

# GUIDELINES FOR REFERRAL TO FRACTURE CLINIC AND ORTHOPAEDIC TEAM ON CALL

## Overview

What is fracture clinic and how are they different from other clinics?

Fracture clinics are specifically organised to allow us to identify which patients need urgent orthopaedic intervention. This design relies on us being able to see all our new referrals within a week, in clinics that may have forty to fifty patients booked for one morning session. Unlike other outpatient clinics, our main focus is on identifying which patients need urgent surgery or casting and ensuring that these trauma patients have rapid, reliable access back to fracture clinic in the upcoming weeks.

This model of care means that we cannot tackle long term orthopaedic problems such as long term sporting injuries, arthritis or chronic back pain in fracture clinic. Not only do these conditions take a precious appointment away from someone with a new injury, it is also unfair to the patient, who deserves to have their chronic problem discussed in the setting of a dedicated orthopaedic outpatient clinic. This can only be arranged by their GP.

Urgent orthopaedic care does not always mean an operation. Often it is just as important to reassure someone that non operative management is appropriate and to give them the opportunity to ask questions about rehabilitation and recovery from a member of the Orthopaedic team. If you have never worked in fracture clinic, please come down and see how they work- we would be very happy to meet you!

The pro forma for fracture clinic referral requires your (legible) name and grade/ job title OTHERWISE THE REFERRAL WILL NOT BE ACCEPTED, AND YOUR PATIENT WILL NOT BE NOT SEEN IN FRACTURE CLINIC.

## **THE FOLLOWING CONDITIONS SHOULD NOT BE REFERRED TO FRACTURE CLINIC:**

- Toe fractures
- 5<sup>th</sup> metatarsal fractures
- Back pain - *\*Urgent concerns about Spinal trauma, Cauda Equina Syndrome or Spinal Cord Compression must be discussed with the on call Neurosurgical team at St George's Hospital\**
- Traumatic wounds amenable to closure in the ED
- Longstanding, chronic joint problems

## **TIPS FOR DECISION MAKING IN ORTHOPAEDIC INJURIES**

- Post-operative wound problems- please discuss with the Core Trainee/F2 on call- we would prefer arrange for these patients to come back to their consultant's clinic for expert advice and can help arrange this in office hours.
- Always think about the MECHANISM OF INJURY. High energy accidents lead to high energy injuries- these are more commonly unstable injuries requiring intervention.
  - Road traffic collisions
  - Falls from a height, falls while intoxicated
  - Motorcycle and bicycle accidents
- Always think about the FRAILITY OF THE PATIENT AND THEIR SKELETON
  - Is this osteoporotic, fragile bone- missed sacral alar fractures
  - Is this a pathological fracture through bone weakened by cancer
  - Was the fall that caused the fracture a critical sign of acute illness- especially in older patients
- Beware the X Ray that 'DOESN'T LOOK RIGHT' but you can't quite tell why.
  - Is the image technically correct- e.g. a 'true lateral'

## **GUIDELINES FOR REFERRAL TO FRACTURE CLINIC AND ORTHOPAEDIC TEAM ON CALL**

- Is the joint dislocated, especially in the carpus/wrist and foot?
- Ask one of your middle grades/ SpRs first- they have seen a LOT of X Rays!

MAKING A REFERRAL TO THE ORTHOPAEDIC TEAM ON CALL- TIPS FOR NEW F2 DOCTORS.

### INFORMATION YOU WILL NEED

<b>NAME</b>	
<b>AGE + DOB</b>	
<b>GENDER</b>	
<b>OCCUPATION and HAND DOMINANCE</b>	
<b>MECHANISM</b>	
<b>CO-MORBIDITIES and LAST ATE/DRANK</b>	
<b>ALLERGIES and MEDICATIONS</b>	
<b>HOBBIES and USUAL ACTIVITIES- shopping, driving, sports, expectations &amp; concerns</b>	
<b>OPEN/CLOSED FRACTURE</b>	
<b>JOINT INVOLVED- which joint, is it dislocated, is there a fracture dislocation?</b>	
<b>ANGULATION/ DISPLACEMENT</b>	
<b>NEUROLOGICAL DEFICIT</b>	
<b>DISTAL PULSE/ CAPILLARY REFILL</b>	
<b>COMPARTMENT SYNDROME</b>	
<b>DETAILS OF PREVIOUS OPERATIONS- dates, consultant in charge</b>	
<b>WHY ARE YOU WORRIED? You have seen the patient, not us! Try and explain what you are concerned about over the phone.</b>	

X Ray interpretation is pattern recognition and only improves by seeing thousands of images over your career. Just as much important information comes from a good history and careful examination in common with all medical problems.

