Acute Management of Sports Injuries

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Where is the Injury?
Before the Game

Preparing to play

Fail to prepare, prepare to fail!
There are a number of factors that should be considered before taking part in sport to reduce the risk of injury to the player. The player must be physically, mentally and technically prepared before participating. Equally important is the role of the coach, the medical team and the officials to ensure the game is played safely and injuries are dealt with properly and quickly. In this chapter we consider how everybody involved should prepare.
Approach to the Injured Player

- **Assume the worst** – every injured player should be approached as having a serious injury until proven otherwise

- **Basic resuscitation** – ABCs
  - **Airway** – ensure player’s windpipe is not blocked
    - E.g. Swallowed tongue / Inhaled blood or teeth
  - **Breathing** – ensure player is able to breathe normally
  - **Circulation** – control any obvious bleeding
    - Apply direct pressure to wound site
Three Levels of Injury Priority

- **First Priority**
  - Injuries that pose an immediate threat to life
    - Airway obstruction / Cardiac arrest / Uncontrolled bleeding

- **Second Priority**
  - Urgent injuries that are potential threats to life or limb
    - Head injury / Spinal injury
    - Serious limb injuries with blood vessel / nerve injury

- **Third Priority** *(Thankfully the most common type!!)*
  - Mild limb injuries – sprain / strain
  - Cuts and bruises
Concussion

- A brief period of unconsciousness followed by complete recovery

- Brain is “shaken” in skull

Soccer is a contact sport!!!!
Causes of Concussion

George Bush delivers illegal, but gratifying right hook to opposing ball carrier.

Concussion

- All head injuries are potentially serious
  - Remove player from pitch

- Injuries may be associated with damage to the brain tissue or blood vessels inside the skull

- Player should be regularly assessed for signs of deterioration
  - e.g. worsening headache, drowsiness, blurred vision

- If you are not happy – bring player to A+E
### Sport Concussion Assessment Tool (SCAT Card)

#### The SCAT Card (Sport Concussion Assessment Tool) Medical Evaluation

<table>
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<th>Name:</th>
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<td>SportTeam</td>
<td>Mouth guard? Y/N</td>
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#### 1. SIGNS
- Was there loss of consciousness/irresponsiveness? Y/N
- Was there seizure or convulsive activity? Y/N
- Was there balance problem/unsteadiness? Y/N

#### 2. MEMORY
- Modified Maddocks questions (check if athlete answers correctly)
  - At what venue were we? __________ Who scored last? __________
  - Which half is it? __________ Did we win our last game? __________

#### 3. SYMPTOM SCORE
- Total number of positive symptoms (from reverse side of the card) __________

#### 4. COGNITIVE ASSESSMENT (5 word recall)

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**Immediate**

**Delayed**

*Months in reverse order: Jan-Dec-Nov-Oct-Sept-Aug-Jul*

#### Digits backwards (check correct)

- 5-2-8 __________
- 6-2-4-8 __________
- 8-3-2-7-6 __________
- 7-3-9-1-4-2 __________

#### Ask delayed 5-word recall now:

#### 5. NEUROLOGIC SCREENING

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<th>Pronator drift</th>
<th>Gait analysis</th>
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*Any neurologic screen abnormality necessitates formal neurological or hospital assessment*

**Fig. 11.6** SCAT card.
Cervical Spine Injury

- Uncommon injury in soccer
- Results from extreme bending of neck with or without compression
- Devastating injury – can be life threatening
Cervical Spine Injury

Simple, prudent action can prevent permanent disability
Cervical Spine Injury
Cervical Spine Injury
Cervical Spine Injury

- On Field Mx – every downed player should be treated as having a cervical spine injury until proven otherwise.

- Head and neck stabilisation techniques should be employed if a player is unconscious or suspected of having a neck injury (e.g. midline neck pain).

- N.B – do not move the player until it is determined that the player does not have a C-spine injury.
Neck Immobilisation Techniques

- **First assess ABCs** – these are the immediate priority

- **Lateral Head Hold**
  - With the assistant in the kneeling position, straddling the athlete’s head, the assistant’s hands are placed on the lateral sides of the head, holding firmly
Neck Immobilisation Techniques

Rest your elbows on your thighs for greater stability
Hold the player's head straight to steady the neck, but do not completely cover their ears.

