

**Emergency Department – Nelson Hospital**

# Fracture Guidelines

## INTRODUCTION :

Patients with Orthopaedic injuries make up a large part of Emergency work. This document establishes guidelines for the initial management, splintage and follow up arrangements for common fractures and Orthopaedic problems seen in the Emergency Department. They have been developed in consultation with the Department of Orthopaedics and General Practice.

NOTE: In all cases Fracture care must be individualized. Treatment and Follow Up may vary depending on an individual's circumstances or on a particular specialists preference.

## GENERAL PRINCIPLES :

- Most Orthopaedic injuries can be predicted by knowing:
  - the chief complaint
  - the age of the patient
  - the mechanism of injury
- Careful history and physical examination predict X-Ray findings with a high degree of accuracy.
- If a fracture is highly probable clinically despite negative initial X-Rays, the patient should be appropriately splinted and reviewed.
- In general, X-Rays should be taken before (and after) attempted correction of deformity. Exceptions include: neurovascular or skin compromise, significant delay for X-Ray, dislocated knee or ankle, major deformity.
- Neurovascular integrity should be checked and documented before and after all reductions.

### GENERAL PRINCIPLES: (cont'd)

- The primary survey and resuscitation take priority.
- Hypovolaemic shock is the only acute life threatening complication of limb trauma
- Correct initial management reduces the incidence of delayed complications such as sepsis, crush syndrome, compartment syndrome, fat embolism, chronic pain and immobility.
- Patients should receive explicit aftercare instructions before leaving the emergency Department including: monitoring for signs of neurovascular compromise or increasing compartment pressure, cast care, crutch use, weightbearing and follow up arrangements.

### CONVENTIONS :

- All Orthopaedic injuries should be described precisely and according to established conventions.
- Fractures are : OPEN or CLOSED  
: Transverse / Spiral / Oblique / Comminuted  
: displacement and angulation is described in terms of the distal fragments position relative to the proximal fragment

COMMON ABBREVIATIONS :

#	fracture
AE	above elbow
AK	above knee
BAS	broad arm sling
BE	below elbow
CHOP	change of plaster
BK	below knee
FOOSH	fall on outstretched hand
MUA	manipulation under anaesthetic
N/V	neurovascular
ORIF	open reduction internal fixation
POP	plaster of paris
ROP	removal of plaster
SKB	Scott knee brace
NWB	Non weight bearing

## FIRST AID / INITIAL MANAGEMENT :

In all cases:

- 1° survey and resuscitation
- consider medical problems (e.g. cause for fall or collapse)
- control external haemorrhage with pressure/packing/elevation
- reduce fractures or dislocations associated with neurovascular compromise
- clean/irrigate wounds with normal saline and dress
- remove all rings from injured limbs
- apply ice
- position patient (may need to lie down)
- place in appropriate area of ED, e.g. children's room
- apply simple splints, slings, pillows early
- offer analgesia (as per standing orders)  
consider EMLA / Entonox / IV analgesia / regional local anaesthetic blocks
- check tetanus status and give tetanus prophylaxis as per guidelines

## OPEN FRACTURES :

- All open fractures require Orthopaedic consultation (the exception being minor toe and fingertip injuries).
- All require a sterile dressing.
- Most require IV Antibiotics coverage with a 1<sup>st</sup> generation cephalosporin (i.e. Cephazolin). Complex or contaminated wounds should also have gram-ve cover with gentamicin and metronidazole.

## PAEDIATRIC CONSIDERATIONS :

- Non accidental injury (NAI) should be considered in any injured child.
- Children sustain unique patterns of injury and incomplete fractures such as Greenstick, Torus (buckle), Salter Harris (epiphyseal) and bowing fractures.
- Children frequently refer pain from the elbow into the forearm and from the hip into the thigh and knee.
- Reassurance, explanation, play therapy, distraction, EMLA, sedation, entonox, oral analgesia, IV morphine, local anaesthetic techniques and general anaesthesia can and should be used appropriately to allay anxiety and pain in children with Orthopaedic injury.
- Injury prevention e.g. cycle helmets, protective clothing, road safety, seat belt use, reversing care, home safety, alcohol use, supervision and correct sporting technique can all be reinforced in the Emergency Department.