Always think about the story the patient tells you of how they injured themselves, imagine how it happened and then try and relate that to the imaging and the injury in front of you. At the beginning, be logical and follow your instincts- if you are worried about an orthopaedic problem, especially in children or vulnerable adults who are sick and have trouble communicating, then please call for help.

Your middle grades have seen a lot of orthopaedic pathology and will be experienced in recognising injuries that need referral, don't forget to ask their advice as well!

# GUIDELINES FOR REFERRAL TO FRACTURE CLINIC AND ORTHOPAEDIC TEAM ON CALL

Guidelines for management of fractures in the ED.

'When all else fails, examine the patient...'

## Hands

**Nailbed injuries** - Common crush injuries to the tips of the digits, involving the nail, nailbed, pulp +/- bone. These often look very ugly when they first present and may bleed briskly until dressed. Not all nailbed injuries need operative management. In children, do not throw the tip of finger away unless it is grossly contaminated. Clean the tissue gently and apply as a 'biological dressing', covered with Mepitel, gauze and a light crepe dressing. Large circumferential injuries and those exposing bone or the germinal matrix of the nail should be discussed with Plastics at St George's.

**Mallet injuries** - Closed injuries can be managed in a mallet splint (in extension) and referred to the T&O hand therapy clinic. Bony injuries must be X-Rayed in the splint to ensure that the joint is reduced.

\* In children, beware the Seymour fracture- Salter Harris (I/II) fractures of the distal phalanx physis with avulsion of the proximal nail plate from the eponychial fold. These look like mallet injuries with the distal phalanx held flexed. Look for blood around the nail or a fingernail that looks longer than expected. Seymour fractures must be referred to plastics at St George's.

**Finger fractures** - can be managed with buddy strapping, provided there is no scissoring (overlapping) or rotational deformity. If the whole hand is immobilised- it must be in a safe position to avoid stiffness- rest the hand in the Edinburgh position (intrinsic-plus) in a backslab. Refer to fracture clinic.

**Volar plate injuries** (often seen with a flake of bone on the volar side of the finger) should be rested either by buddy strapping, refer to hand therapy clinic.

**Finger dislocations** - reduce in ED and Re- X ray. Fracture dislocations are complex injuries and often need surgery- discuss with Plastics if urgent concern. Look very carefully at post reduction films- it can be easy to miss persistent subluxation post reduction. Please ask for advice if you are not sure.

**Ulnar collateral injuries of the thumb** - Look for an associated bony avulsion or physeal injury- rest in a thumb spica and refer to fracture clinic. If displaced, refer to the orthopaedic SHO on call.

**Intra-articular fractures at base of thumb** - eponyms include Bennett's and Rolando dependent on fracture configuration- refer to orthopaedic team on call.

**Metacarpal fractures** - examine for rotational deformity/ scissoring of the digit. Rest in Edinburgh position and refer to fracture clinic. Always get a lateral radiograph (AP & Oblique are not enough).

## Carpal bones

Children can fracture the scaphoid (although it is far less common than in adults)- distal radius fractures are more common. Below elbow backslab and refer to fracture clinic.

The distances between the carpal bones change throughout childhood as the ossification centres emerge and can be difficult to interpret- ask for help if you are worried.

# GUIDELINES FOR REFERRAL TO FRACTURE CLINIC AND ORTHOPAEDIC TEAM ON CALL

Adult- Radial sided wrist pain and thumb base/pillar pain following a fall suggests scaphoid fracture until otherwise proven. Place into a futura or below elbow backslab and refer to fracture clinic. Scaphoid fractures are commonly missed and the consequence of this is can be rapid onset of arthritis in the wrist. Displaced fractures of the scaphoid should be placed into a below elbow backslab, discussed with the orthopaedic team on call and brought back to early fracture clinic review.

High energy injuries may result in dislocation of the carpus around the lunate 'perilunate dislocation'- this is an orthopaedic emergency and must be referred urgently to the orthopaedic team on call.

## **Children's Wrist and forearm**

It is possible to reduce and cast some fractures in the ED- avoiding the need for an operation. Please call the orthopaedic team if you think your patient might benefit from an urgent reduction.

Any clinical deformity, radiological angulation, translation or shortening- discuss with Orthopaedic team on call.

- Infants, young children- thick periosteum and excellent remodelling potential. Backslab (above elbow in very small children/ < 3 years), analgesia and refer to fracture clinic.
- Over 8, bigger children and teenagers- These fractures need near anatomical reduction as the potential for remodeling is decreased. If displaced, please ask advice from ED middle grade or discuss with the Orthopaedic team on call. Otherwise backslab, analgesia and refer to fracture clinic.