Rest arms on legs to keep them steady.

Holding the head.

How to measure the length of a player's neck.
Definitive Immobilisation

Fig. 7.5 The hard collar in place.

Fig. 7.6 Player's head and neck secure with sandbags and tape.

A player who is badly injured will need to be moved off the field on a stretcher.
- Ensure they have no neck or back injuries.
- Get the player to lie on their back.
- Help them to roll on to their good side.
- Support the injured limb if necessary.

B. Place the stretcher underneath the raised half of their body.

C. Gently lower the player down and move them into the middle of the stretcher.

D. Five assistants are required for a proper stretcher lift - one assistant at each side of the hips and shoulders and one assistant at the head.
- When lifting, the leader should begin a countdown to assure that the stretcher is lifted safely and evenly by all assistants.
- 1, 2, 3, and LIFT!

Fig. 7.10 Transferring a player by stretcher.
Cervical Spine Injury

- When ABCs are okay and head is immobilised – **call an ambulance**
- Inform ambulance control that player may have a spinal injury

- Above all
  - Keep player’s airway open – remove any blood / teeth
  - **Do not move player’s neck**

- Player must be transferred ASAP to hospital under controlled circumstances
  - Full spinal immobilisation
Surgery for Cervical Spine Injury
Fractured Clavicle (Collar Bone)

- Caused by blow to shoulder or a fall on the outstretched hand

- Most commonly broken bone in body!!

![Image of a clavicle with a red arrow pointing to it.](image_url)
Fractured Clavicle (Collar Bone)
Fractured Clavicle (Collar Bone)

- **On-Field Mx** – broad arm sling, pain relief

![Classic Triangle Sling Diagram]
Fractured Clavicle (Collar Bone)

- **Definitive Mx** – sling / figure-of-eight strapping
  - Fracture healing may take 8 – 12 weeks
  - Avoid contact sport for a further 1 -2 months
  - If fracture does not heal - surgery
Dislocated Shoulder

- **Two types**
  - **Anterior** (forward) - most common (96%)
  - **Posterior** (backward)
Normal Shoulder Anatomy
Dislocated Shoulder

- Player may have fallen onto his outstretched hand or received a direct blow to shoulder

- Player will complain of
  - Limited shoulder motion
  - Pain with movement of arm

- Player may have a history of shoulder dislocation
Dislocated Shoulder
Dislocated Shoulder

- **On- Field Mx** – Reduce the dislocation
  - may be done on the sideline without sedation before muscle spasm sets in
- **Traction** – countertraction reduction technique
Dislocated Shoulder

- **Acute, first-time dislocations**
  - Treat with sling immobilisation, Ice for 20 min x 4/day
  - If < 20 yrs – high recurrence rate; immobilise 4-6 weeks
  - If 20 - 40 yrs – immobilise 2 – 3 weeks
  - If > 40 yrs – low risk recurrence; immobilise 1 week

- **Return to play**
  - Full return of strength
  - Pain-free motion

- **If recurrent dislocations** – consider surgery
Wrist Fracture

Caused by a fall on the outstretched hand
Wrist Fracture

Player will complain of
- Acute pain
- Swelling of wrist
- Tenderness

Usually there will be obvious deformity of wrist
- “dinner-fork deformity”
Wrist Fracture
Wrist Fracture

- **On-Field Mx** – Immobilise in splint for pain relief
  - Transfer player to A & E

- Check for pins and needles in hand
  - **If pins and needles present** – transfer immediately to A & E
Surgery for Wrist Fracture
Finger Fracture / Dislocation

- Very common, especially goalkeepers!!