## PLASTER CARE :

- Expert Orthopaedic # Clinic nurses are available daily (Mon-Fri) for advice. They also run regular plaster teaching sessions.
- It is not necessary to split all acute casts providing adequate (written) instructions in plaster care are given. In some circumstances splitting of plaster, (e.g. post # manipulation) is recommended.
- Written plaster care instructions are available.
- Plaster checks at Day 1 are mandatory and can be performed by the patient's practice nurse.

## DURATION OF SPLINTAGE/PLASTER CARE

This will be decided in follow up at the # Clinic and is dependent on numerous factors including age/mobility/complexity of injury etc. As a general guide:

- **Child:** forearm/wrist 3 weeks, tib/fib 4-6 weeks
- **Adult:** forearm/wrist 4-6 weeks, tib/fib 10-16 weeks, ankle 4-6 weeks

## FRACTURE CLINICS :

- Fracture clinics are run by Orthopaedic Surgeons ("Ortho # Clinic") and the Emergency Department ("ED # Clinic").
- As a general rule, anyone with a fracture should be reviewed at approximately 1 week (exceptions include clinically suspected scaphoid #: 14 days and minor buckle #: for ROP in 3 weeks).
- All fractures that are :
  - open
  - significantly comminuted
  - intra articular
  - likely to require further reduction
  - likely to require ORIF
  - rare and unusual

should be seen at an Ortho # Clinic.

- Simple #'s unlikely to require surgery, e.g. clavicle #'s, minor Greenstick #'s can be referred to the Emergency Department # clinic.
- A patient with a fracture requiring Orthopaedic Surgeon follow up should be referred to the on call Orthopaedic Surgeon of the day's next available # clinic in approximately 1 weeks time. If no clinic is available another Surgeon's clinic can be selected.
- The guidelines will denote which problems should be seen initially :
  - 1. by an Orthopaedic Surgeon at an Ortho # Clinic.
  - 2. at any # Clinic (including the Emergency Department clinic).
  - 3. at the ED # Clinic.
  - 4. by the GP.

## NOTE:

Recurrent and some selected problems, e.g. recurrent shoulder dislocations, Recurrent patella dislocations, rotator cuff tears, low back pain, minor knee injuries should be referred back to the GP and considered for referral to private Orthopaedic clinics under ACC.

### X-RAY FOLLOW UP :

A four tiered backup system is in place to prevent missed fractures.

1. House surgeons are encouraged to review all films with the ED SMO
2. Unusual or subtle injuries are brought to the attention of the senior ED Doctor on duty by the reporting Radiologist.
3. X-Ray reports are reviewed daily in the Emergency Department and discrepancies between reports and clinical notes are addressed immediately. Patients may be recalled or sent clinic appointments.
4. A copy of X-Ray reports (and the ED record) are sent to the patient's GP.

Intermittent audit of the system is conducted.

### ORGANISING A # CLINIC APPOINTMENT :

- Give the Receptionist a patient label.
- Write on the label:
  - the injury, e.g. Colles # R/Wrist
  - which Clinic required, e.g. Ortho # Clinic
  - when follow up required, e.g. 1 week
- NOTE: GPs can phone (Ortho secretary during office hours. ED reception after hours.) and request # Clinic appointments for community patients requiring # follow up.

INJURY	TREATMENT	FOLLOW UP
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SHOULDER GIRDLE :		
<u>Greenstick # Clavicle</u>	BAS (1-2 weeks)	GP 1 week Early ROM
<u># Clavicle</u> (Pleural, Brachial Plexus, Axillary Vessel injury rare)	BAS (1-2 weeks)	GP 1 week Early ROM <u>Ortho # Clinic 1 week</u> :if lateral 1/3, severe comminution or displacement >1cm.
<u>Sternoclavicular Dislocation</u> (High energy injury) (Posterior = Ortho emergency)	BAS Consider CT	Urgent Ortho consult
<u>AC Joint Injury</u>	BAS (1-2 weeks)	<u>Grade I, II:</u> GP 1 week <u>Grade III:</u> Ortho # Clinic 1 week
<u># Scapula</u> (High incidence of associated injuries)	BAS	Ortho # Clinic 1 week
<u># Proximal Humerus</u>	Collar & Cuff Or BAS if undisplaced	<u>Minimal or no displacement or angulation: # Clinic 1 week</u> <u>Displaced, angulated, III or IV part: Ortho consult</u>
<u># Proximal Humeral Epiphysis</u>	BAS	Ortho # Clinic 1 week Ortho consult if displaced