## **Common fracture patterns in children include:**

- Greenstick fractures- Backslab, analgesia, refer to fracture clinic
- Salter Harris 2 fractures- please do not attempt reduction without discussing with the orthopaedic team. Physeal injuries do not tolerate repeated attempts at reduction and should only be carried out by someone confident in reduction techniques.

## **Adult Wrist**

Radial Styloid- below elbow backslab, broad arm sling, refer to fracture clinic. If displaced or high energy, this can be unstable- please discuss displaced fractures with the Orthopaedic team on call.

- **Distal radius extra-articular**, Distal Radius intra-articular aged over 50/ high functional demand-
  - Important radiological features of instability or poor outcome- Loss of radial height, dorsal tilt or translation (the long axis of the third metacarpal should pass through the long axis of the radius on lateral radiographs), dorsal comminution. Management- analgesia, haematoma block, reduction and below elbow backslab with high arm sling. Re-XR & documented neurovascular examination post reduction.
- **Distal Radius intra-articular** aged under 50/ high functional demand/ volar angulated distal radius fractures/ fracture subluxations-
  - Analgesia and discuss with orthopaedic team if unsure whether to reduce in ED. Most distal radius fractures should be reduced in the ED to relieve pain, relieve pressure on the median nerve and to reduce swelling. Below elbow backslab, high arm sling.

# GUIDELINES FOR REFERRAL TO FRACTURE CLINIC AND ORTHOPAEDIC TEAM ON CALL

Look for Galeazzi fracture- distal 1/3 radius with disruption of distal radio-ulnar joint- requires ORIF.

## Elbow

### Children

Supracondylar fractures- sustained mostly in extension following a fall.

- Undisplaced - may only be visible by 'sail sign'- above elbow back slab and refer to fracture clinic.
- Displaced- discuss with orthopaedic team. Above elbow backslab, thorough vascular and neurological examination of median, AIN, ulnar and radial nerves before and after application. Call for urgent orthopaedic help if you are worried about the vascular supply to the hand.

**Lateral condyle fractures** - can have benign looking XRays that hide very significant intra-articular cartilage injuries— displaced fractures must be referred to orthopaedics. Analgesia, above elbow backslab.

**Medial/Lateral epicondyle fractures** - remember 'CRITOL' order of appearance of ossification centres. Correlate site of pain with any radiological abnormalities- ask ED middle grades for help.

- Undisplaced epicondyle fracture- above elbow backslab, refer to fracture clinic
- Displaced epicondyle fracture- above elbow backslab, discuss with orthopaedic team.

### Adult elbow

Radial head:

- Undisplaced/ raised anterior and posterior fat pads- collar and cuff, fracture clinic review
- Displaced with mechanical block (unable to pronate-supinate)- collar and cuff, orthopaedic referral.

\* Beware Monteggia fracture dislocation- proximal fracture ulna with radial head dislocation- refer orthopaedics

Intra-articular distal humerus fractures- above elbow backslab, broad arm sling, discuss with orthopaedics. Examine radial nerve (Holstein-Lewis)— refer urgently if any neurovascular injury.

### Clavicle and shoulder

**Children** - children's clavicle fractures 'always' heal- often with a palpable lump of fracture callus that disappears over a year-18/12. Broad arm sling, information leaflet.

**Adult clavicle** – broad arm sling/polysling .fracture clinic

Refer to orthopaedic team on call

- open fractures
- floating shoulders
- fractures with associated neurovascular deficit
- tenting of the skin with impending breakthrough of fracture fragments

# GUIDELINES FOR REFERRAL TO FRACTURE CLINIC AND ORTHOPAEDIC TEAM ON CALL

Decision making about fixing clavicle fractures is complex and best done by a senior orthopaedic doctor in fracture clinic. Please refer all other clavicle fractures to fracture clinic and apply a broad arm sling in the interim.

## ACJ injuries

- Grade 1/2- minimally displaced injuries- reassurance and advice. No fracture clinic follow up.
- Grade 3- refer to fracture clinic- surgical treatment is controversial and best discussed with an expert
- Grade 4-(6) refer to fracture clinic, discuss with orthopaedic team on call if any concerns.

## Proximal and diaphyseal humerus

Children's proximal humerus fractures have excellent remodeling potential. Refer to fracture clinic, collar and cuff.

