

BENDIGO HEALTH EMERGENCY DEPARTMENT



NURSE INITIATED X-RAYS AT TRIAGE



Excellent Care. Every Person. Every Time.

Introduction

Patient's presenting to the Emergency Department (ED) with distal limb injuries are regularly faced with lengthy waits prior to definitive care. The majority of patients presenting with limb injuries undergo x-ray examination. A nurse initiated study at The Western Hospital, Victoria, concluded that nurse initiated x-rays for limb injuries showed significant reductions in time spent waiting by patients (Kelly 1995: 84). The process at the Western Hospital was shown to be accurate, efficient and cost effective (Kelly 1995: 84). Implementation of nurse initiated x-rays will foster the development of an advanced practice role for senior nurses who rotate through the triage position. If the triage nurse is able to decrease the patients waiting time in ED by initiating the appropriate x-ray, we anticipate this will improve patients overall satisfaction with their ED experience and patient flow within the department.

Aim

- The aim of this learning package is to support the introduction of nurse initiated x-rays in the ED for patients with isolated distal limb injuries.
- To ensure triage nurses are provided with appropriate information regarding anatomy and pathophysiology of distal limb injuries.
- To have a clear understanding of how to apply the Ottawa ankle rules.
- To be able to perform limb assessments effectively at triage.
- To become competent at ordering radiological investigations.

This competency has been designed to be completed by ED nurses who currently have a Post Graduate Diploma or Certificate in Critical Care or Emergency Nursing, or registered nurses who have at least twelve months triage experience at BH.

This learning package is to be read in conjunction with the Policy and Procedure on Nurse Initiated X-ray at Triage. If further education is required, please see the CNC.

Purpose

After successfully completing the nurse initiated x-ray competency package the nurse will be able to:

- Provide a rapid, accurate assessment of distal limb injuries at triage.
- Order medical imaging early to facilitate more timely intervention and management of the patient.
- Decrease the waiting times of patients presenting to the ED with distal limb injuries; and
- Improve staff and patient satisfaction.

COMPETENCY ASSESSMENT

The competency consists of 2 parts:

1. An education package including:
 - Obtaining a patient history at triage
 - Patient assessment at triage
 - Ottawa ankle rules
 - Distal limb injury flow charts (Refer to Appendix 1)
 - Pain assessment tool
2. A post education test of fifteen questions (ten of which are multiple choice) with competency demonstrated by 85% correct answers.

Prerequisites for Competency

Nurse initiated x-rays are only to be ordered by triage nurses who are currently employed in the ED at BH and have a Certificate or Graduate Diploma in either Critical Care or Emergency Nursing, or alternatively have at least 12 months of triage experience at the BH ED. The triage nurse will only be permitted to initiate x-rays at triage after successfully completing the two part competency package.

The Triage Nurse will be able to initiate x-rays for

- Simple injuries of hand, wrist forearm & elbow
- Simple injuries of foot, ankle lower leg and knee
- Chest for suspected # ribs, or suspected pneumothorax in a pt with no respiratory compromise.

Inclusion Criteria for Nurse Initiated x-rays

- Patient's ≥ 9 years of age for distal limb X-ray
- Patient's ≥ 16 years of age for Chest X-ray
- Patient's with a distal limb injury to either hand / wrist / elbow.
- Patient's with a distal limb injury to either ankle / foot / knee.

Exclusion Criteria for Nurse Initiated x-rays

- Patient's < 9 years of age.
- Patient's < 16 years of age for chest X-ray.
- Pregnant women, or women of child bearing age who may be pregnant.
- Intoxicated people.
- Drug affected people.
- Patient's undergoing chemotherapy or have a history of bony cancer.
- Multi trauma patients.
- Patients with head injuries or neurological deficits.
- Severe pain
- Patient's with respiratory distress

These patients all require an urgent Triage Category and medical assessment prior to x-ray.

Inclusion Criteria

A number of 'decision rules' regarding ankle injuries have been published. The Ottawa Ankle Rules can be used by the triage nurse in assessing the need for ankle and foot radiography. Refer to Appendix 3 for the Ottawa Ankle Rules.

The Director of Emergency has suggested that anybody presenting with a painful and tender elbow / wrist / hand / fingers / knee would be appropriate candidates for nurse initiated x-rays. Providing a thorough assessment of the affected limb has been undertaken, if the triage nurse is unsure of whether the patient's injury warrants an x-ray this should be discussed with the Senior ED MO.

Patients who present with chest wall pain and a history of sudden onset of pain and mild dyspnoea, and whose vital signs are not compromised and therefore are able to wait in the waiting room, can have a nurse initiated chest X-ray to exclude pneumothorax and/or # ribs.

