard Tissue Injury

• Examination

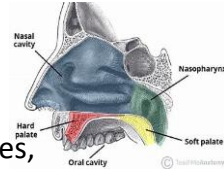
- LOOK
 - Asymmetry, Bruising, Swelling, Missing tissue, Foreign body
- EYES
 - Eye movement, Pupil reaction, Hyphema
- NOSE
 - Tenderness, Deformity, Air movement, Septal haematoma
- EARS
 - Lacerations, Swelling





Mouth & Jaw

- Check
 - Tongue, oral cavity including hard and soft palettes, mandible and tempromandibular joint (TMJ)
- Le Fort Fractures



Le Fort I



Le Fort II



Le Fort III



Facial Fractures

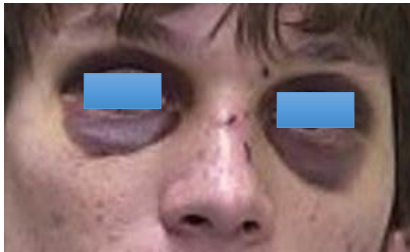
- ORBITAL FRACTURES
 - Retrobulbar haemorrhage can appear up to 5d post inj
 - Proptosis – eyeball pushed forward
 - Ophthalmoplegia – paralysis of eye muscles
 - Disproportionate amount of pain
 - Reduced visual acuity
- EMERGENCY
 - Blood in retrobulbar space
 - Sight threatening





• BASAL SKULL FRACTURES

- Periorbital Ecchymosis
 - Also known as Panda Eyes/ Raccoon Eyes
 - 2-3d delay in presentation



• ORBITAL FLOOR FRACTURE

- Ecchymosis (Bruising)
- Lower of pupils
- Enophthalmus – posterior displacement of the eye
- Diplopia
- Reduced eye movement





• MEDIAL ORBITAL FLOOR FRACTURE

- Epistaxis
- Subcutaneous emphysema
- ENOPHTHALAMOS – posterior displacement of the eye
- Horizontal diplopia



ZYGOMATIC FRACTURES

- Circumorbital ecchymosis (bruise)
- Epistaxis
- Subconjunctival haemorrhage (blood shot eyes)
- Diplopia
- EN or Exophthalmos
- Infraorbital anaesthesia
- Deformity
- Reduced jaw movements
- Subcutaneous emphysema





MANDIBULAR FRACTURE

- Step deformity
- Loss of arch form
- Malocclusion of the jaw



Mandibular Fractures:

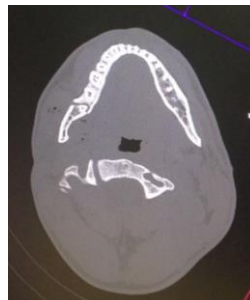




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AVULSED TEETH

- Put back in the socket ASAP (<2hours)
- Do NOT touch the nerve root
 - Do NOT CLEAN the tooth
- If unable to put back in socket
 - STORE in SALINE or MILK
 - NOT WATER



Key learning points

- Identify the correct sequence of priorities for assessment of an injured athlete with facial trauma
- Apply the principles of the primary and secondary evaluation to the injured athlete
- Develop a systematic approach to the assessment of an athlete with facial trauma
- Employ the correct management of soft and hard tissue injuries
- See expert assistance when unsure of the diagnosis and treatment



SPINAL INJURIES

Learning outcomes

- Upon completion of this chapter, candidates should be able to demonstrate the assessment and management of an athlete with a suspected spinal injury in the Immediate Care in Sport setting.

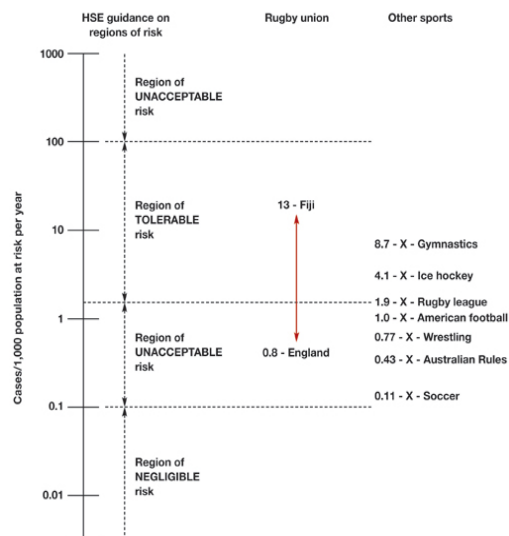
Objectives

1. Understand the importance of spinal injury.
2. Understand how to recognise a spinal injury.
3. Understand how to assess and manage a spinal injury.
4. Understand the principles of spinal immobilisation.
5. Be proficient in the use of spinal immobilisation devices.