INJURY	TREATMENT	FOLLOW UP
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SHOULDER GIRDLE : continued		
<u>Anterior Shoulder Dislocation</u>	Reduction BAS (2-3 weeks)	<u>Uncomplicated:</u> GP 1 week Physio  <u>Complicated:</u> Hill Sachs (compression # humeral head) Bankhart (#glenoid rim) Ortho # Clinic 1 week  <u>Recurrent:</u> GP referral to private Orthopaedic clinic under ACC
<u>Posterior Shoulder Dislocation</u> (associated with major trauma, seizure, electrocution)	Reduction BAS	Ortho consult
<u>Rotator Cuff Tear</u>	BAS (1-2 weeks)	GP 1 week Outpatient USS Physio (Ortho referral for large tears, young patients, persistent pain & weakness)
<u>Ruptured Biceps Tendon</u>	BAS	<u>Proximal:</u> Ortho # Clinic 1 week (young patients)  <u>Distal:</u> Ortho Consult

INJURY	TREATMENT	FOLLOW UP
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**SHOULDER GIRDLE : continued**

<p><u>Calcific Tendonitis :</u></p> <ul style="list-style-type: none"> <li>▪ Silent</li> <li>▪ Subacute (painful arc)</li> <li>▪ Acute phase</li> </ul>	<ul style="list-style-type: none"> <li>▪ ----</li> <li>▪ NSAID</li> <li>▪ NSAID/Analgesia 48hrs. BAS (consider LA/Steroid injection. USS guided aspiration. Physio)</li> </ul>	<ul style="list-style-type: none"> <li>▪ ----</li> <li>▪ GP 1 week</li> <li>▪ GP PRN</li> </ul>
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**ELBOW :**

<p><u>Humeral Shaft #</u></p> <ul style="list-style-type: none"> <li>▪ Minimally Displaced</li> <li>▪ Significantly Displaced Proximal #</li> </ul> <p>(radial nerve injury in 20%)</p>	<ul style="list-style-type: none"> <li>▪ U Slab</li> </ul> <p>Consider Hanging Cast D/W orthopod</p>	<ul style="list-style-type: none"> <li>▪ Ortho # Clinic 1 week</li> <li>▪ Ortho # Clinic 1 week</li> </ul>
<p><u>Supracondylar #</u> (Common childhood #) (Extension injury In 98%)  (10% transient loss of brachial pulse = Orthopaedic emergency)  (7% neuropraxia)</p>	<ul style="list-style-type: none"> <li>▪ <u>Type I</u>: (minimal or no displacement) - Collar &amp; Cuff + Backslab - Elbow at 90-100° Flexion</li> <li>▪ <u>Type II or III</u>: (displaced) - Splint in position of comfort Do <u>not</u> try to reduce in ED.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ortho # Clinic 1 week</li> <li>▪ Urgent Ortho consult</li> </ul>

INJURY	TREATMENT	FOLLOW UP
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ELBOW : continued		
<u>Transcondylar / Intercondylar #</u>	AE POP BAS	Ortho Consult
<u>Condylar #</u>	AE POP BAS	Ortho Consult
<u>Epicondylar #</u>	AE POP BAS	Ortho Consult
<u>Olecranon #</u>	AE POP BAS	Ortho Consult
<u>Radial Head &amp; Neck #</u>	Collar & Cuff Or BAS if very painfull Early ROM (consider aspiration)	<u>Minimally displaced:</u> ED # Clinic 1 week  <u>Comminuted/Displaced</u> <u>&gt;2mm:</u> Ortho # Clinic 1 week
<u>Elbow Dislocation</u> (Brachial artery injury in 8%)	Reduce AE Backslab BAS	Ortho # Clinic 1 week
<u>Pulled Elbow</u> (Common injury in children aged 1-4) (Recurrence in 20%)	X-Ray not required Reduce (supination + flexion of forearm with pressure over radial head) 90% regain mvt in 30 mins BAS	GP follow up PRN  Review if function not returned within 24 hours

INJURY	TREATMENT	FOLLOW UP
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**ELBOW : continued**

<u>Olecranon Bursitis</u> (Post traumatic, inflammatory, infective)	<u>Consider:</u> - Aspiration (MC + S) - NSAID if inflammatory - Antibiotic if infective - Backslab - BAS (1 week)	GP
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**FOREARM :**