THE PROCESS

Take a history

- Mechanism and time of the injury.
- Treatment / medications given prior to arrival to the ED.
- Signs and Symptoms. Noises heard ('popping' and 'snapping' noises indicate severity).
- Was it a simple trauma? (trip, pushed, fall, kick)
- Was there a possible medical cause? (eg: syncope, Arrhythmia, LOC).
- What was the magnitude? (metres)
- Point of impact
- Previous injury/ies in this region
- Ability to weight bear immediately & in the ED

Inspection

- The location and nature of pain.
- The point of maximum tenderness (ensure this is included on the x-ray request).
- Ask the patient about previous ankle sprains (which make the patient more prone to similar injuries).
- Determine whether the patient was able to weight bear immediately after the injury, and in the ED (inability to weight bear immediately & in the ED can signify serious injury such as a fracture).
- Note the colour, position, and any obvious differences between the injured and uninjured limb.
- Look at the affected limb for any obvious swelling, deformity and any abnormal angulation or any breaks in the skin.
- Assess the patient's ability or inability to move the affected area (range of movement) and note any pain associated with this.

Palpation

Gently palpate the affected limb, start away from any obvious deformity or injury and move towards it.

Is the pain localised over bone or diffuse?

Assess sensation distal to injury.

Palpate pulses and compare with other limbs.

Palpate peripheries warmth and coolness in regards to neurovascular compromise.

Palpate and identify areas of maximum tenderness.

Vital Signs

Full set of temperature, pulse, respiratory rate & blood pressure.

Neurovascular Observations of affected limb.

Clinical Signs of a Fracture

- Pain
- Deformity
- Bony tenderness

AND

- Swelling
- Contusion
- Crepitus
- Loss of function

Limb Pain Assessment (The 5 P's)

Pain

Note the location of quality of patient's pain level (visual analogue scale) and the area of maximum tenderness.

Pallor

Inspect the area for colour capillary return and temperature. Pallor, sluggish capillary return or cool skin can indicate vascular compromise.

Pulses

Palpate pulses distal to injury and compare the quality of this pulse with the uninjured extremity.

Paraesthesia

Determine if the patient has lost any loss of sensation in extremity since the injury occurred.

Paralysis

Establish if the patient is able, or has moved the extremity since time of injury.

First Aid

Ensure that all patients receive appropriate first aid for their distal limb injuries. Immobilise the limb with a sling to the wrist and forearm injuries, and enforce rest, ice, compression, elevation (RICE) to all injuries where appropriate.

X-rays

Emission of x-ray beams penetrate tissues to varying degrees according to their density (Marieb 1995: 18). The radiograph is produced when the x-rays are exposed to a photosensitive surface. Graduations of grey appear on the radiograph depending of how dense the tissue is, i.e. the denser the tissue the less exposure the film has to the x-rays and the lighter the picture will appear (Marieb 1995: 18). The four densities of an x-ray film are:



AIR – shows as black

FAT – shows as shadowy

FLUID – shows as grey

BONE – shows as white

The purpose of an x-ray is to aid in the diagnosis and management of patient's problem, it should be asked 'is the x-ray going to change how we manage this patient?' If not, then the x-ray is unnecessary.

When taking the x-ray, the radiographer will take at least two views of the area requested at right angles to each other; this is because the fracture may only be visible on one plane depending on alignment. They will also include the joint at either end of the suspected bone that is fractured to exclude any concurrent dislocation.

Please note: When completing the x-ray request please ensure that you have clearly documented the point of maximum tenderness → The Radiologist needs to know where to look.

Prerequisite knowledge

ANATOMY

The ankle joint consists of three bones, the tibia (medial malleolus), the fibula (lateral malleolus) and the talus. These are supported by three groups of stabilising ligaments (Marieb 1995: 212). The foot is comprised of seven tarsal bones, five metatarsal bones and five phalanges each consisting of proximal, medial and distal, except the great toe. These are also supported by ligaments (Marieb 1995: 212).



(Anon 2005: 20)

1. Ankle Injuries

Most twisting ankle injuries results in 'sprains' (tearing of the supportive ligaments of the ankle). Of these 85% involve the lateral ligaments as the ankle is more prone to inversion (McRae 1998: 321). However, inversion injuries (foot rolling with sole pointing inward) can also result in fractures of the lateral malleolus and less commonly eversion injuries (foot rolling with sole pointing outward) can result in medial malleolus fractures (McRae 1998: 321). Other mechanisms of injury can include direct blows and falls during various recreational activities. Potts fractures result from twisting forces, vertical compression forces or a combination of two (McRae 1998: 321). Patients may present non-weight bearing with deformity, swelling and tenderness (often as a result of sporting injuries).

Ankle x-ray request: Ankle x-ray please (? # Lateral Malleolus (Lau 2001: 203).

2. Foot Injuries

Fractures of the calcaneus can occur when landing on one or both feet from a height. Patient usually falls from a height landing on one or both heels. **NB: Spinal injuries may be concurrent** (McRae 1998: 351). Ensure a thorough history is obtained from the patient. Check at triage for back and neck pain, and any altered sensation to limbs. If any of these signs are present place the patient on a trolley, and refer to a Senior Doctor immediately.