- Some injuries allow for continued participation in match provided adequate protective measures are taken!!
Finger Fracture / Dislocation

- “Mallet finger” – caused by the ball hitting the fully extended finger
- Player will complain of –
  - Painful, swollen finger
  - Unable to fully extend finger
Finger Fracture / Dislocation

- **On-Field Mx** – Splint for pain relief “buddy strap”
  - Transfer to A&E for X-Ray
Finger Fracture / Dislocation

- **Definitive Mx** – splinting in neutral for 6 – 8 weeks
Knee Ligament Injury

- Very common in soccer players

- Caused by a direct blow to the knee or as a result of a twisting injury
Knee Ligament Injury

Many ligaments in the knee

- **Cruciate** – Anterior (ACL) and Posterior (PCL)
- **Collateral** – Medial (MCL) and Lateral (LCL)
Knee Ligament Injury

ACL (Anterior Cruciate Ligament)
- Injured by either hyperextension of knee or blow from side of knee
- Can also be injured by pivoting on a planted foot / twisting (often a non-contact injury)

Player will often hear or feel a “pop”

Swelling occurs within 2 – 3 hrs

Player will be unable to continue
Knee Ligament Injury

- **PCL (Posterior Cruciate Ligament)**
  - Usually injured by a direct blow to front of knee
  - Swelling within 2 – 3 hrs, but less than ACL

- **MCL (Medial Collateral Ligament)**
  - Injured by blow to the outside of knee
  - Knee felt to bend inward with a tearing sensation / “pop”
  - Minimal swelling

- **LCL (Lateral Collateral Ligament)**
  - Injured by blow to the inside of knee
  - Usually seen in combination with ACL or PCL injuries
Knee Ligament Injury

**On-Field Mx**
- Ace wrap and immobilise for comfort
- Apply ice
- Start NSAIDs (e.g. Difene)
- Crutches needed

**Definitive Mx**
- MRI
- If mild / moderate injury - Functional brace
- More severe injury – surgery (ligament reconstruction)

**Return to Play**
- Depends on severity of injury
- Ranges from 4 weeks to 12 months
Knee Dislocation

- Severe injury
- Can occur in any direction
- Large amount of soft tissue injury
  - Usually requires injury of three ligaments to occur
- Player will complain of
  - Often more than one “pop” felt
  - Swelling within 2 – 3 hrs
Knee Dislocation
Knee Dislocation

- **On-Field Mx**
  - Check pulse in foot regularly – risk of arterial injury
  - Transfer player to hospital ASAP

- **Definitive Mx**
  - Reduce dislocation with manual traction (may require GA)
  - MRI to assess extent of soft tissue injury
  - Surgery to reconstruct knee ligaments

- **Return to Play**
  - Depends on severity of injury
  - Up to 12 months (if ever!!)
Meniscal Injuries

- Commonly injured
- Twisting injury while weight bearing
- May be torn with minimal symptoms

Player will complain of

- Acute onset of knee pain
- Swelling, usually occurring 12 – 24 hrs after injury
- Pain with squatting
- Unable to fully extend knee
- Knee locks in flexed position
Meniscal Injuries

Meniscus tear
Meniscal Injuries

**On-Field Mx**
- Remove player from pitch
- Apply Ice
- Start NSAIDs (e.g. Difene)

**Definitive Mx**
- MRI
- Surgical intervention for symptomatic tears

**Return to Play**
- If surgically excised – 4 – 6 weeks
- If surgically repaired – 6 months
Fractured Tibia / Fibula (Leg)

- Fracture of bones of leg
- Common
- High energy impact
  - e.g. tackle

Two types of fracture

- Closed – no bleeding or break in the skin
- Open – any fracture with an associated break in the skin
Fractured Tibia / Fibula (Leg)
Open Tibial Shaft Fracture
Fractured Tibia / Fibula (Leg)

- Open fractures are **orthopaedic emergencies** and require irrigation and IV antibiotics ASAP

**On-Field Mx**

- Always assess ABCs and the cervical spine
- When in doubt – immobilise (joint above and below)
- Apply ice (reduces swelling / relieves pain)
- Apply splint (allows swelling – safer than cast)
- Monitor for symptoms and signs of **Compartment Syndrome**
- Transfer to A&E ASAP
Compartment Syndrome

- **Orthopaedic emergency**
- Increased pressure in leg due to fracture eventually cuts off blood supply to leg / foot!!
- Player will complain of
  - Excruciating pain – out of proportion to signs
  - Pain is made worse by passive stretching of leg
  - Leg will become extremely tense

