MAJOR TRAUMA TRIAGE PROTOCOL

Trauma Team Call

Bleep 6000 and ask for Adult / Paediatric / Obstetric Trauma Team if any of the following criteria are met.

Trauma team consists of senior ED doctor/consultant, surgical SHO and reg, anaesthetic SHO and reg +/- paediatric team +/- Obstetric team

<table>
<thead>
<tr>
<th>Physiology Factors</th>
<th>Anatomy Factors</th>
<th>Mechanism of Injury</th>
<th>Co-morbidity Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Systolic BP &lt; 90</td>
<td>• Penetrating injury</td>
<td>• Ejection from vehicle</td>
<td>• Pregnancy</td>
</tr>
<tr>
<td>• RR &lt; 10 or &gt; 29</td>
<td>• High energy blunt injury</td>
<td>• Fall &gt; 6m (20ft)</td>
<td>• Age &lt; 5 or &gt; 65</td>
</tr>
<tr>
<td>• GCS &lt; 13</td>
<td>• Flail chest</td>
<td>• Death of an occupant</td>
<td>• Anticoagulants</td>
</tr>
<tr>
<td>Paediatric:</td>
<td>• Associated burns</td>
<td>• Delayed extraction</td>
<td>• Bleeding disorder</td>
</tr>
<tr>
<td>• Respiratory distress</td>
<td>• ≥ 2 long bone #s</td>
<td>• Vehicle rollover</td>
<td>• IDDM</td>
</tr>
<tr>
<td>• Cap Refill &lt; 2</td>
<td>• Unstable pelvis</td>
<td>• High speed crash</td>
<td>• Immuno-compromised</td>
</tr>
<tr>
<td>• Tachy / Bradycardia</td>
<td>• Skull #</td>
<td>• Large animal injury</td>
<td></td>
</tr>
<tr>
<td>• Inappropriate behaviour</td>
<td>• Associated paralysis</td>
<td>• Pedestrian / cyclist thrown or run over</td>
<td></td>
</tr>
</tbody>
</table>

MAJOR TRAUMA – ADULTS (SEE ALSO TRIAGE, ‘ABC’, BURNS, HEAD INJURY, FRACTURES

This term refers to patients who have been injured and who are either very ill or who may become very ill later. The patients are identified using the triage protocol in Section One.

Assess patients using recognised ATLS principles.
MAJOR TRAUMA

AMPLE history
Allergies
Medications
Past medical history
Last meal
Events leading

Primary Survey

A: Ensure patent airway, airway adjunct or intubate if necessary
   Protect neck with ‘stiffneck’ collar, sandbags and tap on a trauma mattress

B: Assess breathing – check for chest wall trauma, auscultate, sats RR
   Apply 100% oxygen
   Ventilate if inadequate respiration

C: Assess circulation and cardiovascular status
   Haemorrhage control
   2 large bore IV access – send bloods for FBC / U+E / Cross match
   Fluid resuscitation with 0.9% normal saline +/- O neg blood – permissive hypotension
   Pelvic binder if potentially unstable fracture
   Consider Tranexamic Acid 1gram within 3 hours of injury if potential for critical bleeding

D: Mini-neurological assessment to include AVPU / GCS, pupils, posture, log roll
   (include PR exam if any spinal tenderness)

E: Expose patient to identify obvious injuries, cover up to prevent heat loss

- Request imaging as indicated:
  o CT head and C-spine
  o CT chest / abdo / pelvis
  o Trauma series x-rays if no indication for CT – c-spine / chest / pelvis
- Analgesia as required eg. aliquots of morphine 5-10 mg IV +/- antiemetic

Secondary Survey

Keep re-assessing ‘ABC’

Do a secondary survey: Head
__________________________ Chest
__________________________ Abdomen
__________________________ Pelvis
__________________________ Limbs
__________________________ Reflexes

Do not delay unstable patients with uncontrolled haemorrhage from going to theatre
for definitive or damage control surgical treatment
The patient deteriorates as the inflammation progresses

**Discuss with Burns Unit if:**

- Potential airway burns (signs of smoke inhalation at nose or mouth)
- >20% BSA involved (>15% in children)
- Burns in difficult areas (hand, perineum)
- Circumferential, deep or full thickness burns (check sensation & appearance)

- Apply water gel (beware hypothermia) and give 100% oxygen
- Give iv Morphine at once – large doses often required. In severe burns a morphine infusion may be required
- ABC – remember that burned patients have often sustained other injuries. Shock in first few hours is not due to burns
- You must ask for an early anaesthetic assessment if any suspicion of airway burns - they will get worse.
- Think of inhaled poisoning – CO or cyanide*. Measure COHb if consciousness is in any way impaired. If elevated COHb discuss hyperbaric oxygen with Craigavon Hospital
- Have another look at burns - superficial or deep? Estimate % BSA using Lund and Browder Chart (below)
- Give if >20% BSA give iv fluids to prevent the onset of burns shock –

**Volume in mls = wt(kg) x %BSA x ½ in first four hours from time of burn**

- TREAT ALL VICTIMS OF FIRE IN UNEXPLAINED CARDIAC ARREST FOR CYANIDE POISONING --- THERE IS A CYANIDE TREATMENT PACK IN RESUS.
### Lund and Browder Chart

<table>
<thead>
<tr>
<th></th>
<th>&lt;1</th>
<th>1</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = ½ head (%)</td>
<td>9.5</td>
<td>8.5</td>
<td>6.5</td>
<td>5.5</td>
<td>4.25</td>
<td>3.5</td>
</tr>
<tr>
<td>B = ½ thigh (%)</td>
<td>2.75</td>
<td>3.25</td>
<td>4</td>
<td>4.25</td>
<td>4.5</td>
<td>4.75</td>
</tr>
<tr>
<td>C = ½ leg (%)</td>
<td>2.5</td>
<td>2.5</td>
<td>2.75</td>
<td>3</td>
<td>3.25</td>
<td>3.5</td>
</tr>
</tbody>
</table>

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**Classification of burn depth**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Degree (superficial, partial)</td>
<td>Limited to epithelial layer of the skin.</td>
</tr>
<tr>
<td></td>
<td>Very painful and erythematous.</td>
</tr>
<tr>
<td></td>
<td>Excluded from estimates of % burns</td>
</tr>
<tr>
<td></td>
<td>Heals well</td>
</tr>
<tr>
<td>Second Degree (deep, partial)</td>
<td>Extends to dermis</td>
</tr>
<tr>
<td></td>
<td>Painful</td>
</tr>
<tr>
<td></td>
<td>Heals more slowly</td>
</tr>
<tr>
<td>Third Degree (full thickness)</td>
<td>Analgesic</td>
</tr>
<tr>
<td></td>
<td>Full-thickness burn tissue is unable to stretch in response to underlying oedema, and circumferential full-thickness burns thereby exert a tourniquet effect that may compromise tissue perfusion and require urgent release or 'escharotomy'.</td>
</tr>
</tbody>
</table>
INJURY AND MUSCULOSKELETAL

HEAD INJURY (SEE ALSO MAJOR TRAUMA)

This is a high-risk injury!