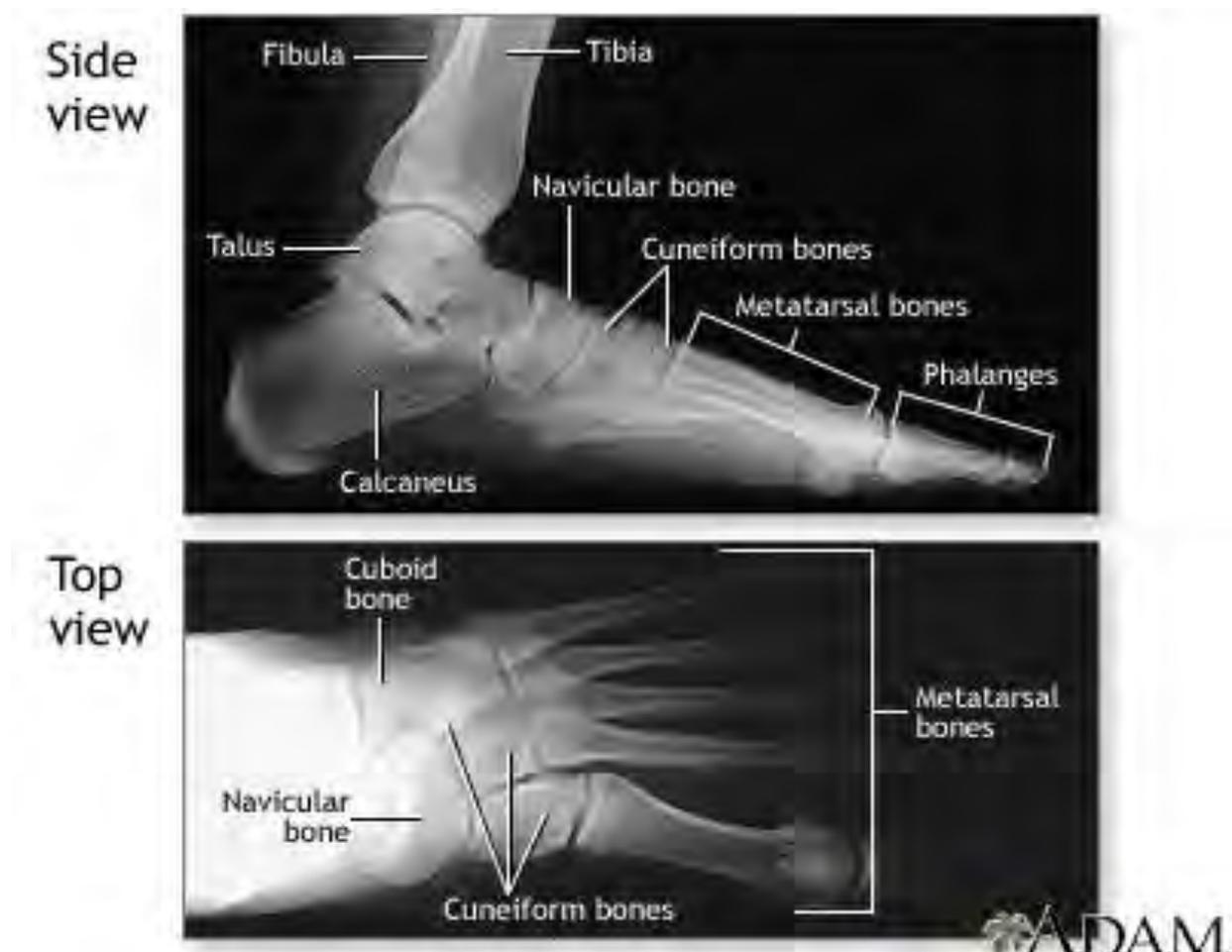
Foot injuries x-ray request: Ankle and Heel x-ray please – Lateral and obliques views of the calcaneum (Lau 2001: 202)

2.1 Fractured base of 5th Metatarsal

Mechanism of injury

Occurs with forced inversion and plantar flexion resulting in a bony avulsion (McRae 1998: 360). Lateral foot pain and swelling (McRae 1998: 360). Most metatarsal injuries occur from heavy objects on the foot, a twisting injury of occasionally fatigue or stress fractures. Most commonly missed fracture.

