

Wrist and scaphoid fractures

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Background

- Usually occur from a fall on to an outstretched hand (FOOSH)
- Very common area for children to injure. Child-specific injuries including buckle and greenstick fractures occur due to relative strength and elasticity of periosteum.
- Scaphoid fractures are the exception being rare below 10 years and account for only 0.3-0.5% of paediatric fractures. Peak age is 12-17 years.

The proximal pole of the scaphoid relies on the distal pole for blood supply. If fracture is missed, potential complications include avascular necrosis and non-union with early onset arthritis.

Have a high index of suspicion if clinical findings fit a scaphoid injury.

Types of fracture covered in this guideline:

1. **Buckle and greenstick** fractures
2. **Scaphoid** fractures
3. **Distal forearm** fractures including the **manipulation under 70% nitrous oxide guideline**

Buckle and greenstick fractures

- Buckling of the cortex of the distal metaphysis due to compression failure
- Buckle fractures are inherently **stable** but painful.
- Usually tender. Swelling and restriction of movement may be minimal
- Greenstick fractures occur when the cortex on one surface breaches. Less stable, with a higher tendency to displace. Can be significantly angulated.

X-rays

Buckle fracture distal radius and ulna



On **AP view** – fracture appears as a bulbous swelling of the cortex of the ulna, radius, or both. May not be visible on AP view.

On **lateral view** – fracture appears as a bump on one cortex (may be dorsal or volar).

Greenstick fracture distal radius



On **AP view** – fracture may mimic buckle fracture

On **lateral view** – fracture appears as a cortical break on one surface with an intact cortex on the other (may be dorsal or volar).

There may be angulation with the intact cortex acting as a hinge.

Management

Apply a **Futura splint** for 3 weeks with no follow up, providing the fracture is:

- Single cortex only i.e. not a greenstick (on lateral view)
- Not angulated (check with senior Clinician if not sure)

If not, **apply Futura splint** and follow up in virtual fracture clinic.

Provide **parent information leaflet** and safety-net for when to return – usually if no improvement within 2 weeks of injury.

Scaphoid fractures

- Easily missed on x-ray. Acting on clinical suspicion is crucial.
- Always look at scaphoid bone and other carpals on wrist x-rays in older children.

Assessment

Look for clinical signs of scaphoid fracture:

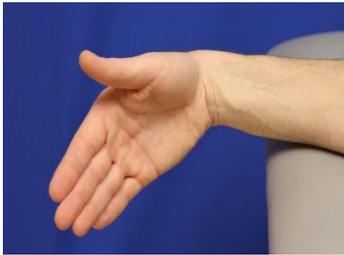
Anatomical snuff box (ASB) tenderness



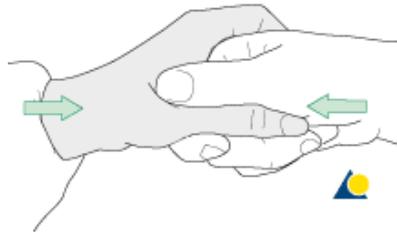
Tenderness over scaphoid tubercle



Pain on ulnar deviation



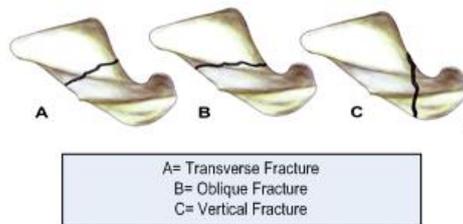
Pain on axial compression – telescoping of thumb