Follow the 2014 NICE guidelines given on the next two pages to help you manage head injuries.

As well as acutely injured patients, you will often see patients attending “minors” a few days after the event complaining of persistent headache etc.

Late-presenting head injury symptoms and patients on Warfarin have a strong association with CT abnormality – discuss with a senior doctor.

Safe discharge and Admission

Do not send home patients with head injury if GCS less than 15
Do not send home patients with head injury if no one at home
Patients can be admitted to the Observation ward if GSC15 or have a normal CT (performed as per the guidelines) and GCG 14 or 15
Patients should be admitted under the surgical team if GCS 13 or less, abnormal CT, polytrauma patient or no Observation beds available.

Written and verbal discharge advice should be given to all patients / relatives. These are found on Symphony.

Referral to Neurosurgical Team

All patients with abnormalities on CT Head scan should be referred to the neurosurgical reg in RVH #6124. Remember to document in the notes the times and name(s) of the doctor(s) you discussed the case with. Clearly document any advice given, especially if the patient is likely to be admitted under another team.
If patients are anticoagulated (warfarin, NOAC) with a significant head injury, reversal should be given immediately and an urgent CT performed as above. NICE recommends CT head imaging within 8 hours for patients with head injury on anticoagulant and without indicators for urgent CT scan but regionally it has been recommended that these scans are performed within 1 hour and urgent consideration is given to reversal of the warfarin (or NOAC).
Algorithm 3: Selection of adults for imaging of the cervical spine

Adults presenting to the emergency department who have sustained a head injury.

Are any of the following risk factors present?

- GCS < 13 on initial assessment
- Intubation
- A definitive diagnosis of cervical spine injury is required urgently (e.g., before surgery)
- Other body areas are being scanned for head injury or multi-region trauma
- The patient is alert and stable, there is a suspicion of cervical spine injury and any of the following are present: age > 65; dangerous mechanism of injury (fall from > 1 metre or 3 stairs, axial load to head, high-speed motor vehicle collision, rollover motor accident, ejection from a motor vehicle, accident involving motorized recreational vehicles, bicycle collision), focal peripheral neurological deficit or paresthesia in the upper or lower limbs.

Yes

Perform CT cervical spine within 1 hour of risk factor being identified.

No

Is there suspicion of cervical spine injury (neck pain or tenderness) with any of the following low risk factors present, which indicate it is safe to assess the range of movement of the neck?

- Involved in a simple rear-end motor vehicle collision
- Is comfortable in a sitting position in the emergency department
- Has been ambulatory at any time since injury
- Absence of midline cervical tenderness
- Presents with delayed onset of neck pain

No

Perform three-view cervical spine X-rays within 1 hour of risk factor being identified.

Yes

Can assessment can the patient actively rotate the neck to 45 degrees to the left and right?

No

Are the three-view cervical spine X-rays technically adequate, suspicious or definitely abnormal?

Yes

No imaging/further imaging required

No
Injury and musculoskeletal

Concussion is a common injury, especially in young people playing sports. Significant harm can be caused by a second head injury in a patient with concussion. This is taken very seriously in professional sports such as rugby but non-professionals are at risk too. The following is taken from the Observation Ward discharge advice for return to sport and should be explained to the patient should be followed.

- Prior to fully returning to sport/strenuous activity, it is important that you follow the ‘step-wise’ system overleaf to allow you to return safely.
- It is likely that you may experience a number of symptoms as a result of your head injury (listed below). These are different to the immediate return indications listed on the Head Injury Advice Sheet.
- It is vital that your symptoms have completely cleared at each level for a minimum of 24 hours before you progress to the next level.
- You should not return to any full sporting activity in less than 1 week.
- Where any unconsciousness or significant loss of memory after the injury (post traumatic amnesia) has occurred there should be no full contact activity (Level 5) within 3 weeks. In these circumstances a medical review by your GP or your professional medical advisor should be undertaken before any full contact activity.

Possible Symptoms after a head injury

- Mild headache
- Tiredness
- Dizziness
- Sleep disturbance
- Poor concentration
- Irritability
- Memory problems

If symptoms develop at any exercise level then you should return to Level One (i.e. 24 hours rest).

Contact your GP if your symptoms are persistent and/or not improving.

On discharge

Second Impact Syndrome

Second Impact Syndrome is a rare condition which occurs when a person with symptoms related to their recent head injury (concussion) suffers a second head injury. Second impact syndrome may occur days or weeks after the initial concussion. This second injury may be relatively minor but it can lead to collapse and death. For this reason we do not recommend full contact in sports for at least three weeks and only after medical advice. It is also important to inform your doctor of your initial head injury.
## INJURY AND MUSCULOSKELETAL

<table>
<thead>
<tr>
<th>LEVEL 1</th>
<th>No physical activity / complete rest</th>
</tr>
</thead>
</table>
| LEVEL 2 | Low levels of physical activity i.e. symptoms do not come back during or after the activity.  
  e.g. walking, light jogging, light stationary biking, light weightlifting (lower weight, higher reps, no bench, no squat). |
| LEVEL 3 | Sport specific training or Moderate levels of physical activity with body/head movement  
  e.g. running in football, moderate jogging, brief running, moderate-intensity stationary biking, moderate-intensity weightlifting (reduced time and/or reduced weight from your typical routine). |
| LEVEL 4 | Heavy non-contact physical activity / training drills  
  e.g. sprinting/running, high-intensity stationary biking, regular weightlifting, routine non-contact sport-specific drills |
| LEVEL 5 | Full contact in controlled training/practice. |
| LEVEL 6 | Full contact in games/ Return to competition. |

doi:10.1136/bjsports-2013-092313

## FRACTURES (SEE ANKLE AND FOOT, SHOULDER AND CLAVICLE, KNEE, NECK, WRIST, SEDATION, FALLS AND HAND INJURIES)

This handbook cannot give an exhaustive account of fracture management, however guidelines about the management of common fractures can be found later in this section. As well as this, McRae provides easy-to-follow guidelines in the department’s copy of “Practical Management of Fractures”. Consult these first but ask for advice if in doubt.