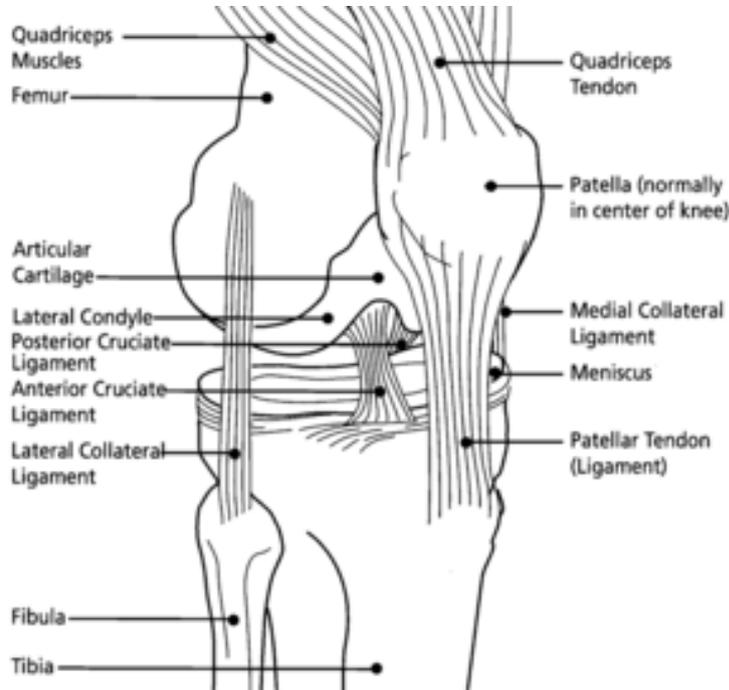
X-ray Request: Discuss with Senior Emergency MO prior to x-raying patients who present with this type of injury to ensure the correct x-ray view.



Knee Injury

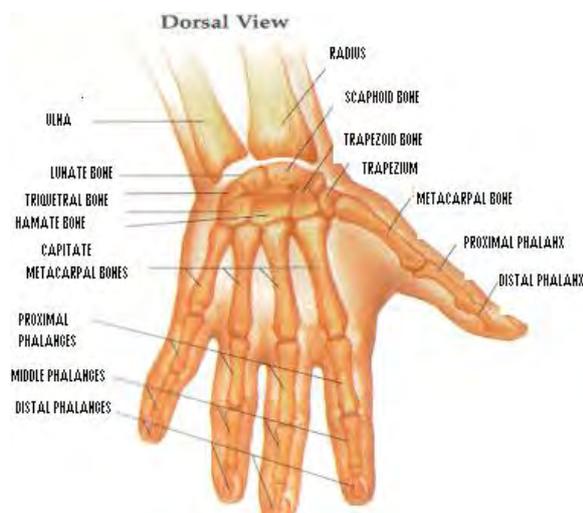
Knee injuries are caused by rotation, hyperflexion or trauma. Injury may involve the cartilage, ligaments, meniscus, or bone. On examination there may be swelling, bruising, effusion and /or pain.

X-ray request: Knee Xray please. Include mechanism of injury and point of maximum tenderness.



UPPER LIMBS

The radius and ulna are bound together by the annular ligament, the interosseus membrane, the radioulnar ligaments and fibrocartilage (McRae 1998: 157). The proximal and distal radioulnar joints are pivot joints between the radius and ulna (Marieb 1998: 206). Movements of pronation and supination take place at these joints. The radius and ulna meet at the hand to form the wrist.



(Anon 2005: 20)

Three sets of joints connect the radius and ulna to the bones of the palm (metacarpals), via the eight small wrist carpals (Marieb 1995: 206). Further, the knuckles (metacarpophalangeal, or MCP, joints) connect the metacarpals to the proximal phalanx of the fingers. Each finger has 3 phalanges (proximal, middle, distal), except the thumb which has only two (Marieb 1995: 206). The scaphoid bone plays a key role in wrist and carpal function.

3.1 Fractures of the Forearm

Twisting or rotational forces produce spiral fractures of the radius and ulna, these can occur at different levels. Both are notoriously prone to severe displacement (McRae 1998: 157). Patients may have no angulation but pain over point of fracture.

Direct violence to the forearm can fracture either of the forearm bones in isolation, causing a transverse fracture. This can occur when the shaft strikes a hard edge (especially the ulna) (McRae 1998: 156). This may also occur when the forearm is struck by a weapon and the arm is lifted up to protect.

Indirect violence more commonly the forearm is injured as a result of indirect violence, such as a fall onto the back or the front of an outstretched hand. The force of impact on the hand stresses the forearm bones (McRae 1998: 156). Commonly both the radius and ulna are fractured. Compartment syndrome can occur more frequently with fractures of the radius and ulna together.