- If you suspect compartment syndrome
  - **DO NOT** elevate leg – makes situation worse
  - Splint fractured leg
  - Transfer to hospital ASAP
Surgery for Fractured Tibia / Fibula (Leg)

- Intramedullary (IM) nail
  - Closed fractures
Surgery for Fractured Tibia / Fibula (Leg)

- **External fixator**
  - Open fractures

- If compartment syndrome present
  - Fasciotomy
  - Opens up leg (relieves pressure)
Fractured Tibia / Fibula (Leg)

Return to play

- Decisions are made based on
  - the stability of the fracture
  - the demands of the player
  - functional testing prior to participation “fitness test”
  - Can take up to 9 months
Ankle Fractures

- Type of ankle fracture depends on the foot position at time of injury and the direction of force exerted

- Injury can result from
  - Falling to one side (“going over on ankle”)
  - Twisting injuries
Ankle Fractures
Ankle Fractures

- Player will complain of
  - Tenderness, swelling and bruising over ankle
  - Deformity of affected ankle

- On-Field Mx
  - Assess ABCs
  - Stabilise fracture and minimise swelling
  - Apply compressive splint
  - Elevate and apply ice
  - Crutches
  - Transfer to A&E ASAP
Ankle Fractures

**Definitive Mx**
- X-rays of affected ankle
- Casting if stable fracture
- Surgery if unstable fracture

**Return to play**
- Stable, non-displaced fractures – cast for 4 – 6 weeks
- Unstable fractures (requiring surgery)
  - Reassess every 2 weeks with X-rays to monitor healing
- Every ankle fracture will require extensive rehabilitation prior to return to play
Fig. 18.16  (A) Twisting injury that leads to broken ankle. (B) Bruising and swelling associated with a broken ankle.
Ankle Ligament Injury (Sprain)

- There are three major ligament groups
  - Medial ligaments – broad-based deltoid complex
  - Lateral ligaments – three small ligaments
  - Syndesmotic ligaments – join tibia and fibula together

- Most ankle injuries occur when toes are pointing towards the ground (ankle is most unstable)
Ankle Ligament Injury (Sprain)
Ankle Ligament Injury (Sprain)

- **Inversion** - injury to lateral ligaments
- **Eversion** – injury to medial ligaments
Ankle Ligament Injury (Sprain)

Player will complain of
- Pain
- Swelling of ankle
- Bruising

On-Field Mx
- Rest, Ice, Compression and Elevation (RICE)
- Apply compression using ACE wrap
- Rigid compression splint allows earlier mobilisation and hence shorter recovery time
Ankle Ligament Injury (Sprain)

- **Return to play**
  - Player must undergo ankle rehabilitation programme
  - Return to play when there is adequate strength with a full pain free ROM
  - **Bracing** – support with tape for 6 months during play
Foot Fractures / Dislocations

“Turf Toe”

- Dislocation (± fracture) of big toe
- Caused by forced dorsiflexion of joint
e.g. player kicked ground / landed on big toe

Pain and swelling big toe

On-Field Mx

- RICE
- Tape the toe in plantarflexion
Foot Fractures / Dislocations

“Jones Fracture” / Avulsion Fracture
- Fracture of a small bone on the outside of the middle of the foot
- Caused by a pivot in the opposite direction of the planted foot

Pain, swelling, bruising, tenderness over area

On-Field Mx
- RICE
- Non-weight bearing cast
Not All Sports Injuries Are Orthopaedic!!!
Fig. 12.2 Treating a nosebleed.
Fig. 5.15 Press down vertically with your elbows locked. Press down 4–5 cm.

Fig. 5.16 The symbol denoting a defibrillator.
Fig. 8.1 Multiple abrasions and lacerations to the face following a fall on gravel. (Courtesy of Ms Eilis Fitzgerald.)

Fig. 8.2 Repair of lacerations with suturing, performed by a plastic surgeon. (Courtesy of Ms Eilis Fitzgerald.)
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During the game
Fig. 9.7  A twisted knee scenario that may indicate ligament injury.
**Sport Concussion Assessment Tool (SCAT Card)**

**The SCAT Card (Sport Concussion Assessment Tool) Medical Evaluation**

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**1. SIGNS**
- Was there loss of consciousness/unresponsiveness? Y/N
- Was there seizure or convulsive activity? Y/N
- Was there a balance problem/unsteadiness? Y/N

**2. MEMORY**
Modified Maddocks questions (check if athlete answers correctly)
- At what venue are we? Which half is it? Who scored last? Did we win our last game?
- What team did we play last?