Here is some general information about fracture management:
Our Specialist Fracture Service is provided by RVH Fracture Clinic; RBHSC
Children’s Fracture Clinic

Adult Fractures

- Patients who may require urgent operative treatment should be referred to
  the fracture clinic immediately; this includes all compound fractures (except
  finger tip injuries. These can be managed in the Emergency Department)
- Fractures that are badly displaced/angulated, intra-articular or comminuted
  should be discussed with RVH (excluding elderly patients with Colles
  fractures)
- All ankle fractures that are bi-malleolar, medial malleolar or associated with
  talar shift should be discussed with RVH
- Acute tense haemarthrosis should be discussed with the fracture clinic.
  Fractures around the tibial plateau(condyles) are easily missed – be
  vigilant; all should be referred
- All fractured neck of femurs should be referred to RVH for admission.
- All consults with the RVH should be recorded on the Emergency
  Department notes and fracture doctor’s name recorded
- NSAIDs may inhibit fracture healing and should NOT be prescribed.
- All patients over 18 with lower limb fractures should undergo VTE
  assessment. There is a specific form for this assessment in Antrim and
  should be followed until the regional assessment form becomes available
  later this year.
- For all patients diagnosed with a fracture not requiring urgent intervention,
  tell patients that we have requested # clinic follow up but that the date will
  be dependant on the triage system in Whiteabbey Hospital.

Looking after Children’s Fractures

- Children’s fractures are hard to see - when in doubt plaster!
- When children fall onto their outstretched hand while roller-blading, biking
  etc, they usually sustain a greenstick fracture distal radius at least. Use a
  Futuro Splint if you can’t see a fracture. Check elbow!
- Refer torus (buckle fracture no displacement) fractures to the Fracture
  clinic.
- Children under three can remove short arm pops - use long arm pop with
  this age group. If slightly older children return with short arm plaster
  problems then place in a long arm pop.
- If you discharge a child with a diagnosis of soft tissue injury, tell parents to
  return the next day if their child still has significant pain - soft tissue injuries
  in children clear up very quickly.
- Significant displacement or angulation and all compound fractures should
  be discussed with RBHSC
**Liaison with Plastic Surgery (UHD)**

Hand fractures that may require internal fixation are usually referred to Plastic Surgery. These include all unstable/rotated finger fractures. Assume this if oblique or spiral on x-ray, displaced on x-ray, malrotation or deformity clinically or complete inability to flex. Fractures involving more than one third of IPJ surface should be referred. Fractures of distal phalanx are managed at the Review Clinic.

**Older patients**
- Elderly patients with fractures often require a care package via the social worker because of a short term increase in dependency (e.g. reduced mobility due to # vertebrae, pubic rami or loss of independence due to an upper limb fracture). Hospital admission shouldn’t be required for nursing needs alone.
- Always look out for unexplained or recurrent falls – more about this under “Falls” in clinical section.

**Query fractures, small avulsion fractures**
- If you aren’t sure about these, treat with sling, backslab, non weight-bearing etc. Explain that there may be a “minor injury to the bone” but that the diagnosis will not be certain until a second x-ray is taken after ten days. Refer to the Emergency Department Review Clinic for this.
- Don’t put a leg in plaster if the patient is over 45 or has other risk factors for DVT unless there is a definite fracture. Use strapping and crutches.
- The management of clinical scaphoid fractures is important (see wrist injuries).
- Look out for the ‘fat pad sign’ in the elbow as a pointer to radial head # (this is the most commonly missed fracture). Treat with collar + cuff and x-ray at ARC day 7-10. A clinically fractured elbow will not have a normal range of movement. Treat if in doubt.

**Reductions in the Emergency Department**
- Only uncomplicated wrist fractures (such as Colles Fractures) should be reduced in the Emergency Department
- Analgesia / sedation options include:
  - Entonox/ Penthrox
  - Haematoma block
  - Conscious sedation (assess suitability using sedation proforma, also use this to facilitate safe sedation practice – MUST have senior ED doctor signed off to perform sedation and separate procedure doctor)
- A post-reduction plaster should be A SPLIT FULL CAST (never unsplit POP).
INJURY AND MUSCULOSKELETAL

- POP advice must be given - all patients re-attending with symptoms suggesting a tight plaster should have their cast opened immediately after triage.
- Need fracture clinic appointment within 1 week
- Failed reductions should be discussed with RVH
- Fracture reductions may be deferred until next day if no neurovascular compromise is found. Admit these patients to the Obs ward overnight for analgesia and fast from 6am.
- Reduction of dislocations must be performed in a timely fashion.

SOFT TISSUE INJURIES (SEE ALSO FRACTURES, NECK, ANKLE AND FOOT, SHOULDER AND CLAVICLE, KNEE, LOW BACK PAIN)

It is often minor injuries that present doctors new to the Emergency Department with the most difficulty. Soft tissue injuries are satisfying to treat – they often happen to active, healthy people, especially sportsmen and women who are highly motivated to recover.

- (dolor, rubor, tumour, calor) so the injury will look and feel progressively worse over the next 2-5 days. This process responds to rest – ice (15mins with frozen peas qid!)-compression bandage – elevation and non-steroidal drugs help also.
- Regain NORMAL MOVEMENT. After the inflammatory phase, gradual return to normal movement is encouraged. Patients must return to normal activities as soon as possible or stiffness and wasting will deteriorate. Often this is just a matter of common sense but for more complicated injuries, physiotherapy may help. This phase may take several weeks.
- Return to SPORT. Sports people or manual labourers will need further rehabilitation to regain the muscle strength and proprioception that they will have lost during phases one and two of recovery. Failure to follow a rehabilitation programme at this stage will cause injury.
- Physios (either hospital or club) can supervise this. There is also information on the internet about self help for various sports and injuries.