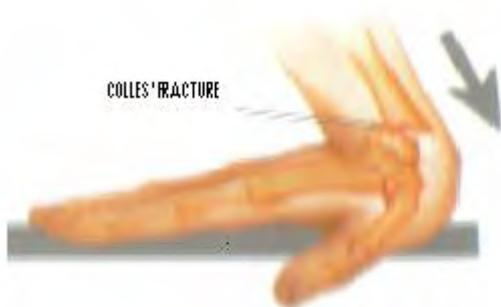
Forearm x-ray request: Forearm x-ray please (? # Radius and Ulna) (Lau 2001: 196)



Wrist Injuries

3.1.1 Colles Fracture

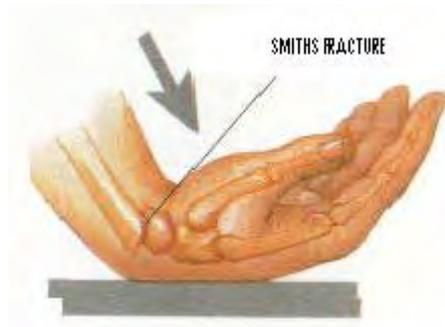
A Colles fracture is a fracture of the distal radius within 2.5cm of the wrist joint (McRae 1998: 170). Displacement may occur radially resulting in a 'dinner fork' appearance. This fracture is common in the elderly who fall onto an outstretched hand (McRae 1998: 170). This is the most common type of fracture. Osteoporosis is a contributory factor. There is pain over the site of the injury.



(Anon 2005: 21)

3.1.2 Smith's Fracture

This injury results from a fall onto the back of the hand. The distal radial fragment is tilted anteriorly (posterior angulation), and may be displaced posteriorly (McRae 1998: 181). This fracture is usually impacted. This is frequently referred to a 'reversed colles fracture,' because the deformities when viewed from the side are in the opposite direction than that seen in a colles fracture.



(Anon 2005: 21)

3.1.3 Scaphoid Fracture

A scaphoid fracture results from falling onto an extended arm and open hand. This fracture should be suspected when there is pain in the lateral aspect of the wrist following any injury. Anatomical 'Snuff box' tenderness is suggestive; however wrist sprains without fracture give rise to tenderness in this area. In a true scaphoid fracture, tenderness will be present upon application of pressure over the dorsal and palmer aspects of the scaphoid (McRae 1998: 182). Because of its vascular anatomy, the bone is susceptible to avascular necrosis, and poor union (McRae 1998: 182). Degenerative arthritis of the wrist can occur, especially with neglected fractures.

Wrist x-ray request: Wrist x-ray please (? # scaphoid) (Lau 2001: 196).

3.2.1 Fractures of the hand

Metacarpal and Phalangeal Fractures

Crush injuries can fracture the metacarpal bones. Punching injuries are generally associated with metacarpal fractures, especially with 5th metacarpal. Angulation and impaction are also common 5th metacarpal fractures (McRae 1998: 191).

Sports injuries, including a hard ball hitting an outstretched finger/thumb can result in phalangeal fractures. The most common injury to thumb involves the base, and a fracture / dislocation can occur. This injury results from force being applied along the axis of the thumb, from a fall or blow on the clenched first for example (McRae 1998: 191). Forced abduction of the thumb can also produce base of thumb fracture / dislocations (McRae 1998: 191). This can be mistaken for a scaphoid fracture, however tenderness is more distal to the snuff box. Fractures of the carpal and metacarpal bones often present with marked swelling and / or bruising over the site of the injury (McRae 1998: 191). Ensure capillary refill < 2 seconds.

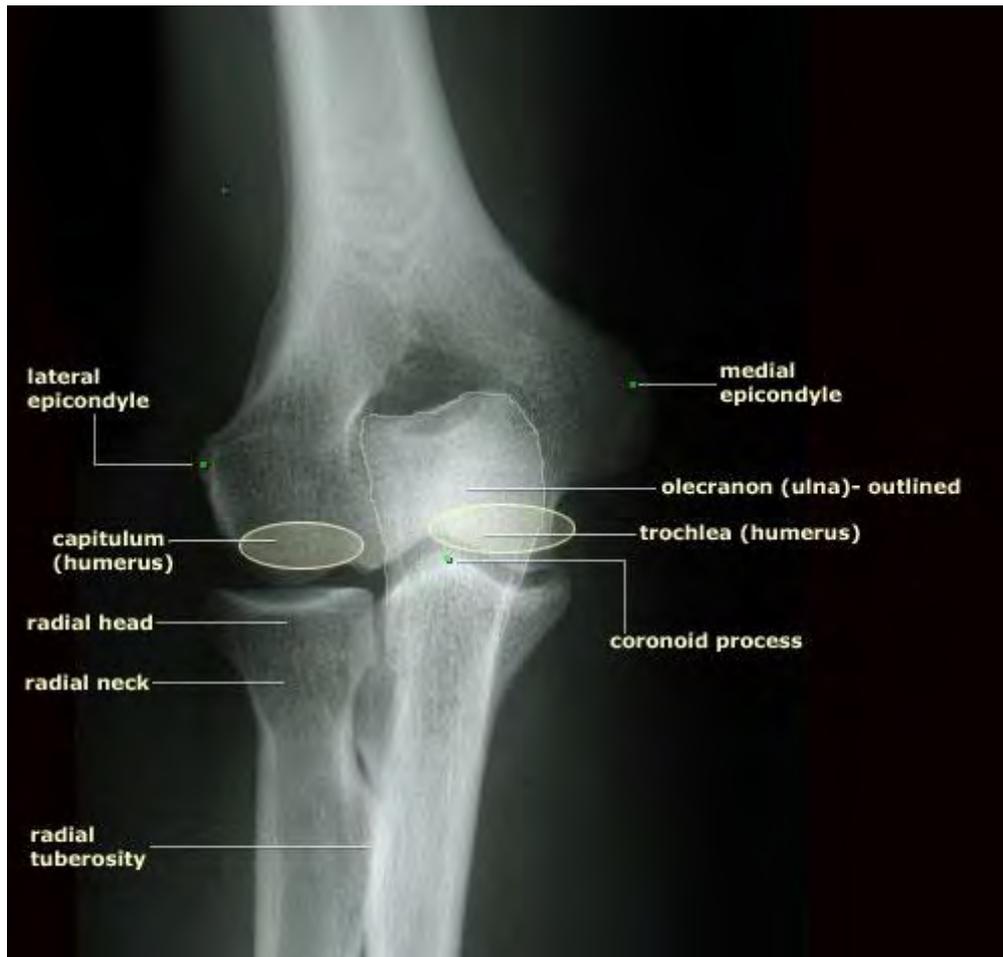
Hand x-ray request: Hand x-ray please – stating specific area of injury and scaphoid views where indicated (Lau 2001: 196).

