

Emergency First Responder

Musculoskeletal, Head & Spinal Injuries



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Objectives

By the end of this session you should be able to:

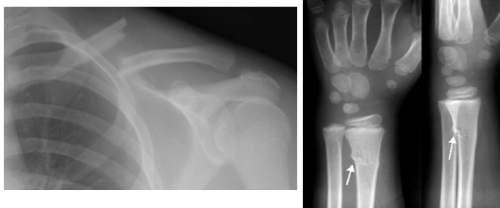
- Manage the patient with head, suspected spinal or major limb injuries



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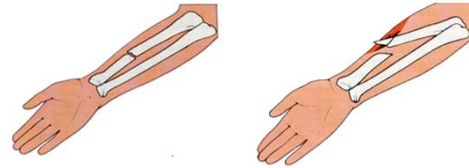
Fracture

A Fracture is a broken bone



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Types of Fractures



Closed

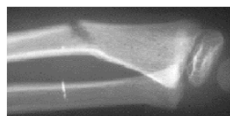
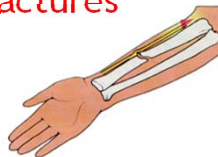
Open



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Types of Fractures

- Complicated
 - Associated injury to
 - Organs
 - Large blood vessels
 - Nerves
 - Joints
- Greenstick



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Causes of Fractures (MOI)

- Direct force
- Indirect force
- Twisting force



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Recognition of a Fracture

- Swelling, Slow capillary refill, Sound of the Break
- Pain
- Loss of movement, Loss of distal pulse
- Irregularity Deformity
- Numbness or tingling
- Tenderness
- Shock
- Bone visible
- Crepitus
- Discolouration



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Splinting

Splinting

- The process of immobilising an injury using a device such as piece of wood, cardboard or any suitable rigid object

Splint

- Any object that can restrict movement



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Why Splint?

Reduces

- Pain
- Damage to Soft tissue (reduces the possibility of a closed fracture becoming an open fracture)
- Bleeding



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Rules for Splinting

- Assess and reassure the patient
- Explain what you are about to do
- Splint the injury before movement and only move patient first if a life threat exists
- Expose injured part
- Control Major bleeding and dress open wounds
- Check distal CSM's before and after splinting



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Rules for Splinting



- Have everything ready before you commence
- Gently realign limb before splinting
- Apply gentle manual traction
- Immobilise above and below injured site
- Secure splints but leave fingers & toes exposed to monitor CSM
- Elevate limb if appropriate
- Provide oxygen and keep warm



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Traction

Gentle tension applied to a limb during the splinting process

Applied by pulling gently on a limb (manual traction)



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Applying Traction

- Straightens and stabilises a limb while a splint is being applied
- Traction must be maintained until splinting is completed
- May lead to a temporary increase in pain
- Apply steady tension along the long axis of the limb
- If there is resistance - Stop



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Management of a Closed Fracture

- Immobilise the fracture
 - At the scene if possible
 - Apply traction if necessary
 - Immobilise the joint above and below fracture site
 - Apply cold compress
- Treat for shock
- Ongoing assessment
- Check CSM before and after intervention



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Management of an Open Fracture

- Scene size up
- Initial assessment
 - Consider oxygen
- Further assessment
 - Focused examination
 - Circulation
 - Sensation
 - Movement



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Management of an Open Fracture

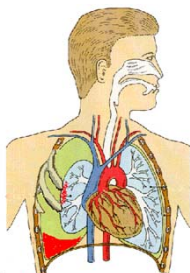
- Control bleeding
 - Dressing
 - Pad
 - Bandage
- Immobilise
- Further assessment
 - CSM



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Chest Injury Complications



- Injury to:
 - Lungs
 - Pneumothorax
 - Haemothorax
 - Heart
 - Major blood vessels
 - Liver
 - Spleen



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Chest Injury Complications

- Recognition
- Breathing
 - Difficult
 - Increased rate
 - Cough up blood
 - Hypoxia
 - Cyanosis
 - Reduced level of responsiveness
 - Internal bleeding
 - Shock
 - Pale
 - Pulse - rapid



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Chest Injury Complications

Management

- Scene size up
- Initial assessment
 - Keep a clear airway
 - Ventilate if necessary
 - Give oxygen
- Sit the casualty up if possible
 - Lean towards the injured side
- Elevation sling
- If Unconscious
 - Recovery position if possible



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Fractured Sternum

- Uncommon but serious
- Direct force or massive crush injury
- Suspect associated injuries
- Recognition
 - Severe pain
 - Abnormal movement
 - May present with crepitus over the injury (may occur during CPR in the elderly)



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Fractured Sternum Management

- Scene size up
 - Mechanism of injury
- Initial assessment
 - Maintain clear airway
 - Ventilate if necessary
 - Oxygen
- Sitting position if possible
- Arrange Early transport
- Further and ongoing assessment



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Fractured Ribs Recognition



- Pleuritic chest pain (pain on inspiration)
- Shallow breathing (due to pain)
- Rib tenderness



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Fractured Ribs Management

- Perform scene size up
 - Consider the mechanism of injury
- Perform initial assessment
- Sit up if possible
- Large arm sling
- Monitor vital signs
- Medical review

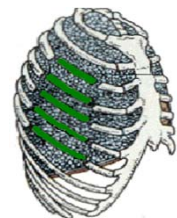


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Flail Chest

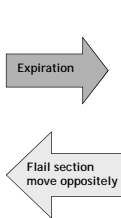
- Two fractures per rib
- At least three ribs involved
- May involve the sternum
- Indicates a significant mechanism of injury
 - Large force involved