Here are a few commonly encountered soft tissue injuries - all of them are suitable for referral to physiotherapy, especially if severe:

A “contusion” is a bruising injury to soft tissue generally caused by a direct blow (e.g. multiple contusions after an RTA). More extensive bleeding leads
to a haematoma that may be localised, leading to a fluctuant swelling or diffuse, leading to an area of woody-hard muscular induration.

A "sprain" is a ligament injury, e.g. ankle sprain, acute neck sprain. The commonest sprains involve the lateral ligaments of the ankle and the medial collateral ligament of the knee.

Ligament Injuries are often classified according to severity
Grade One: Pain on stressing but no laxity (no significant tear)
Grade Two: Laxity with an end-point (partial tear)
Grade Three: Laxity with no end point (complete tear)

A "strain" is a muscle tear, either intrinsic e.g. an acute lumbar strain may be "intrinsic" (sudden stooping) or "extrinsic" (falling from a height). This can result in diffuse or discrete bleeding, loss of power or function, a palpable gap and spasm/pain.

Explain the natural history of soft tissue injury (above) and advise that symptoms may last for months although they should not get worse. Patients should return immediately if worse or after ten days if not improving at all – this suggests a missed fracture etc. The appropriate advice sheet should be given (a selection of these are available).

NECK (SEE ALSO SOFT TISSUE INJURIES, FRACTURES)

Pain without injury:
• Usually muscular (Wry Neck)
  NSAID, massage, heat, very urgent physiotherapy
  Consider ENT cause in kids
• Occasionally caused by Cervical disc prolapse
  Severe pain with nerve root pain +/- signs
  If neurology, discuss with on-call orthopaedics

Suspected Neck Injury
• Patients who may have thoracic or lumbar injury should lie flat on a trolley (never a long board - this is for transport & lifting only)
• Cx spine x-ray unless no mechanism for spinal injury, full range of movement and no tenderness
• Acute Neck Sprain – tends to get worse over a few days - NSAID, mobilise, reassure
• Spinal Fractures-Patients who may have cervical spine injury should lie flat on a trolley with neck
immobilised in cervical collar, sandbags and tape until x-ray and examination exclude this. The first (lateral) x-ray will require traction on the arms so that C7/T1 can be seen. Do not accept non-diagnostic x-rays – seek senior advice.

- When x-rays discuss spinal injury, seek advice

**Cervical spine x-rays**
Cervical spine x-rays do not need to be ordered if all the following are met (NEXUS criteria):
- No posterior midline tenderness
- No evidence of intoxication
- Normal level of consciousness
- No focal neurological deficit
- No painful distracting injuries.

All other patients with neck injuries require spinal immobilisation and x-rays.

---

**Penetrating Neck Wounds**
- All penetrating wounds require exploration in theatre
- Never probe, cover – Air embolism!!
FACIAL INJURIES

The airway is a risk with major facial injuries – request anaesthetic assessment!

Malar Fractures
- Blow to the cheek
- Tender, limited upgaze, numbness.
- Facial X-rays will confirm diagnosis (sinus is cloudy compared to other side)

Maxillary fractures
- Usually high energy impact
- Facial swelling
- Malocclusion
- Epistaxis
- Facial X-rays should be taken but may not help
- Facial bone instability may be found on examination

Mandibular Fractures
- Assault or RTA
- Malocclusion
- Pain on clenching teeth
- OPG shows fracture (often bilateral) if you look carefully

Blow-out fracture
- Blow to eyeball
- Limited upgaze +/- diplopia
- Soft tissue (teardrop) visible on Facial x-ray
ABCs of the Facial X-ray

A: Adequacy
   Alignment - Check lines 1-5 (see above)

B: Bones

C: Cartilage and joints
   Zygomaticofrontal suture

S: Sinuses - Opacification and air-fluid levels
   Soft tissue - Swelling and Foreign bodies
Le Forts Fractures of the Face

All definite or suspected facial bone injuries should be discussed with the maxfax SHO in the Ulster hospital urgently (NOT the patient’s own dentist)
INJURY AND MUSCULOSKELETAL

DENTAL EMERGENCIES (SEE ALSO FACIAL INJURY)

There is a very limited emergency dental service for patients. The details of this are kept in the Triage cubicle. Dentists are supposed to provide emergency cover for their patients but some of their answer-phones advise patients to attend Antrim Emergency Department! You must be able to provide basic emergency care. Advise patients with a non-traumatic dental problem to contact their own dentist to arrange follow-up.

Dental pain
Give strong analgesia. Clove oil may be of benefit. Patients are advised to attend their dentist.

Out of hours relief of dental pain clinic phone 25663500. There is also a clinic in BCH.

Dental Infection
Give strong analgesia and antibiotics (check BNF)
NB LUDWIG’S ANGINA, AN INFECTION CAUSING SWELLING OF THE FLOOR OF THE MOUTH AND POTENTIAL SUDDEN-ONSET UPPER AIRWAY OBSTRUCTION – ADMIT – CONTACT ENT!

Dental Haemorrhage
Patient should bite on a roll of gauze
Consider coagulopathy
Follow BNF guidelines for bleeding in warfarinised patients where relevant
Seek advice from Maxfax SHO in the Ulster Hospital

Trauma
Dental trauma can be referred to RBHSC (under thirteens) or UHD (any).
Avulsed second teeth should be replaced in Triage prior to seeking dental advice. If this is impossible, keep tooth in N Saline.

SHOULDER AND CLAVICLE

Non-Traumatic Shoulder pain
Septic arthritis must be excluded in all atraumatic joint pain – temp + ESR.
“Frozen shoulder” is caused by a variety of pathologies all characterised by pain (especially at night) and restriction of movement at the shoulder joint. The two commonest causes are (a) Capsulitis, involving the rotator cuff muscles, characterised by equal restriction of abduction, internal & external rotation and (b) Supraspinatus tendonitis with pain on restricted abduction only.
Use collar & cuff + NSAD and physio referral. Evidence for injection now inconclusive. Shoulder pain may be referred from the neck – examine as well.

**Injury around the Shoulder**

**Dislocated Shoulder**
Commonly anterior but can be posterior (x-ray looks fairly normal but light-bulb shaped humerus and clinical suspicion). Can occur as the result of seizure/collapse. Always ask for a glenoid view. Normal glenoid view is below.