Adult proximal humerus fractures:

- **Greater tuberosity fracture** - collar and cuff, one week fracture clinic follow up, avoiding active shoulder movements in the interim
- **Surgical neck** - collar and cuff, analgesia and re- XR in collar and cuff (aids reduction) if concerned then discuss with orthopaedic team
- **3/4 part, displaced fractures** - discuss with orthopaedic team. Decision making can be complex and best done in fracture clinic. Collar and cuff, documented neurological examination and refer to fracture clinic.

**Adult humeral shaft** - must have documented neurovascular examination. Discuss with orthopaedics re management, dependent on fracture configuration and shape of arm may be amenable to bracing, hanging U slab or collar and cuff.

## Shoulder dislocation

**Anterior** - most common, acutely painful, patient is unable to externally rotate shoulder. Confirm clinical findings with shoulder series XR- AP, axial and scapular 'Y' view. Careful examination and documentation of neurovascular status before and after reduction. Re XR after reduction.

**Posterior** - may be missed on AP XR 'lightbulb sign'. More commonly associated with high energy injury, prolonged fitting and electrocution if bilateral.

Reduce. Check reduction on XR. Broad arm sling/ polysling.

FIRST DISLOCATION- refer to fracture clinic and physio

RECURRENT DISLOCATIONS- please do not refer to fracture clinic- these patients should be seen in a shoulder elective clinic.

## LOWER LIMB

Pelvis and Proximal Femur:

**Fragility fractures:**

## **GUIDELINES FOR REFERRAL TO FRACTURE CLINIC AND ORTHOPAEDIC TEAM ON CALL**

- All elderly patients with hip pain following a fall must have XR Pelvis + lateral hip to exclude a hip fracture. Other common causes of groin and pelvic pain are pubic ramus fractures and sacral insufficiency fractures.
- Management of neck of femur fractures in the elderly- please refer to the #NOF pathway.

### **Pelvic and femoral fractures in young people**

Pelvic fractures in younger patients are high energy injuries often associated with polytrauma. Follow ATLS algorithm and if pelvic fracture is suspected, apply a pelvic binder at the level of the greater trochanters during the primary survey and ensure a PV and PR examination are documented.

Neck of femur fractures in **young** patients must be **promptly** referred to the orthopaedic team on call.

### **Femoral shaft fractures**

May lose significant blood volume into the thigh. Check for compartment syndrome, consider skin traction and refer to orthopaedic team on call.

### **Children's femoral diaphyseal fractures**

Analgesia, backslab for comfort while in ED. Refer to orthopaedics for hip spica/ gallow's traction/ TENS nails as indicated. Always consider NAI in non ambulant children- call for help from paediatric SpR if any concerns.

### **Knee**

- **Dislocation of knee**
  - This is an orthopaedic emergency associated with a high energy mechanism and with high risk of vascular injury. This requires urgent reduction by the orthopaedic team.
- **Dislocation of patella**
  - **First dislocation** - Reduce by gently extending the knee. Immobilise in 30 degrees of flexion in ROM brace or cylinder POP if brace not available. XR to exclude osteochondral defect and refer to fracture clinic.
  - **Recurrent dislocator** - as above, but not for fracture clinic review- GP to refer to elective knee clinic please.
- **Patella fracture**
  - **Displaced fracture**, disrupted extensor mechanism- refer to orthopaedics
  - **Transverse undisplaced fracture**, Manage in cylinder POP or ROM brace in extension (continuously worn 24hr/day), refer to fracture clinic. Any concerns about the integrity of the extensor mechanism- refer to orthopaedic team on call.
  - **Multi fragmentary fracture** - must ensure extensor mechanism is intact and fracture fragments are undisplaced- discuss with orthopaedic team on call if unsure. Than cylinder POP/ braced in extension (continuously worn 24hr/day).

## GUIDELINES FOR REFERRAL TO FRACTURE CLINIC AND ORTHOPAEDIC TEAM ON CALL

- **Beware sleeve avulsion fracture in children** - benign looking XR that looks like a small fracture at inferior pole but is actually a large cartilaginous injury, often requiring ORIF. Refer to orthopaedic team on call if sleeve avulsion identified.
- **Quadriceps and patella tendon rupture** - always examine carefully for quads rupture in the elderly patient with sudden inability to walk with a painful knee. Refer to orthopaedic team on call.
- **Soft tissue knee injuries** - the history of injury and careful examination (not MRI scan acutely) gives important diagnostic information. Obtain XR- AP/lat + skyline to exclude haemarthrosis and OCD
  - Able to weight bear, no haemarthrosis, stable knee- home with advice, no fracture clinic follow up.
  - Unable to weightbear, effusion/haemarthrosis and joint line pain, with convincing mechanism- fracture clinic.
  - Locked knee- *this is the inability to fully extend the knee from a flexed position*- urgent (next 48 hour) fracture clinic and home with strong analgesia +/- small dose of benzodiazepine for spasm.
  - Any knee with major instability and painful haemarthrosis, or very high energy injury discuss with orthopaedics if concerned.