3.2.2 Other Carpal Fractures

Fractures through the bodies of any of the carpal bones, other than the scaphoid is rare. Small chip (avulsion) fractures of the carpals are common and usually results from hyperflexion / hyperextension injuries of the wrist (McRae 1998: 191). Direct violence can be responsible.

Elbow Injury

In adults the common mechanism is fall onto outstretched hand with elbow in extension. Clinical findings are of loss of arm length, painful movement and swelling. Examine for signs of neurovascular compromise.



Documentation and Patient's Ongoing Management

Procedure

- Assess the patient/limb and triage according to Australasian Triage Scale (ATS)
- Question women regarding pregnancy status
- Apply R.I.C.E. Splint/sling as appropriate.

Document on the x-ray request, in a clear and concise manner and ensure the following is included

- The correct limb and area to be x-rayed
- Brief clinical notes
- Mechanism and point of maximum tenderness
- The type of imaging (eg Ankle views, L) wrist views)
- If the patient is infectious / SCOVID

Documentation

- Document in the emergency notes assessment findings, including peripheral neurovascular observations and document the time the patient went for their x-ray and what region of the body was x-rayed.
- Direct the patient to the waiting room and complete the x-ray request in ePR. Explain to the patient that the radiographer will call them from the waiting room and after the x-ray they are to return to the waiting room until medical officer consultation, x-ray interpretation and treatment. The patient will be seen in order priority as per the National Triage Scale.
- If the patient is assessed as not needing an x-ray then the patient should be treated as a sprain and triage accordingly. Give the patient an explanation as to why they do not require an x-ray. The patient still needs to be seen by an ED doctor prior to being discharged from the department.
- Patients with ankle sprains should not be considered as incidental presentations. Significant sprains can result in longstanding loss of function and can be painful in the acute phase. These injuries may need physiotherapy and in severe injuries orthopaedic surgery or casting (complete ligament rupture).

Responsibilities of the Triage Nurse Post x-ray

- Continue peripheral neurovascular observation and ongoing assessment as per normal triage process, if patient in waiting room.
- Explain to patient to notify triage nurse if pain worsens, limb becomes cool, pale or altered sensation.
- Implement / continue with R.I.C.E.
- Upgrade triage category if indicated.

Distal Limb Injuries Ankle /

Triage as per ATS

Inclusion Criteria

- ◆ ≥9 years distal limb Xray
- ◆ ≥16 years Chest Xray
- ◆ Simple injury excluding knee injuries

Possible fracture if

- ◆ Pain
- ◆ Swelling
- ◆ Tenderness
- ◆ Crepitus
- ◆ Loss of function (Decrease ROM, Non weight bearing)

Look at the Ottawa Ankle Rules Chart
Does the patient meet the x-ray criteria?

YES

Initiate an X-ray at triage if inclusion criteria met

First Aid

R.I.C.E

Complete x-ray Request on ePR

- ◆ Mechanism of Injury
- ◆ Document clearly in the Emergency Notes x-ray attended and relevant assessment details
- ◆ List if infectious ie. SCOVID

Instruct patients to return to the triage desk once their x-ray is completed

Exclusion Criteria

- ◆ <16 yrs (chest xray) <9yrs Distal Limb
- ◆ Pregnancy / or maybe pregnant
- ◆ Dislocations
- ◆ Neurovascular Compromise
- ◆ Multi-trauma
- ◆ Intoxicated
- ◆ Patients currently undergoing chemotherapy or have a history of bony cancer
- ◆ Compound Fracture
- ◆ Severe Pain
- ◆ Radiology is closed

These patients require URGENT Medical Assessment by a Senior ED MO.
Check Major Trauma Criteria Flow Chart

Patient does not meet nurse initiated x-ray at triage criteria – Wait for an ED MO to see patient

First Aid

Analgesia
R.I.C.E.