Shoulder may be reduced under self-administered $\text{N}_2\text{O}$ from entonox bottle OR iv sedation (not both!). Consent must be obtained. Sedation must be performed in resus by senior doctor with airway and sedation competencies. Aftercare – inside-clothes collar & cuff or polysling and FC review.

Clavicle Fracture
Inside-clothes sling or C+C, analgesia and fracture clinic 7-10 days.
Tell patient that they will have a permanent bump on their shoulder but that these are rarely troublesome.
Don't panic about marked deformity unless a spike of bone is tenting skin or there is a neurovascular problem (discuss the latter with RVHFC)
Colles Fracture
Did you remember that Abraham Colles described dorsal angulation, impaction and rotation of the distal radius + ulnar styloid avulsion? Strictly speaking all distal radial fractures are not Colles Fractures!

Emergency Department treatment is only suitable for low-impact fractures without comminution or joint involvement – other distal radial fractures should be discussed with RVH FC. >15\(^\circ\) angulation and/or impaction of the distal radius usually requires reduction. You will be taught how to assess, reduce and discharge patients with this injury – do not undertake this procedure unsupervised unless a consultant has told you that you are competent to do this procedure unsupervised.

Haematoma Block
This procedure can be used to manipulate closed Colles-type fractures in patients aged 45+.
This procedure should not be performed by a solitary doctor; a qualified nurse or plaster technician must be present and a second doctor rapidly available.

Method
1. The fracture must be a less than 24 hours old, no signs of infection.
2. Patient should be monitored (in case of inadvertent IV injection of lignocaine).
3. Prepare the patient, explain the procedure, obtain consent. <1\% (1 in 1000) chance of osteomyelitis.
4. The forearm should be prepped with iodine. The operator must wear surgeon’s sterile gloves.
5. Prepare 10ml 2\% lignocaine in a 10ml syringe and green (21G) needle.
6. The anaesthetic should be injected directly into the fracture haematoma: Locate the fracture site by palpation. You should feel the needle coming into contact with the jagged bone ends as it passes between them to a depth of 3-4cm. Aspirate some of the haematoma from the fracture site (but be aware that it is not possible to be certain that you are not in a vein rather than the haematoma!).
7. Inject VERY SLOWLY to minimise the risk of complication. The wrist will become tight. Put a sterile dressing (eg mepore) over puncture site(s)
8. Wait for block to take effect - on average 5-10 minutes. Check analgesia before proceeding to manipulate. Supplement with “Entonox” if necessary but if patient complains of persistent pain, get senior help; do not proceed with manipulation.
9. The patient can be mobilised after their check x-ray if they feel ready to get up.
INJURY AND MUSCULOSKELETAL

Smith’s Fracture
“Upside-down Colles”. If you don’t view all your lateral wrist x-rays thumb-down you will miss this! Discuss with RVHFC – should be immobilised in split LAPOP post reduction but this should only be undertaken by experienced doctors.

Scaphoid Injury
Clinical: All painful wrists following trauma with any scaphoid signs must have wrist and 'scaphoid views’. You must always examine for scaphoid injury in all the following ways:
- ASB tenderness or swelling
- Pain on telescoping and impinging thumb vs 1st MC
- Pain on flexion + ulnar deviation
- Pain over palmar scaphoid

Management: 1. Clinical Scaphoid (ie signs but no x-ray changes).
   - If there is strong suspicion (more than 1 sign) – SAPOP and bring back to nurse practitioner day 14.
   - If there is mild-moderate suspicion (1 sign) – Thumb-o-prene splint and bring back to nurse practitioner day 14.
2. Radiological scaphoid fracture.
   - If you see a fracture SAPOP and FC – they are usually six-eight weeks in plaster.

Other Fractures
- Undisplaced wrist fractures and greensticks = POP, sling and FC
- Other wrist fractures should be discussed with RVHFC.

HAND INJURIES AND INFECTIONS (SEE ALSO FRACTURES)

All hands should be examined for tendon function, sensation (pin-prick) and joint swelling. Record occupation and dominant hand. Uniquely, hand injuries should be x-rayed even if fracture unlikely - if only one finger involved ask for finger XR rather than hand. Most significant hand injuries benefit from elevation in a volar slab and high sling for a few days (i.e. until the next Review Clinic).

Flexor tendon injuries, significant amputation or degloving, nerve damage, high-pressure injection injuries and suppurative tenosynovitis or multiple hand fractures should be referred to the Plastics Registrar (Ring UHD).
Mallet Finger
Where the ability to extend the distal phalanx is lost. X-ray and if there is a fracture involving more than one third of the joint surface refer to Plastics. Otherwise treat with a well-fitting “mallet splint” and next ARC appointment. The patient must not remove the splint. Six weeks’ treatment is usually required.

Finger Sprains and volar plate injuries
These generally affect PIP joints - any swelling here, treat as sprain. If hyper-extension ("staving") injury treat as VPI. Improper immobilisation leads to a chronic spindle-finger and a disgruntled patient. All with swelling should have X-ray then neighbour strapping and next ARC. NSAIDs may help.

Extensor tendon injuries
These may be referred to the General Surgeons or Plastic surgeons for repair.

Flexor tendon injuries
Don’t forget to test both FDS and FDP - check flexion at DIPJ for profundus and flexion with uninjured fingers hyperextended for superficialis. Refer to Plastic Surgery in UDH.

Hand Infections
- acute paronychia - incise around the cuticle and nail-fold in the shape of the nail until pus expressed.
- Pulp (finger tip) abscesses should be drained by twirling a sharp-pointed scalpel round on them.
- suppurative tenosynovitis is a very serious condition which usually follows a trivial or forgotten finger prick. The finger is swollen, stiff and very painful - especially when bent back. -REFER TO PLASTICS
- Deep palmar infection – systemic upset, redness and swelling, pain when fingers are straightened – REFER TO PLASTICS

Finger tip Injuries (FTI)
These tend to look worse than they are. Providing no bone is exposed they can be dressed, immobilised and reviewed at next Emergency Department Clinic.
Leave children’s nails in situ. Adults’ nails should generally be removed if injured but this can be done next day if you are not sure what to do. Antibiotics are often indicated. If bone is exposed and you are unfamiliar with management, contact surgical SHO. Finger terminalization is not an ED procedure.