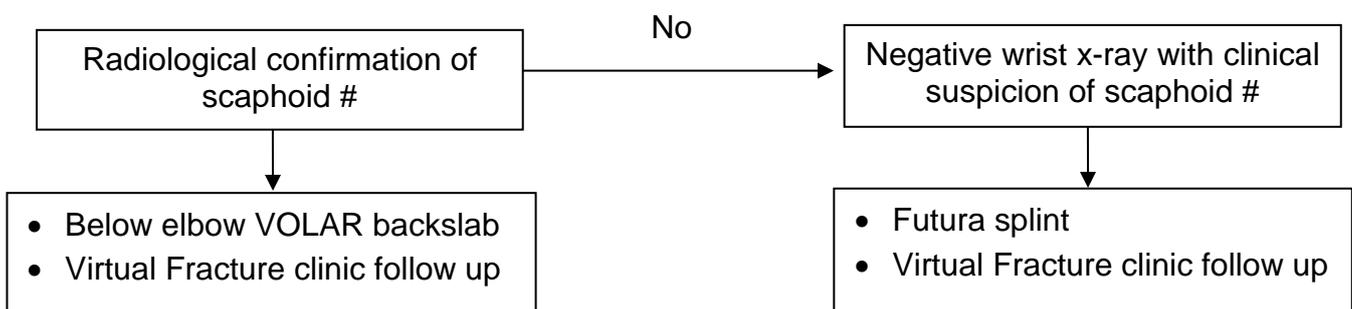
X-rays

Request **wrist x-rays** in the first instance unless high index of suspicion.

- Scaphoid views alone can result in the much commoner radial fracture being missed



Management



Distal forearm fractures

- Usually greenstick fractures (incomplete) with intact periosteal hinge or Salter-Harris type 2 injuries but can be any including:
 - SH Types I – V
 - Metaphyseal complete fractures – single or both bones
 - Diaphyseal fractures – single or both bones

- Usually occur in the distal third of the forearm
- Have high likelihood of remodelling without intervention, particularly in the younger age group.

Always look out for two fracture types:

1. Monteggia fracture: Ulnar shaft fracture with **dislocation of the radiocapitellar joint**.
2. Galeazzi fracture: Distal third radius fracture with **dislocation of the distal radioulnar joint**.

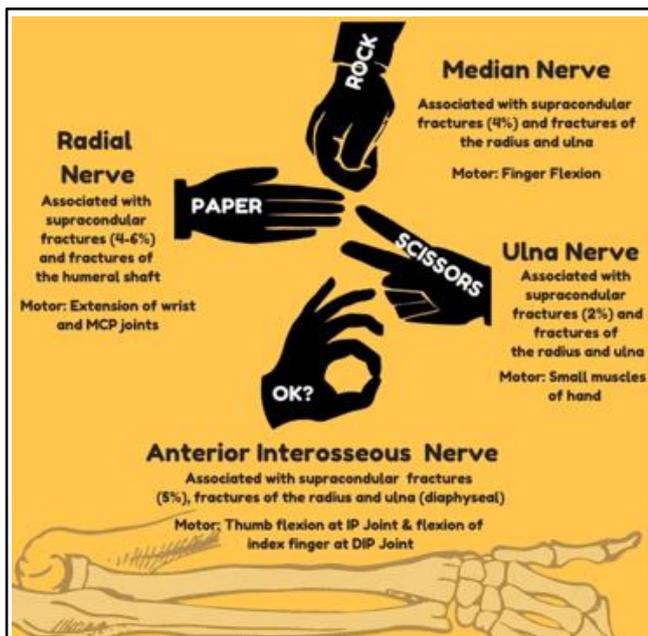
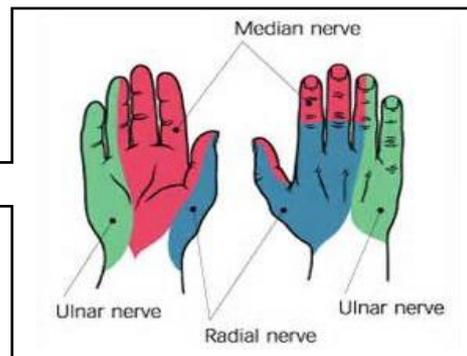
If either is missed, irreversible chronic joint problems may occur.

Assessment

Always examine the joint above (elbow) and below (wrist).

Check distal neurovascular function

Test that sensation is intact for each of the three nerves.



Test the motor function of the three nerves using the **'Rock, Paper, Scissors, OK' game**:

Ensure the child can fully extend and flex all five digits and that thumb opposition is intact.

X-rays

Request forearm views to include the elbow and wrist.