Appendix 1B

Distal Limb Injuries Hand / Wrist

Triage as per ATS

Inclusion Criteria

- ◆ ≥9 years distal limb Xray
- ◆ ≥16 years Chest Xray
- ◆ Simple excluding elbow injuries

Possible fracture if

- ◆ Pain
- ◆ Swelling
- ◆ Tenderness
- ◆ Crepitus
- ◆ Loss of function

Nurse Initiate an x-ray at Triage

First Aid

- ◆ Sling
- ◆ R.I.C.E

Complete X-Ray Request on ePR

- ◆ Mechanism of Injury
- ◆ Document clearly in the Emergency Notes x-ray attended and relevant assessment details
- ◆ List if infectious ie. SCOVID

Instruct patients to return to the triage desk once their x-ray is completed

Exclusion Criteria

- ◆ <16 yrs (chest xray)
- ◆ <9yrs Distal Limb
- ◆ Pregnancy
- ◆ Dislocations
- ◆ Neurovascular Compromise
- ◆ Multi-trauma
- ◆ Intoxicated
- ◆ Currently undergoing chemotherapy or have a history of bony cancer
- ◆ Compound Fracture
- ◆ Severe Pain
- ◆ Radiology Closed

These patients require URGENT Assessment by a Senior ED MO. Check Major Trauma Criteria Flow Chart

Patient does not meet nurse initiated x-ray at triage criteria – Wait for an ED MO to see patient

First Aid

- ◆ Sling
- ◆ R.I.C.E

Appendix 2

Name.....

Post Learning Package Test

Theoretical Exam

The pre test will be applied prior to the participant receiving the nurse initiated x-ray education and the post test will be immediately after the education session.

1. The majority of ankle sprains are by which of the following positions?
 - a. Eversion
 - b. Inversion
 - c. Dorsiflexion
 - d. External rotation

2. Which of the following tissues / substances shows black on the x-ray?
 - a. Fat
 - b. Bone
 - c. Fluid
 - d. Air

3. Which of the following bone does not make up the ankle joint?
 - a. Tibia
 - b. Fibula
 - c. Calcaneus
 - d. Talus

4. A 20 year old male 'hops' to the triage nurse saying that he has 'twisted' his right ankle playing football and it hurts to weight bear. He has previously had multiple similar injuries to that ankle without a fracture. He also adds that he heard a 'crack' when he sustained the injury. He is unable to weight bear on his injured right ankle whilst in the ED. Which answer identifies what you would you do as the triage nurse?
 - a. Not initiate an x-ray at triage, it is not required
 - b. An additional physical assessment is needed
 - c. Order an ankle x-ray
 - d. Order a foot x-ray

5. A 50 year old female walks up to the triage with a mild limp complaining of pain in the right

ankle after 'rolling' her foot on an uneven footpath. There is swelling around the lateral malleolus, but no bruising. There is no focal bony tenderness. Which is the most appropriate action regarding the management of this patient if you were the triage nurse?

- a. Request a foot x-ray
 - b. Request an ankle x-ray
 - c. Strap the ankle, fit crutches and give information regarding care of an ankle sprains
 - d. Ask the patient to wait for a medical assessment (An x-ray is not requested at triage)
6. Which answer is not part of the inclusion criteria for a nurse initiated distal limb x-ray at triage?
- a. Patients ≥ 9 years of age
 - b. Severe Pain
 - c. Distal limb injury to the foot
 - d. Distal limb injury to the wrist
7. Which answer is not part of the exclusion criteria for a nurse initiated distal limb x-ray at triage?
- a. Non weight bearing patient
 - b. Patients < 9 years of age
 - c. Pregnant women
 - d. Heavily intoxicated
8. When completing a NIXR request at triage which of the following would you *not* include?
- a. Infectious status
 - b. Mechanism of injury
 - c. Document in Emergency notes
 - d. Triage Category
9. Which bone is not part of the Ottawa Ankle Rule?
- a. Lateral malleolus
 - b. Metacarpal
 - c. Medial malleolus
 - d. Navicular
10. Why does the radiographer take two views of the affected limb?
- a. The Ottawa Ankle Rule states you only need to take one x-ray view
 - b. Increase their x-ray funding
 - c. The fracture may only be visible on one plane
 - d. Practice their skills