- **Amputation.** Providing no bone is exposed the finger can be dressed with “mepitel”, immobilised and reviewed at the next Emergency Department clinic. If bone is visible refer to plastics. Refer to plastics also if amputated part is available to assess possibility of re-implantation (usually not feasible).

- **Partial amputation (Adults).** This presents as a crush, a laceration or an avulsion of the nail. Primary repair of nail bed required if significant laceration. Refer to plastics if bone visible. Follow-up in ED if no bone visible – dress with mepitel and immobilise.

- **Partial amputation (Child).** Primary repair is rarely necessary – you should consult a senior doctor or the plastics SHO if there is a deep nail bed laceration. Other cases treated conservatively (as described above).

- **Antibiotics (Co-amoxiclav) are indicated if there is a compound fracture or if you suspect that the bone is exposed.**

Patients/parents will be particularly anxious about fingertip injuries. You must explain the prognosis and management plan very carefully to them. Advice is usually along the lines given below:

- FTIs are generally not as bad as they look and, although slow to heal, the final result is usually much better than they expect.

- In the case of complete amputation, the finger will be treated conservatively at first but, if it does not respond, amputation of a small section of their finger may be required subsequently.

- In the case of Partial amputation (Adults), you can discuss the options of nail removal and meticulous nail bed repair versus conservative treatment which will almost certainly result in permanent deformity of the nail. Many patients prefer to risk the latter!

- If you are dealing with partial amputation in a child you must explain that conservative management is usually as successful as primary repair but that dressings must be looked after carefully and that very occasionally the fingertip will eventually be lost because of the nature of the injury.

FTIs generate a lot of complaints so if a patient/parent expresses concern about your management plan you should discuss the case with an Emergency Department consultant or plastic surgeon.
KNEES (SEE ALSO LIMPING CHILD, FRACTURES, SOFT TISSUE INJURIES)

1. Trauma

Red Flags – refer to RVHFC
- Fractured Tibial Plateau
- Displaced fracture patella
- Acute Haemarthrosis
- Penetrating injury
- True locking
- Dislocated Knee (not patella!)

Key Points in History
- Mechanism is important: Direct blow (muscles and bones), stretch (ligaments) and/or twist (cartilage)?
- True locking or giving way are the key symptoms of loose body or cartilage tear
- Rapid swelling = haemarthrosis; gradual swelling = effusion
- Dislocations may relocate spontaneously so history may be the only remaining clue – patient may recognise description of patella or knee joint dislocation

Rapid Examination
- Look and feel for swelling, inflammation or wounds
- Palpate along the joint line for specific areas of tenderness (menisci)
- Test movement, especially extension – can the patient lift their knee off the bed (ie test extensor mechanism)?
- Stress the ligaments (mainly ACL and MCL) for any sign of a tear (see Soft Tissue Injury)

Management
- Significant haemarthrosis should be discussed with RVHFC
- Suspected rupture of extensor mechanism; x-ray patella and discuss with RVHFC
- Dislocated patella can be reduced immediately with entonox and immobilised in POP cylinder. Refer to Fracture Clinic
- Dislocated knee must be reduced immediately – entonox and morphine if not able to quickly and safely sedate. Even if reduced pre-hospital, urgent vascular assessment is indicated - discuss with RVHFC
- Suspected cartilage or ligament tear without haemarthrosis: Torn ligament cannot be excluded in the acutely painful knee because ligaments cannot
be adequately stressed. Explain this to the patient. NWB crutches and urgent physio. Ask GP to consider urgent orthopaedic referral if patient does not respond.

- All suspected penetrating trauma should be referred to RVHFC
- Fractures around the knee are rare but commonest after RTA. They can involve tibial plateau, patella, neck of fibula – discuss with RVHFC

**Ottawa Knee Rules**

A knee X-ray series is only required for knee injury patients with *any* of these findings:

1. Age 55 or older
2. Isolated tenderness of the patella (that is, no bone tenderness of the knee other than the patella).
3. Tenderness at the head of the fibula.
4. Inability to flex to 90 degrees.
5. Inability to bear weight both immediately and in the emergency department (4 steps; unable to transfer weight twice onto each lower limb regardless of limping).

**2. Non-traumatic knee pain**

KNEE X-RAYS ARE NOT INDICATED FOR ATRAUMATIC KNEE JOINT PAIN BUT REMEMBER THAT HIP PAIN MAY BE REFERRED TO THE KNEE.

**Pre-patellar Bursitis**

Learn to distinguish *bursitis*, which is obviously red and well demarcated, from a *joint effusion* which is more diffuse and associated with greater reduction in movement. *Bursitis* can be inflammatory or infective (less common) and can be treated expectantly with anti-inflammatories +/- antibiotics unless severe. Severe or non-responding bursitis may require I&D – discuss with senior ED doctor.

**Knee joint effusions**
The following knee effusions require immediate aspiration to exclude septic arthritis:
- All recently injected/aspirated joints
- All warm, tender joints with effusion
- All effusions if WCC or ESR raised
- Suspicion of TB
- All effusions in immuno-compromised patients (ADMIT)

A hot joint may be due to septic arthritis, Reiter’s disease, unexpected haemarthrosis or crystal arthropathy but you have to assume sepsis if the aspirate is cloudy-looking until negative cultures obtained. If the joint aspirate is straw-coloured, treat with NSAIDs and rest. Patient must be reviewed by GP. Blood usually follows forgotten minor trauma in a patient with degenerative disease and can be treated in the same way. Turbid joint fluid requires admission/discussion with a Rheumatologist.

Anterior knee pain
Causes include chondromalacia patellae (quads wasting), recurrent lateral dislocation of patella (apprehension test), patellar tendonitis (localized to tendon), Osgood Schlatter’s (“sporty kids” + swelling and tenderness over tibial tubercle), Osteochondritis Dissecans (locking joint – do an x-ray!). Rest, NSAID, Physio opinion, back to GP!

Locked Knee
- Inability to extend knee beyond a certain point.
- Pseudo-locking (esp children and young adults) responds to iv Pethidine followed by slow and gentle sustained pushing downwards into full extension.
- True Locking (usually older patient or known loose body / meniscus tear) does not usually respond to iv pethidine. Must be discussed with RVHFC urgently.

ANKLE AND FOOT (SEE ALSO FRACTURES, SOFT TISSUE INJURIES)

1. Ankle Injuries

History:
- Snap, crack or pop? – suggests significant bone or ligament injury

Examination:
INJURY AND MUSCULOSKELETAL

- Deformed or dislocated? Give entonox/IV morphine and pull straight at once or get help at once, then apply backslab POP – x-ray comes afterwards!