<u># Shaft Radius &amp; Ulna (Adult)</u> <ul style="list-style-type: none"> <li>▪ Undisplaced</li> <li>▪ Displaced/Angulated</li> </ul>	<ul style="list-style-type: none"> <li>▪ AEPOP</li> <li>▪ AE Backslab</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ortho # Clinic 1 week</li> <li>▪ Ortho Consult</li> </ul>
<u>Isolated Ulna Shaft # (Nightstick #)</u>	AEPOP	Ortho Clinic 1 week
<u>Monteggia #</u> (# Prox ulna & dislocated radial head) (Radial nerve injury in 17%)	AE Backslab	Ortho Consult
<u>Galeazzi #</u> (# Radius and subluxation/dislocation of interior radio/ulna joint)	AE Backslab	Ortho Consult

INJURY	TREATMENT	FOLLOW UP
<b>FOREARM : continued</b>		
<p><b># Radius &amp; Ulna (Child)</b></p> <ul style="list-style-type: none"> <li>▪ Greenstick with &lt; 10° angulation</li> <li>▪ Significant angulation or displacement</li> <li>▪ Plastic deformation (bowing deformity)</li> </ul>	<ul style="list-style-type: none"> <li>▪ AEPOP</li> <li>▪ - Reduction procedural sedation or GA -AE Backslab</li> <li>▪ AE Backslab</li> </ul>	<ul style="list-style-type: none"> <li>• # Clinic 1 week</li> <li>▪ Ortho consult</li> <li>▪ Ortho consult</li> </ul>
<b>WRIST :</b>		
<p><b><u>Scaphoid #</u></b></p> <p>(80% waist 3% AVN 5% non union)</p>	<p><b><u>Scaphoid Views :</u></b></p> <ul style="list-style-type: none"> <li>▪ <b><u>Visible #:</u></b> scaphoid POP</li> <li>▪ <b><u>No visible # on initial film:</u></b> wrist splint (or scaphoid POP)</li> <li>▪ <b><u>No # at 14/7:</u></b> +asymptomatic</li> <li>▪ <b><u>No # at 14/7 but persisting pain/tenderness</u></b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Ortho # Clinic 1 week</li> <li>▪ # Clinic 14/7 ROP and repeat scaphoid views</li> <li>▪ Mobilize</li> <li>▪ Ortho consult (Consider CT)</li> </ul>
<p><b><u>Lunate #</u></b></p>	<p>BEPOP</p>	<p>Ortho # Clinic 1 week</p>

INJURY	TREATMENT	FOLLOW UP
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WRIST : continued		
<p><u>Triquetral #</u></p> <p>(Dorsal chip # on lateral view common)</p>	BEPOP or wrist splint	ED # Clinic 1 week
<p><u>Pisiform #</u></p> <p>(associated with ulna nerve compression)</p>	BEPOP or wrist splint	Ortho # Clinic 1 week
<p><u>Scapholunate Ligament Disruption</u></p> <p>('Terry Thomas sign' = widening of scapholunate joint;</p> <p>'Signet Ring sign' = scaphoid rotation)</p> <p>Check Median Nerve</p>	Attempt closed Reduction BEPOP	Ortho consult
<p><u>Perilunate Dislocation</u></p> <p>(Lunate remains in position, Capitate +/- Triquetrum dislocates dorsally)</p> <p>Check Median Nerve</p>	Attempt closed Reduction BEPOP	Ortho consult
<p><u>Lunate Dislocation</u></p> <p>("Piece of Pie" triangular appearance of lunate on AP;</p> <p>"Spilled Teacup" on lateral)</p> <p>Check Median Nerve</p>	Attempt closed Reduction BEPOP	Ortho consult