11. Describe the mechanism of injury and likely assessment findings for

Ankle Fracture

Metatarsal Fracture

Ligament Injury

12. State the clinical findings for a foot x-ray to be requested using the Ottawa Ankle Rule

13. Outline the procedure for nurse initiated x-rays at triage

14. What are the responsibilities of the triage nurse after the patient has returned from x-ray?

15. List the three clinical signs of a fracture

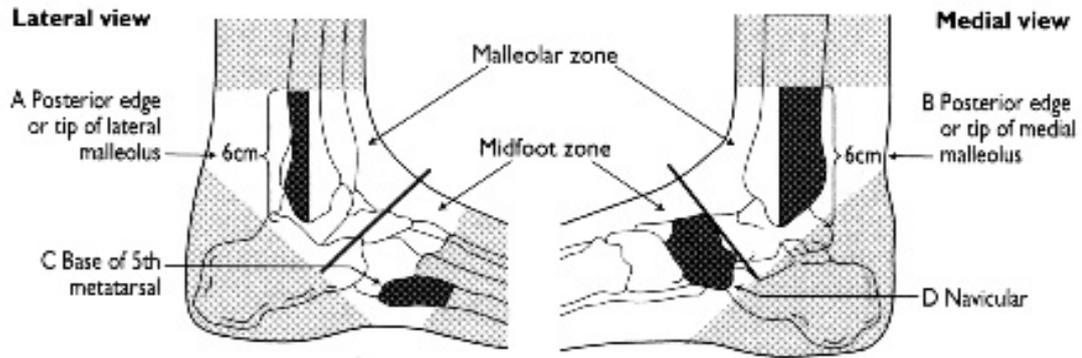
1) _____

2) _____

3) _____

Appendix 3

Ottawa Ankle Rules



An ankle x ray series is required only if there is any pain in malleolar zone and any of these findings:

- Bone tenderness at A
- Bone tenderness at B
- Inability to bear weight both immediately and in emergency department

A foot x ray series is required only if there is any pain in midfoot zone and any of these findings:

- Bone tenderness at C
- Bone tenderness at D
- Inability to bear weight both immediately and in emergency department

Ottawa ankle rules for use of radiography in acute ankle injuries (Stiell et al 1995: 595)

Appendix 4

Limb Fractures

| Fracture | Mechanism of injury | Assessment |
|--------------------------------|---|--|
| Avulsion injuries | <ul style="list-style-type: none"> • Inversion injuries • Stepping into a hole, off a curb | <ul style="list-style-type: none"> • Pain, swelling, bruising, reduced ROM, difficulty weight bearing. Can be due to ligament rupture, or may tear small portions of bone off the foot area (small avulsion fracture). • Can occur at either end of the ligament, usually at the lateral malleolus, talus, calcaneum or navicular bones. |
| Metatarsal Fracture | <ul style="list-style-type: none"> • Direct trauma, crush injury • Jump or fall on ball of foot | <ul style="list-style-type: none"> • Pain, swelling, bruising • Tenderness on palpation |
| Toe Fracture | <ul style="list-style-type: none"> • Object falling onto toe • Stubbing toe | <ul style="list-style-type: none"> • Pains, swelling, bruising • Tenderness on palpation |
| Calcaneus Fracture (Heel bone) | <ul style="list-style-type: none"> • Jumping / falling from a high surface onto heels | <ul style="list-style-type: none"> • Pain, swelling, bruising • The heel is wider, shorter, and flatter when viewed from behind • Non/Partial weight bearing |
| Ankle Fracture | <ul style="list-style-type: none"> • Inversion or eversion injury • Stepping into a hole • Skateboards/rollerblades • Steps / curbs • Walking on uneven surfaces • Platform shoes • Stepping into a hole • Skateboards/roller s | <ul style="list-style-type: none"> • Pain, swelling, bruising, difficulty weight bearing. • Pin on flexion, extension, rotation. • Ligament injury produces the same symptoms. An ankle fracture is usually accompanied by ligamentous injury and bony tenderness over the malleolus |
| Radius and Ulna Fracture | <ul style="list-style-type: none"> • Direct trauma • Fall onto outstretched hand • # of ulna alone rare • Twisting or rotational forces (spiral fractures) | <ul style="list-style-type: none"> • Localised swelling and tenderness, bony crepitus • Adults – significant swelling • Reduced ROM • Painful pronation - supination |
| Scaphoid Fracture | <ul style="list-style-type: none"> • Fall onto outstretched hand | <ul style="list-style-type: none"> • Pain in lateral wrist • 'Snuff box' tenderness • Swelling is not necessarily present • Tenderness on palpation • Positive axial compression |
| Metacarpal Fracture | <ul style="list-style-type: none"> • Direct trauma, crush injuries • Punching (neck and distal shaft of 5th metacarpal common) • Sports related (ball hitting outstretched finger) | <ul style="list-style-type: none"> • Pain, swelling to dorsum of hand • Pain on clenching fist • Deformity • Phalangeal dislocation • Reduced ROM |

References

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