- Compound fracture? – Inadine, gauze and tape, iv Co-Amoxiclav, describe wound to fracture unit (Wound >1cm? contused, dirty or neurovascular complications?)

- Other cases- Ottawa ankle rules to decide if x-ray is needed (usually not needed). Next page.

First Aid
- Ice in a glove for ten minutes + analgesia

Management of sprains and fractures
- All fractures (except *) - SL backslab POP and discuss with RVH urgently
- If extremely swollen, can’t weight bear at all or small avulsion-type fracture(<0.5cm) use dynacast splint and review at ARC/CRC
- Vast majority – RICE advice(see soft tissue injuries) and DTG. Mobilise and self care for up to six weeks unless problems. Decision flow chart:
2. Foot Injuries

Fractures
- *Avulsion fracture 5th MT base and isolated metatarsal fractures* – Strapping and crutches if minor or POP if major. Refer to FC. Transverse(non-avulsion) fractures of 5th MT are an exception – discuss with RVHFC.
- Other foot fractures or abnormal separation of metatarsals – discuss with RVH FC
- Calcaneal fractures are serious and very easily missed- always look at the calcaneus on the x-ray and examine it clinically. There may be no fracture line, just a flattened appearance. Os calcis x-rays are indicated if suspicion.

Non-traumatic foot pain
*This is a high risk symptom*
- *Septic arthritis must always be excluded – temp and ESR*
INJURY AND MUSCULOSKELETAL

- Careful vascular assessment of whole leg (+capillary refill time)
- Focal bone tenderness + raised ESR – consider osteomyelitis
- Non-specific cases – Footwear advice, NSAID, crutches, GP review

Foot pain without evidence of serious underlying cause usually responds to a change of footwear.

| Ottawa Ankle and Foot Rules |

Ankle X-ray required if:
1. Pain in malleolar zone and
2. Bony tenderness at A or B
3. or an inability to weight bear immediately

Foot X-ray required if:
1. Pain in mid-foot zone and
2. Bony tenderness at C or D
3. or an inability to weight bear immediately
General Facts about Wound Care
- Tetanus +/- hepatitis, anti-bacterial prophylaxis should be considered
- Profuse bleeding can be controlled by a direct pressure dressing – consider underlying arterial damage even if pressure has arrested haemorrhage. Seek senior advice if necessary. Bleeding scalp wounds usually respond to skin suture and a temporary pressure dressing.
- Wounds must be thoroughly cleaned and explored (tourniquet if necessary)
- Where primary closure is planned, lacerations that are not right through dermis and less than 1cm long may be suitable for steri-strips or tissue adhesive glue. Larger or deeper wounds require suture or staples. Steri-strips or tissue adhesives should not be used across joints or Langers lines
- Lacerations crossing the vermillion border of the lip must be sutured meticulously – seek senior advice

Wound Breakdown
- Infection, ischaemia and foreign body prevent wound healing – if these are likely, suturing may not be the best option or delayed primary suture may be considered. Seek senior advice.
- All wounds caused by glass (including by mirrors) must be x-rayed (FB)
- Pre-tibial wounds should not be sutured (ischaemia)
- Seek senior advice before suturing flap lacerations (ischaemia)
- Grossly contaminated wounds and most bites should not be sutured – seek advice (infection)

Some common wounds / injuries and treatments are shown below.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Site</th>
<th>Treatment</th>
<th>Healing Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laceration</td>
<td>Face</td>
<td>Glue - superficial, &lt;3 cm, straight, tension free</td>
<td>5 days</td>
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<tr>
<td></td>
<td></td>
<td>Steristrips - straight, tension free</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Sutures - 6/0, non-absorbable</td>
<td>3-5 days</td>
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<tr>
<td>Scalp</td>
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<td>Glue - superficial, &lt;3 cm, straight, tension free</td>
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<tr>
<td></td>
<td></td>
<td>Sutures - 3/0 non-absorbable</td>
<td>7 days</td>
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<td></td>
<td></td>
<td>Staples</td>
<td>7 days</td>
</tr>
<tr>
<td>Over joints</td>
<td>Sutures - 3/0 and 4/0</td>
<td></td>
<td>10-14 days</td>
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<tr>
<td>Hands</td>
<td>Sutures - 4/0 and 5/0</td>
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<td>10 days</td>
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<tr>
<td>Trunk</td>
<td>Sutures - 3/0 or staples</td>
<td></td>
<td>10 days</td>
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<tr>
<td>Limbs</td>
<td>Sutures - 3/0 or staples</td>
<td></td>
<td>10 days</td>
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## INJURY AND MUSCULOSKELETAL

<table>
<thead>
<tr>
<th>Injury Type</th>
<th>Ankle</th>
<th>Knee</th>
<th>Wrist</th>
<th>Sprains</th>
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<tbody>
<tr>
<td>Ankle Sprain</td>
<td>DTG for 2-3 days</td>
<td>Grade 1 tear - DTG / Arthropad (2-3 days)</td>
<td>DTG for 4-6 weeks</td>
<td>Dynacast / elastoplast strapping for 2-3 days</td>
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<td>Grade 2 tear - DTG / Arthropad (consider physio)</td>
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<td>Grade 3 tear - cast/ knee brace &amp; d/w RVH</td>
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<td>(consider physio)</td>
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<td>RVH</td>
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<td>Knee Sprain</td>
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<td>Wrist Sprain</td>
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<tr>
<td>Volar Plate Injuries</td>
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<tr>
<td>Mallet Finger</td>
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<tr>
<td>Sprains</td>
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<tr>
<td>Tenosynovitis</td>
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### FALLS (SEE ALSO FITS, FAINTS AND FUNNY TURNS)

*It is negligent to ignore unexplained or recurrent falls!*

One third of elderly patients who present to the Emergency Department after a fall have an underlying cause for it (usually gait disturbance, visual impairment or cardiovascular disorder including drug effects). All patients aged 65+ who have fallen should be screened for unexplained or recurrent falls by taking a careful history of the event. NICE Falls: assessment and prevention of falls in older people 2013 gives further advice.