INJURY	TREATMENT	FOLLOW UP
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WRIST : continued		
<p><u>Colles #</u></p> <p>(Transverse # of Distal Radial Metaphysis within 2cm of joint. Usually dorsally displaced and angulated. Often associated with Ulna Styloid #. Maybe intra articular.</p>	<p><u>Reduction required if :</u></p> <ul style="list-style-type: none"> <li>▪ Visible deformity</li> <li>▪ Loss volar tilt of distal radial articular surface beyond neutral.</li> <li>▪ Ulnar Styloid displaced.</li> </ul> <p><u>Options :</u></p> <ol style="list-style-type: none"> <li>1. Biers Block</li> <li>2. Haematoma Block</li> <li>3. Axillary arm block</li> <li>4. Analgesia and sedation</li> <li>5. GA in OT</li> </ol> <p>“Colles type” BEPOP</p>	<p><u>Undisplaced/Very Elderly:</u> ED # Clinic 1/52 <u>All others</u> Ortho # Clinic 1/52 Ortho consult if reduction unsatisfactory</p>
<p><u>Smiths #</u></p> <p>(“Reverse Colles”)</p>	<p>Reduction</p> <p>AEPOP with wrist in supination and slight dorsiflexion</p>	<p>Ortho # Clinic 1 week</p>
<p><u>Bartons #</u></p> <p>(Oblique intra articular # of rim of distal radius – dorsal or volar)</p>	<p>Reduction BEPOP</p>	<p>Ortho consult</p>
<p><u>Radial Styloid #</u></p> <p>(Chauffeurs or Hutchinsons #)</p>	<p>BEPOP</p>	<p># Clinic 1 week</p>

INJURY	TREATMENT	FOLLOW UP
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**WRIST : continued**

<u>Torus # Distal Radius</u> (Buckle #)	1.BEPOP or 2.back slab or 3.wrist splint if size available	ED # Clinic if in a full cast or with GP if in a slab or splint. ROP 3 weeks
<u>Greenstick # Distal Radius</u>	Reduction if >10° angulation  BEPOP with moulding	# Clinic 1/52 with Re X-Ray in plaster
<u>Child with Clinical #</u> (radiologically occult)	BEPOP	# Clinic 1 weeks
<u>Displaced Salter Harris #</u>	Reduction, usually under GA (or regional/LA/sedation in ED in selected cases). BEPOP	# Clinic 1 week

**HAND :**

<u>Distal Phalangeal Tuft #</u> (displaced or intra articular)	Soft Tissue Management (Consider hairpin or mallet splint for initial protection)	GP 1 week  Ortho consult if complex STI
<u>Distal Phalangeal Base #</u>	Soft tissue Management (Consider hairpin or mallet splint for initial protection)	Ortho # Clinic 1 week
<u>Mallet Finger</u>	X-Ray (maybe Avulsion #)  Mallet splint	Ortho # Clinic 1 week

INJURY	TREATMENT	FOLLOW UP
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HAND : continued		
<u>Proximal &amp; middle Phalangeal #</u>	<u>Undisplaced/Stable</u> : buddy strap  <u>Displaced/Unstable</u> : reduce, volar gutter splint ("cobra" position, MCP Flexed/IPJ extended)	GP 1 week  Ortho # Clinic 1 week and re X-Ray
<u>Metacarpal Head #'s II - V</u>	Volar slab ("cobra" position)	Ortho # Clinic 1 week
<u>'Fight Bite'</u>  (clenched fist vs mouth injury, wound over MCPJ +/- MC head #)	Sterile dressing Volar slab ("cobra" position) IV Cephalosporin or Augmentin	Ortho consult (admission for operative exploration, debridement, IV Antibiotics)
<u>Metacarpal Neck #</u>  <ul style="list-style-type: none"> <li>▪ 2<sup>nd</sup> and 3<sup>rd</sup></li> <li>▪ 4<sup>th</sup> and 5<sup>th</sup></li> </ul>	<ul style="list-style-type: none"> <li>▪ &lt;15° angulation acceptable. Volar slab or radial gutter splint.</li> <li>▪ <u>Undisplaced</u>: buddy strap and mobilise. Or splint in volar slab if very swollen and painful</li> <li>▪ <u>Rotated/Angulated &gt;40°/ Displaced/Extensor lag &gt;30°</u> reduction under Metacarpal block (90:90 method) Volar slab or ulna gutter splint</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ortho # Clinic 1 week</li> <li>▪ GP follow up 1 week</li> <li>▪ Ortho # Clinic 1 week</li> </ul>