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Flail Chest Recognition



- Breathing
 - Difficult
 - Increased rate
 - Blood stained sputum
- Paradoxical movement
- Crepitus
- Hypoxia
 - Reduce level of responsiveness
- Shock

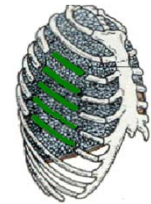


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Flail Chest Management

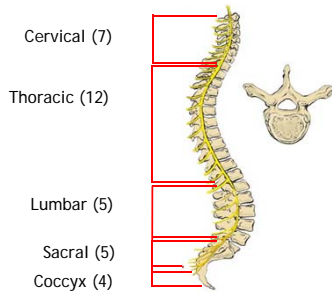
- Scene size up
 - Mechanism of injury
- Initial assessment
 - Clear airway
 - Cervical spine control
 - Oxygen
 - Ventilate if necessary
- Stabilise the flail segment
 - Thick pad and tape in place
- Full spinal immobilisation



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The Spinal Column



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Importance of Head Injuries

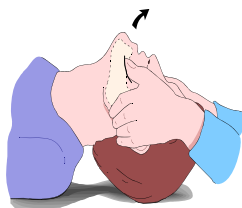
- Possibility of an underlying brain injury
- Airway management difficulties
- Strong association with cervical spine injury



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C.A.c.B.C



- Control catastrophic bleeding
- Airway
- cervical spine
- Breathing
- Circulation



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Types of Head Injury

- Scalp Wounds
- Fractured Skull
- Concussion
- Cerebral Compression
- Cerebral Contusion
- Facial injuries



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Signs & Symptoms of Head Injuries

- Decreased LOC
- Deep cuts & tears to the scalp
- Contusions or Haematoma to scalp
 - Battles sign & Raccoon eyes
- Blood/CSF from the nose and ears
- Exposed Brain tissue/Deformity of skull
- Penetrating injuries
- Edges or fragments of bone seen/felt



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Signs & Symptoms of Head Injuries

- Weakness or numbness on one side of the body - stroke due to bleed
- Deteriorating vital signs

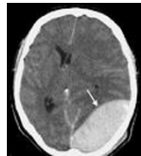


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Signs & Symptoms of Brain Injury

- Altered LOC
 - Confusion
- Headache
- Signs of head trauma
- Personality changes
- Paralysis
 - facial muscles
 - limbs
- Loss of function
- Loss of sensation
- Bilateral weakness or numbness
- Disturbed or impaired vision
- Nausea +/- Vomiting
- Seizures
- Changing patterns in respiration



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Signs & Symptoms of Facial Injury

- Blood in the airway mouth or nose
- Facial deformities
- Swelling / discolouration of eyelids
- Swelling discolouration of any part of the face
- Swollen lower jaw, poor function of inability to close the jaw
- Deformity to the face
- Broken teeth



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Facial Injury Management

- Scene size
- Initial assessment
 - Ensure a clear airway
 - Consider cervical spine
- Sit up if possible
- Control bleeding
- Apply a cold compress
- Retain loose teeth
- Medical advice



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Head Injury Management

- Scene size up
- Initial Assessment
 - Control catastrophic bleeding
 - Airway - Jaw thrust
 - Suction
 - Oropharyngeal airway
 - Breathing
 - Oxygen
 - Ventilate if necessary
 - Circulation
 - Disability
 - AVPU
 - Expose & Examine



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When to Suspect a Spinal Injury

- Mechanism of Injury
 - High index of suspicion
- Signs & Symptoms of a Vertebral Fracture
- Signs & Symptoms of a Spinal Cord Injury



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Spinal Injury Signs & Symptoms

Spinal Cord Injury

- Loss of power, movement or sensation
- Paralysis
- Burning sensation along spine or in an extremity
- Loss of bladder or bowel control
- Difficulty in breathing
- Priapism

Vertebral Fracture Injury

- Swelling
- Slow capillary refill
- Sound of the Break
- Pain
- Loss of movement
- Loss of distal pulse
- Irregularity Deformity
- Numbness or tingling
- Tenderness
- Shock



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Manual Stabilisation

Seated casualty



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Manual Stabilisation

Supine casualty with manual stabilisation



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Helmet Removal

- Requires **TWO** to remove
- **Avoid** moving c-spine when removing helmet
- Take immediate control of the helmet
- Have assistant open straps, remove glasses
- Assistant supports mandible and head
- Pull helmet side out and part slide off head
- Assistant slides hand up back of head to take weight when helmet is fully removed
- Finish removing helmet



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Applying a Stiffneck Collar

- Manual Stabilisation to ensure Neutral Alignment of spine
- Measure for Collar



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Applying a Stiffneck Collar

- Select and size collar
- Prepare collar
- Slide collar up under the chin



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Applying a Stiffneck Collar

- Secure collar
- Continue to maintain in-line manual stabilisation



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Log Roll

- Only under EMT/Paramedic/Advanced Paramedic supervision unless a life threat exists
- 4 people minimum required:
 - 1 at head, 1 at shoulder, 1 at waist and 1 at knees
- Person at head gives the commands



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Remember

Manual stabilisation is to be maintained until the patient has been immobilised on a long board and his head secured in an immobilisation unit!



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Summary

- Recognition and management of fractures
- Management of head and spinal injuries
 - Manual stabilisation
 - Helmet removal
 - Application of cervical collar



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