**Patients with unexplained or recurrent falls who are fit for discharge must have:**
- CVS and CNS examination
- a sight test (fields and acuity)
- a gait assessment (in hours this is carried out by physio, other times doctor & nurse. Don’t forget Parkinson’s disease!)
- an ECG, + BP erect and supine, interpreted in conjunction with their full medication list.

They can be followed up in community by the GP or community rehab team.
Patients with possible hip fractures are usually managed through minors. They need timely assessment to provide adequate pain relief as soon as they arrive in hospital – consider morphine 5-10mg IV given in aliquots. Reassess pain 30 mins after administration of initial analgesia.

Femoral nerve block is a useful adjunct to pain relief but should only be performed if competent.

Typically there is a history of fall with a shortened, rotated leg. Check neurovascular status of limb. Do not forget to assess why the patient fell – this often includes ECG, FBC / U+E and other investigations as clinically indicated.

Once diagnosed, liaise with orthopaedic SHO in RVH to arrange transfer of the patient to RVH. Antrim Hospital does not have fracture beds and patients should not be boarded in Antrim awaiting a fracture bed. Treat and stabilise any life threatening medical conditions prior to transfer.
DOMESTIC VIOLENCE

- Abuse can be experienced by
  - Children
  - Spouses / partners
  - The elderly and vulnerable adults (elder abuse)

You need to have a high index of suspicion to identify this. Patients require privacy for this kind of conversation and sometimes a member of the nursing staff may be more appropriate to explore this possibility with the patient.

"Suspicious Seven" of domestic violence -
- all women with injuries due to assault arriving by ambulance after midnight
- all women with the combination of defensive arm injury with scalp/facial injuries
- all women presenting with a more than two hour delay from the time of injury particularly those presenting more than 24 hours after loss of consciousness
- all women with a history of a “fall” downstairs and injuries above the waist
- all pregnant women with abdominal injuries
- all women injured by weapons
- all women with multiple attendances due to trauma

We can help women by offering to contact the police, careful documentation of their injuries so that they can contact a solicitor regarding a civil action and/or giving them our written literature about the Domestic Helpline. Ensure that someone discusses a “crisis plan” with the patient, giving advice about how they should prepare in advance for a sudden departure with their children.

OSTEOPOROSIS

Low impact fractures are those associated with minor trauma. In post-menopausal women such fractures occur in the wrist, spine and neck of femur. Please also consider pathological fractures. Remember if the bone is tender following a fall, you must x-ray the painful bone. Not all fractures show on x-ray, therefore clinical suspicion must be low for a fracture. Once treated please advise them to attend their GP for further advice re osteoporosis. After diagnosis of the first osteoporotic vertebral fracture, x-rays are not indicated to diagnose further osteoporotic fractures in the appropriate clinical context.
Current national guidelines for the management of lower back pain are given on the next page. Get into the habit of using this diagnostic triage system as it will greatly improve your own efficiency and satisfaction in dealing with these patients.

You must be familiar with the criteria for urgent referral to a neurosurgeon.

The primary care management of simple backache is the responsibility of the patient and their GP. Note that patients should be advised to rest in bed for no more than two days after which they should gently mobilise, ideally with the assistance of a physiotherapist. Stress that medical research has shown that patients who resume normal activities (e.g. work, hobbies, sport) get better more quickly than others. Patients should be asked to attend their GP for follow-up. Patients should never be admitted to Antrim Hospital for the treatment of low back pain. GPs will frequently refer patients with intractable back pain to the Emergency Department, not because of “red flags” but because of intolerable pressure from patients and relatives. Be patient in this situation – the whole family are often at their wits’ end. Take a full history and listen to the carer as well as the patient. Ascertain what social support is available. Perform a meticulous examination. Medical management decisions should be made according to the diagnostic triage protocol. If no red flags exist you cannot arrange emergency admission to hospital. Explain this to the patient and warn them about red flag symptoms such as bladder upset or weakness. Tell patient that their GP is the only person who can refer them to the Orthopaedic service urgently and that you will contact the GP to advise this. Maximise analgesia and social support. If they remain very dissatisfied, speak to a senior Emergency Department doctor.
DEPARTMENT OF A&E MEDICINE
DIAGNOSTIC TRIAGE OF A PATIENT PRESENTING WITH LOW BACK PAIN

What is the pain due to?

A problem in the back

A problem elsewhere →
Appropriate diagnosis and management

Is there a spinal cord or cauda equina lesion?
(Sphincter disturbance, gait disturbance, saddle anaesthesia)

No

Back Pain — diagnostic triage and use your judgement to categorise the patient into one of the following groups

Spinal Pathology
Either – onset <20 or >55 or Non-mechanical pain or Thoracic Pain or Phx Ca, Steroids, HIV or Unwell, weight loss or Widespread neurology or Structural deformity

Possible serious pathology

Yes

Is there progressive/severe motor weakness?

No

Primary Care Management 4–6 weeks

Is it settling?

Yes

Primary Care Management

No

X-ray +/or Urgent Specialist Referral

Urgent referral to neurosurgeon

Nerve Root Problem
Either - Unilateral leg pain=LBP or Radiates to foot/toes or Numbness and anaesthesia or SLR reproduces pain in back or Localised neurology

Simple Backache
Either – Onset 20–55 or Lumbosacral buttocks and thigh or Mechanical pain or Patient well

Primary Care Management
CAUDA EQUINA SYNDROME (CES)

Remember that patients with CES may have no leg signs

This is a very difficult diagnosis.

2 categories

1. CESI - an incomplete lesion
   Impairment of bladder/saddle sensation and difficulty with micturition, but the patient remains continent

2. CESR - a complete lesion
   The patient has painless urinary retention with dribbling overflow incontinence

At the outset the patient will be constipated through loss of the parasympathetic innervation to the descending colon, even although anal tone is lax. Faecal incontinence is a very late sign.

The patient in pain who is having difficulty with voiding purely for mechanical reasons is aware that the bladder is full, retains the desire to micturate, has normal sensation in the saddle region, and a tender bladder.

In contrast, the patient developing CES will develop some or all of the following:

- Altered saddle and/or urinary sensation
- Perineal/rectal pain
- Reduced awareness of bladder filling
- The need to strain to maintain urine flow

It is important that the diagnosis is considered, ask appropriate questions and record them and finally give good advice about the development of such symptoms and to seek urgent medical attention.

Such cases should be discussed with the appropriate middle grade or on-call consultant.