INJURY	TREATMENT	FOLLOW UP
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HAND : continued		
<u>Metacarpal Shaft #</u> <ul style="list-style-type: none"> <li>▪ 2<sup>nd</sup> and 3<sup>rd</sup></li> <li>▪ 4<sup>th</sup> and 5<sup>th</sup></li> </ul>	<ul style="list-style-type: none"> <li>▪ - Anatomical reduction required. - Volar slab</li> <li>▪ &gt;10-20° angulation reduce under MC block Volar slab (or ulna Gutter splint)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ortho consult</li> <li>▪ Ortho # Clinic 1 week</li> </ul>
<u>Metacarpal Base #</u>	Padded crepe and mobilize or Volar slab	# Clinic 1 week  (Displaced: Ortho consult)
# <u>Base Thumb Metacarpal</u>	Reduce if >20° angulation Bennett's cast  (thumb in abduction with IPJ extended)	# Clinic 1 week
<u>Bennetts #</u>  (intra articular # base of thumb MC with subluxation of CMCJ)	Consider reduction under median & radial nerve block. Bennett's cast.	Ortho consult
<u>Rolando #</u>  (intra articular comminuted # base of thumb metacarpal)	Bennett's cast	Ortho consult
<u>Paediatric Hand #s</u>  (often Greenstick or Salter Harris #'s)	Closed reduction Simple splints or Volar slab	# Clinic 1 week

INJURY	TREATMENT	FOLLOW UP
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HAND : continued		
<u>DIPJ Dislocation</u>	Digital N Block Reduce Wound management Splint (Volar or Hairpin)	GP or # Clinic 1 week
<u>PIPJ Dislocation</u>	Digital N Block Reduce Wound management Gutter splint	GP or # Clinic 1 week
<u>Bouttonniere Deformity</u> (Injury to central slip of extensor)  (have high index of suspicion)	Splint PIPJ (only) in extension with boutonniere splint	Ortho # Clinic 1 week
<u>MCPJ Dislocation</u>	MC block Reduction Flex wrist & reduce with dorsal pressure (avoid traction extension to prevent Volar plate interposition) Volar slab	Ortho # Clinic 1 week
<u>CMCJ Dislocation</u>	Reduction BEPOP	Ortho # Clinic 1 week
<u>Thumb IPJ Dislocation</u>	Reduction under median/radial N block.  Cast/Splint in mild flexion .	# Clinic 1 week

INJURY	TREATMENT	FOLLOW UP
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HAND : continued		
<u>Thumb MCPJ Dislocation</u> (common, most dorsal)	Closed reduction under median/radial N block. (May need to flex IPJ/MCP and wrist to relax FPL).  Test collateral ligaments.  'Thumb spika' cast (thumb MP in 20° Flexion)	# Clinic 1 week  Ortho consult if irreducible
<u>Ulna Collateral Ligament Injury</u> ("skiers/gamekeepers" thumb)	X-Ray (may be associated Avulsion #)  <ul style="list-style-type: none"> <li>▪ <u>Partial</u>: - Thumb spika cast or strapping</li> <li>▪ <u>Complete</u>: - Surgical repair</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ortho # Clinic 1 week</li> <li>▪ Ortho consult</li> </ul>

HIP :		
# <u>NOF</u>	Medical assessment Analgesia Femoral N Block O <sup>2</sup> /IV Fluids/NOF pathway	Ortho Admission
<u>High Probability # NOF</u> (no # on initial X-Ray)	Consider early CT/MRI	Ortho Admission
<u>Pubic Rami #</u>	Analgesia.	Mobile → home Non Mobile → admit Ortho → or high level Nursing home Consider Medical/ATR consult if complex medical problems.

INJURY	TREATMENT	FOLLOW UP
<b>HIP : continued</b>		
<p><u>Hip Dislocation</u> (consider associated injuries)</p> <ul style="list-style-type: none"> <li>▪ <u>Posterior (90%)</u> (often high energy trauma associated with sciatic N compression)</li> <li>▪ <u>Anterior (10%)</u> (associated with Femoral neurovascular injury)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Urgent reduction under sedation or GA</li> <li>▪ Reduction under GA</li> </ul>	<ul style="list-style-type: none"> <li>▪ Urgent Ortho consult</li> <li>▪ Urgent Ortho consult</li> </ul>
<p><u>Dislocated Total Hip Replacement Prothesis</u></p>	<p>Attempt reduction under analgesia and sedation in appropriately selected patients; otherwise GA</p>	<p>Ortho consult</p>
<p><u>Hip Pain in Children</u>  (consider septic arthritis/perthes/SUFE/transient synovitis)</p>	<p>AP pelvis and Frog leg views. Other investigations and management depending on clinical scenario. (EMLA/FBC/CRP useful)</p>	<p>Ortho consult</p>