**3. SYMPTOM SCORE**
Total number of positive symptoms (from reverse side of the card)

**4. COGNITIVE ASSESSMENT** (5 word recall)

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<th>Delayed</th>
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**Months in reverse order:**

**Digits backwards (check correct)**
- 5-2-8  3-9-1
- 6-2-9-4  4-3-7-1
- 8-3-2-7-9  1-4-9-3-6
- 7-3-9-14-2  5-1-9-4-6-8

**Ask delayed 5-word recall now:***

**5. NEUROLOGIC SCREENING**

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*Any neurologic screen abnormality necessitates formal neurological or hospital assessment*

Fig. 11.6 SCAT card.
What should I check for?

Speak to the player
- Reassure the player
- Ask the player what happened. Get details of injury
- ‘How did you land?’
- ‘Did you feel/hear a crack?’ (Broken bone)
- ‘Did you feel a snap or feel like you pulled a muscle?’
- ‘Where is the pain?’
- ‘Point to the sore area.’
- ‘Does the pain go anywhere or is it in the same place?’
- ‘Can you move your arm?’
- ‘Do you have pins and needles?’

Problem identification

A player in a lot of pain generally has a serious injury
- Most injuries of the arm are obvious enough
- A player will point to the area of soreness and complain of pulling a muscle or receiving a blow
- Asking how the injury happened will give clues as to what the injury is – for example, severe shoulder pain after direct impact

Observe
- Look at the arm in question and compare it to the other side
- Focus on where it is sore
- Does the arm look different? Is it funny looking? (Broken bone)
- Is the player holding their arm in a particular way?
- Is there any swelling of the arm? Look at the normal side
- Check for obvious bruising, grazes or bleeding

Rule out serious injury

Remember – pain in the arm can come from a neck injury.
- ‘Can you move your arm?’ (If not, this indicates a potential neck injury: see Ch. 13)
- Any pins and needles/numbness in the arms? (If yes, treat as a neck injury)
- Can you see bone sticking out through the skin? (Red Zone Injury)
- Can you see blood spurting out from a wound? (Red Zone Injury)

Touch for tenderness
- Feel the area that was injured
- Is it swollen? Is it very sore to touch? (Does the player wince?)

Where is the injury?

Remove the player safely from the field of play
- If a neck injury is suspected, the player should have spine and back stabilization prior to transfer
- Any other injuries to the arm – ask the player to walk off the field with support
- If there are other injuries to the legs, etc., a stretcher is advised

Emergency transfer to hospital
- Any neck or spine injuries – ambulance
- Broken bones/dislocated – quickest possible means

Avoid further injury
- Immobilization of the injured arm
- Ensure no neck injury or other injury
- Any player who cannot perform basic skills runs the risk of doing more damage and should not continue (Amber Zone Injury)

Treatment
- Immobilization techniques (Figs 14.2–14.7)
- Application of ice
- Application of compressive bandage, if necessary
- Administration of painkillers (trained personnel only)
Fig. 18.2 Broken right hip – leg is shortened on left and rolled outwards.

Fig. 18.11 Dislocated knee cap.
Water Emergencies

Fig. 19.1 Reach, Thrown, Row, Don't go.
Fig. 19.2 How to remove someone safely from the water. (A) Place the swimmer on to their back. Hold the chin and neck steady while getting an assistant to support the head. (B) You will need two further assistants to support the trunk and legs, keeping the back and spine straight. (C) If a spinal board is available, place the board under the swimmer while holding the head and back steady. The swimmer is strapped to the board and brought to shore.

Diver receiving oxygen therapy and medical assessment.
Mountains

Fig. 20.3 Above 8000 m even acclimatization is not enough. Supplemental oxygen with a special oxygen regulator is required, as seen here. The photo is of Dr Clare O’Leary on the summit of Mount Everest in 2005. Courtesy of patfalvey.com.
After the Game