### Tibial fractures

**Toddler's fractures** - common spiral fractures of the tibial diaphysis- initial AK backslab then manage in above knee weight bearing cast (in plaster room in office hours) (it is almost impossible to keep a toddler NWB)

**Cozen's fracture** - children's fracture of the proximal tibial metaphysis that can produce valgus deformity- above knee backslab and needs fracture clinic follow up.

**Adult diaphysial tibial fractures** require admission and close monitoring for compartment syndrome. Obtunded patients may need indwelling anterior compartment monitoring.

**All open fractures of the tibia should be diverted directly to St George's Hospital as part of the trauma network.**

**Follow BOAST 4 guidance (<https://www.boa.ac.uk/wp-content/uploads/2014/12/BOAST-4.pdf>) for first aid before transfer should a patient self-present.**

### Fibula fracture

Direct blow to fibula (lateral side of leg, e.g. bumper of car). Ensure no common peroneal nerve injury and refer to fracture clinic.

Twisting injury +/- ankle pain- must exclude Maisonneuve injury- examine and XR ankle. If medial malleolus fracture/ diastasis/ disruption of mortise, refer to orthopaedic team on call.

### Ankle

Deformed ankle injuries should be reduced urgently in the resuscitation room before taking X Rays, under propofol sedation and a below knee backslab applied. Refer to orthopaedic team after the ankle has been reduced.



## **GUIDELINES FOR REFERRAL TO FRACTURE CLINIC AND ORTHOPAEDIC TEAM ON CALL**

Bimalleolar (2 of medial/lateral/posterior malleolus) fractures, fractures with a large diastasis or disruption of the mortise should be referred to the orthopaedic team on call.

Isolated lateral malleolus fractures at, or below the level of the syndesmosis may be referred to fracture clinic and managed initially in a below knee backslab.

Isolated medial malleolus fractures should be discussed with the orthopaedic team on call (see Maisonneuve).

### **Achilles Tendon Injury**

Most TA ruptures do not require fixation and decision making is best made by a senior orthopaedic doctor in fracture clinic. Achilles tendon rupture is a clinical diagnosis and if identified, all patients need to be placed urgently into an equinus slab and referred to fracture clinic. Missed TA rupture is a potentially devastating injury requiring complex reconstruction. Discuss with ortho reg on call

### **Foot**

Foot injuries require AP, Oblique and lateral XR. The axial or Harris view of the os calcis gives information about malalignment and width of heel fractures.

**Major dislocations of the foot** - e.g. sub-talar, talo-navicular, Chopart joint- are associated with high energy mechanisms of injury and significant swelling and bruising leading to compartment syndrome. Hind and mid foot dislocations require urgent reduction which sometimes needs open techniques in theatre. Refer urgently to orthopaedic team on call.

**Talus fractures** - forced dorsiflexion with axial load. The talus has a tenuous blood supply and displaced talar fractures need prompt reduction. NWB below knee backslab and discuss with orthopaedic team on call.

**Os Calcis/ Calcaneum** - most commonly sustained in a fall from a height. Check the contralateral foot and spine for associated axial skeleton injuries. Discuss all intra-articular injuries with the orthopaedic team on call. Fracture blisters and swelling may require admission for elevation +/- further imaging. Do not apply a backslab until orthopaedic team have reviewed/ are happy for patient to go home.

**Lisfranc injury** - inspect for plantar ecchymosis, observe for swelling. If frank diastasis/fleck of bone seen, discuss with orthopaedic team on call. Weight bearing XR give the most information (if tolerated). NWB suspected Lisfranc injuries and refer to fracture clinic.

**5<sup>th</sup> Metatarsal fractures** can be managed FWB in a supershoe or other stiff soled shoe and do not need fracture clinic referral- info sheet.

Discuss multiple fractures with the orthopaedic team on call. Ensure there is no subluxation by examining the lateral XR.

**Lesser toe fracture dislocations** - re-locate, buddy strap, no referral to fracture clinic.

**Big toe IPJ/ P1 fractures that enter the joint** – buddy strap mobilise in stiff shoe or walking boot. If displaced intra- articular refer to orthopaedic on call