<b>FEMUR :</b>		
<p><u>Femoral Shaft #</u></p>	<p>Analgesia Fluid resuscitation X-match Femoral N Block Correct deformity Femoral traction splint</p>	<p>Ortho consult</p>

INJURY	TREATMENT	FOLLOW UP
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KNEE :		
<u>Distal Femur #</u>	Long leg Backslab	Ortho consult
<u>Tibial Plateau #</u>	Long leg POP	Ortho consult
<u>Segond #</u> (bony avulsion of lateral tibial plateau associated with ACL disruption)	SKB	Ortho # Clinic 1 week
<u>Tibial Spine #</u> (intercondylar eminence)	SKB	Ortho consult
<u>Quadriceps Tendon Rupture</u>	SKB	Ortho consult
<u>Patellar Ligament Rupture</u>	SKB	Ortho consult
<u>Patella #</u> (80% transverse)  (consider associated hip injury in RTC)  (bi + multipartite patella common, ossification centre(s) in upper outer quadrant with smooth cortical margin)	AP lateral and Skyline views  Undisplaced: SKB Crutches  Displaced >3mm	Ortho # Clinic 1 week  Ortho consult (tension band wiring)

INJURY	TREATMENT	FOLLOW UP
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**KNEE : continued**

<u>Patella Dislocation</u> (recurrent 15%) (associated with osteochondral #)	Closed reduction (Extend Knee) (procedural sedation) AP/lateral/Skyline views SKB (1-2 weeks) Crutches Physio	GP follow up 1 week (Ortho referral if associated # or recurrence)
<u>Knee Joint Dislocation</u> (limb threatening emergency, high association with vascular injury)	Urgent reduction Long leg backslab with knee in 20° Flexion Consider CT Angiography	Urgent Orthopaedic and consider Vascular consult
<u>Knee Ligament Injuries</u>	<u>Minor:</u> - Crepe/Tubigrip - RICE 48 hours → Mobilise  <u>Moderate/Major:</u> - SKB/Crutches	GP Follow up 1 week Physio  (Ortho consult if major instability/combination injury/significant lateral inj)
<u>Meniscal Injury</u>	Tubigrip/SKB/Crutches	GP Follow up 1 week

**TIB FIB :**

<u>Tibial Tuberosity #</u>	Long leg POP	Ortho consult
<u>Toddler's #</u> (subtle nondisplaced spiral # of Distal Tibia, 9mths – 3yrs)	AKPOP (knee in 10-20° Flexion)	# Clinic 1 week

INJURY	TREATMENT	FOLLOW UP
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TIB FIB : continued		
<p><u>Tibial Shaft #</u> (high association with compartment syndrome)</p>	<p>Long leg Backslab Knee 10-20° Flexion (consider full POP if child with low energy injury)</p>	<p>Ortho Consult</p>
<p><u>Isolated Fibula Shaft #</u> (direct blow)  (associated with common Peroneal N. injury)  (Exclude ankle injury)</p>	<p>Padded Crepe / Crutches NWB</p>	<p>Ortho # Clinic 1 week</p>

INJURY	TREATMENT	FOLLOW UP
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ANKLE :

### OTTAWA ANKLE RULES

In the context of trauma:

Ankle views are required if there is pain in the Malleolar region and any of the following:

1. Inability to weight bear for 4 steps immediately or in the ED.
2. Bone tenderness at the posterior edge of the Distal 6cm or tip of the Lateral or Medial Malleolus.

Foot views are required if there is pain in the mid foot region and any of the following :

1. Inability to weight bear for 4 steps immediately or in the ED.
2. Bone tenderness at the Navicular.
3. Bone tenderness at the base of the 5<sup>th</sup> Metatarsal.

OAR : do not apply for chronic injuries;  
: are under evaluation in children

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INJURY	TREATMENT	FOLLOW UP
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ANKLE : continued

ANKLE FRACTURES REQUIRING ORTHOPAEDIC CONSULTATION IN THE ED

All Open #'s

All Pilon #'s

All Bimalleolar #'s

All Trimalleolar #'s

All Intra Articular #'s with step deformity

Unimalleolar #'s :

- displaced Medial Malleolus
- Medial Malleolar # with lateral ligament rupture
- displaced lateral Malleolar #
- lateral Malleolar # with widened medial clear space
- Unimalleolar # with Syndesmotic Diastasis
- Fibula # at or Proximal to the Tibiotolar joint (B or C)
- displaced Posterior Malleolar #
- posterior Malleolar # involving >25% of joint surface

\* Correct deformity where possible and apply BKPOP.