SPINAL INJURIES

- Epidemiology is approximately 0.8/1000 hours in English Rugby





Pathology

- C4/5 & C5/6 most commonly injured in rugby union
- C1/2 (e.g. odontoid peg fractures) may also occur
- Vertebral fractures can be stable or unstable
- Dislocation or subluxation (bi or unifacetal)
- Acute disc prolapse
- Early closed reduction in bifacet or unifacet dislocations with spinal cord compromise (<4 hours) have better outcomes



Secondary Pathology

- Obstructed airway
- Reduced pulmonary ventilation
- Hypovolemia (neurogenic shock)
- Impaired vascular supply to the cord
 - Direct pressure from fracture or dislocation
 - Oedema



Mechanism

- Axial loading/compression
- Hyperflexion or extension
- Excessive lateral flexion
- Hyper rotation
- Distraction



Signs

- Central neck/back pain
- Deformity of column
- Paralysis
- Numbness/ P&N
- Heavy limbs
- Neurogenic shock (radial pulse?)
- Respiratory difficulty or arrest
- Diaphragmatic breathing (belly)
- Priapism



Assessment

- SAFE approach?
- A
 - MILS or Anterior Hold
- B
 - Oxygenate & Ventilate
- C
 - Neurogenic Shock
 - Sympathetic NS damage = reduced vascular tone
 - Blood pooling in extremities (Hypotensive and warm)
 - ? Fluid therapy



Assessment

- Disability
 - AVPU
 - If below A, suspect spinal
 - If A can assess
 - NEXUS
 - Dermatomes
 - Myotomes
 - Movement



National EXradiographic Utilisation Study

- Mechanism of injury
- Reduced GCS
- Distracting injury
- Neck pain
- Neurological signs
- Posterior midline tenderness
- Rotation **greater than** 45° R&L
- Flexion & Extension



• Dermatomes & Myotomes

Dermatome		Myotome	
C6	Thumb	C6	Elbow Flexion
C7	Index & 2 nd Finger	C7	Elbow Extension
C8	Little Finger	C8	Finger Flexion
T1	Armpit		Thumb Extension
L3	Inside Knee	L4	Dorsiflexion
L4	Patella/ big toe	S1	Plantarflexion
L5	Anterior Shin		



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CERVICAL COLLARS

- Reduce ROM
- BUT do NOT provide absolute immobilisation
- Use in conjunction with MILS or head blocks
- Size from upper traps to angle of mandible
- Use sizing line on collar



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- Sizing for collar



Immobilisation Devices

- Long Boards
 - Require 90° log roll
 - Can lead to pressure ischemia with long travel times (>45 minutes)
- Split Boards
 - Require 2 x 15° tilt only
 - No pressure ischemia
 - Suitable for players up to 159Kg
 - X-Ray lucency
 - Narrow (<47cm)
 - Require a vacuum mattress for long transfer times (>45mins)



• Long Boards





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First person on scene secures the neck with either:-

- MILS
- Anterior Hold



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Positioning of the log roll team:

- 3 people stood in height order (tallest to shortest)
- Overlapping hands
- 3 over, 3 under
- Roll towards you



Person on the head gives the instructions
“ready, brace, roll” to 90°



Once the patient is log rolled to 90° another member of the
trauma team should bring a long board in to support the patient



Once the long board is in place, the person in MILS can instruct the team to lower the patient down on with the board as support.



Don't worry if your patient isn't perfectly aligned with the board – we can adjust them

- To slide them down, place two hands above the shoulders and have someone hold around their hips
- To slide them up, place two hands under their arms and again have someone on the hips
- Slide to the diagonal corner



Next step is to secure the body using the straps provided:

- **N**ipples
- **N**uts
- **k**nees

Secure in this order!