INJURY	TREATMENT	FOLLOW UP
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ANKLE : continued		
<u>Isolated Weber Type A</u> # Lateral Malleolus  (below the Tibiotalar joint line)	Moonboot or BKPOP Crutches	# Clinic 1 week
<u>Maisonneuve #</u>  (oblique # of Proximal Fibular in association with Medial Malleolar # or Deltoid ligament rupture)	BKPOP	Ortho consult
<u>Minor Avulsion # Lateral Maleolar tip</u>	Treat as sprain	----
<u>Ankle Sprain</u>	RICE 48 hours. Early mobilization. Crutches for initial use if severe (depending on availability).	GP 1 week Physio
<u>Ankle Dislocation</u>	<u>No</u> pre reduction X-Ray required. Reduce ASAP (pick up by great toe) BKPOP	Ortho consult
<u>Achilles Tendon Rupture</u>	Full equines BKPOP Crutches	Ortho # Clinic 2 weeks
<u>Peroneal Tendon Dislocation</u>	Crepe and Crutches	Ortho # Clinic 1 week

INJURY	TREATMENT	FOLLOW UP
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FOOT :		
<u>Talar Dome #</u>	BKPOP	Ortho consult
<u>Minor Talar Lateral Process Avulsion #</u>	BKPOP	Ortho # Clinic 1 week
<u>Talar #</u> (Head, neck, body)	Reduce BKPOP	Ortho consult
<u>Subtalar Dislocation</u>	Attempt reduction BKPOP	Ortho consult
<u>Calcaneal #</u>  (7% bilateral 25% other lower limb injuries 10% vertebral compression #)  (Boehlars angle < 20° suggests compression # of Calcaneus)	RICE Crutches (NWB)	Ortho consult
<u>Navicular #</u>  (risk of AVN)	BKPOP Crutches	Ortho # Clinic 1 week
<u>Cuboid &amp; Cuneiform #</u>	BKPOP	Ortho # Clinic 1 week
<u>Lisfranc Injury</u>  (# / dislocation of Tarsometatarsal joint(s))	BK Backslab	Ortho consult

INJURY	TREATMENT	FOLLOW UP
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FOOT : continued		
<u>Metatarsal #</u> <ul style="list-style-type: none"> <li>▪ 2<sup>nd</sup> – 5<sup>th</sup> undisplaced</li> <li>▪ 1<sup>st</sup></li> <li>▪ Displaced</li> </ul>	<ul style="list-style-type: none"> <li>▪ BKPOP (walking) or Moonboot</li> <li>▪ BKPOP NWB</li> <li>▪ BKPOP NWB</li> </ul>	<ul style="list-style-type: none"> <li>▪ GP or # Clinic 1 week</li> <li>▪ Ortho # Clinic 1 week</li> <li>▪ Ortho consult</li> </ul>
# <u>Base 5<sup>th</sup> Metatarsal</u>	Moonboot and Crutches or Crepe and Crutches	GP or # Clinic 1 week
<u>Jones #</u> (at least 15mm Distal to the Proximal end of the 5 <sup>th</sup> Metatarsal)	BKPOP NWB Crutches	Ortho # Clinic 1 week
<u>Phalangeal #</u>	Reduce to satisfactory clinical appearance.  Buddy strap	GP follow up 1 week
<u>Hallux #</u>	<u>Undisplaced:</u> Buddy strap (may need walking BKPOP)  <u>Displaced:</u> Reduce  <u>Unstable / Irreducible:</u> ORIF	# Clinic 1 week  # Clinic 1 week  Ortho consult

INJURY	TREATMENT	FOLLOW UP
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FOOT : continued		
<u>Sesamoid #</u>	Moonboot Crutches	# Clinic 1 week
<u>MTP Dislocation</u>	Reduce Buddystrap  1 <sup>st</sup> – BKPOP with toe extension	GP follow up 1 week  Ortho # Clinic 1 week
<u>IPJ Dislocation</u>  (2 <sup>nd</sup> – 5 <sup>th</sup> toes)	Reduce Buddystrap	GP follow up 1 week
<u>IPJ Dislocation</u>  (Great toe)	Reduce  Moonboot	# Clinic 1 week

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