You may want to use a Fig 8 around the feet for taller players



Once the body straps have been applied, you should secure the head:

1. Use the anterior hold to replace MILS
2. The person in the MILS position can hold the head blocks, squeezing them in and down against the head, to secure them to the back board
3. The forehead and chin straps can now be loosely placed
4. Person in the MILS position can tighten the straps by pulling on both ends of the head strap together & securing, then the chin strap
5. It is important the chin strap sits under the collar & the patient can still open and close the mouth

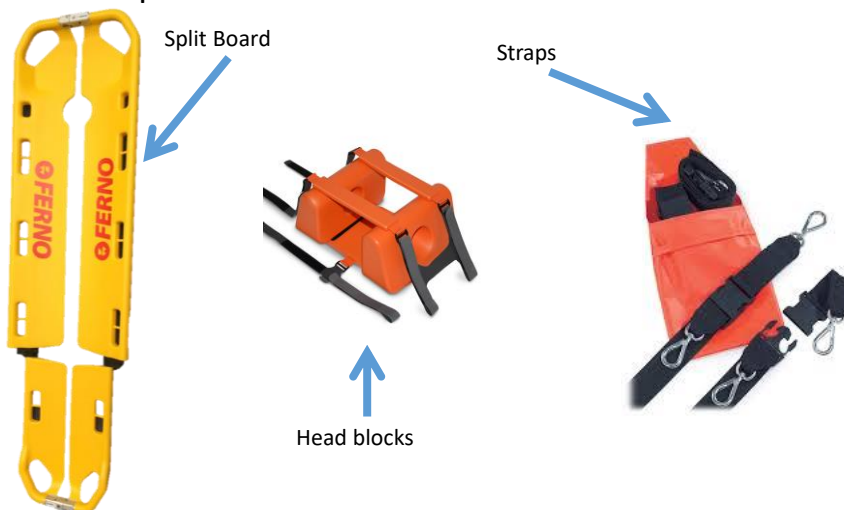


To extricate the player off the pitch to the medical room or awaiting ambulance:

1. You will need a minimum of 6 people
2. Stand them in height order, from tallest at the head to shortest at the feet
3. From a kneeling lunge with a secure grip the person at the head instructs the team to "ready, brace, lift"
4. The patient is walked off feet first
5. The instructions "ready, brace, lower" should be used to lower the patient at the destination or if re-adjustment is required.



• Split Boards





1. Size the Split board against the patients height.
2. Split the board by releasing the metal clips at the top and bottom of the board.
3. Use the same log roll technique used in the long board
 1. 3 people, overlapping hands, 3 over, 3 under
4. ONLY roll the patient to 15°
5. Insert the first blade with the Ferno head board attached
6. Lower the patient on to the blade
7. Switch sides ready to insert blade 2



Once the second blade is in,
two people will need to clip the
scoop together at the head and
feet





Attach the body straps

- Nipples
- Nuts
- kNees

Then attach

- Head blocks
- Forehead
- Chin straps



Vacuum Mattress: Gold Standard Spinal Extrication





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Advantages:

1. You can hold the patient upright
2. You can turn the patient on their side



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Stingers

- Intense, painful, unilateral, neurological event
- Upper roots or trunks of the brachial plexus
- C5-T1
- Pathology
 - May result in
 - Neuropraxia
 - Axonotmesis
 - Neurontmesis



- Mechanism
 - Lateral side flexion
 - Compress or traction the nerve
 - Depression of shoulder
 - Traction of nerve
- Usually
 - C5/6 nerve root or upper trunk
 - Test via:
 - shoulder abduction
 - Shoulder external rotation
 - Elbow flexion
 - Sensory Sx usually resolve within seconds
 - Motor Sx may persist



Key learning points

- •The ABCs still apply as a priority in patients with suspected spinal injury.
- •The spinal injury patient presents specific problems during assessment and intervention.
- •Manual in-line stabilisation must be maintained from the moment of first contact with the patient until immobilisation has been achieved with board, head blocks and straps or it is judged that immobilisation is not necessary.
- •If in doubt, immobilise.
- •Correct preparation for transfer to definitive care with appropriate documentation and communication with the receiving hospital.
- •The techniques for moving and immobilising players with suspected spinal injuries must be practised regularly by the medical team and helpers.