Management

1. If **undisplaced simple** radius and/or ulna fracture:

- Put in above elbow backslab
- Follow up in virtual fracture clinic
- Plaster and VFC leaflet

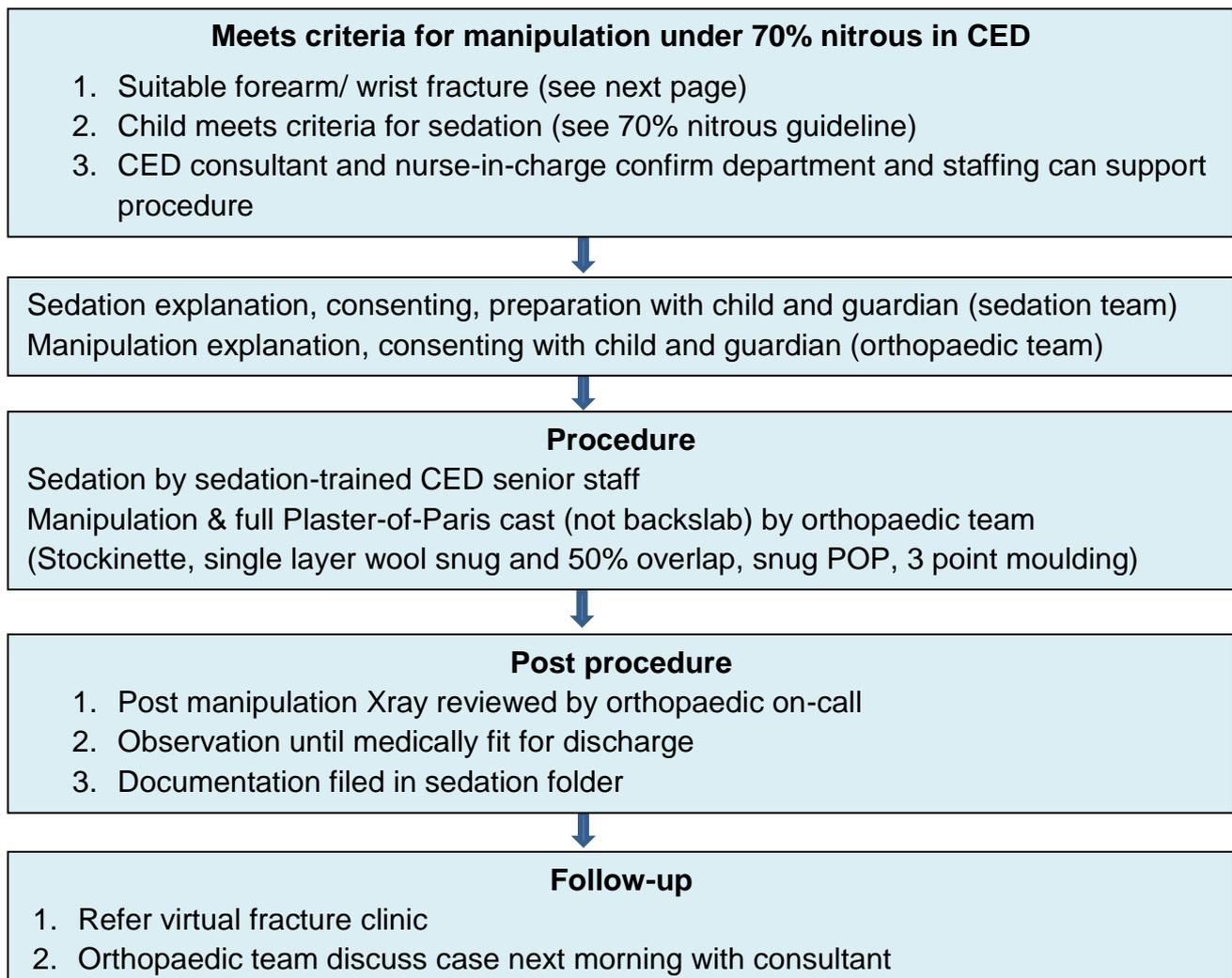
2. If **displaced or complex** fracture:

- Keep nil by mouth
- Put in above elbow backslab for comfort if any delay or requirement for transfer e.g. patient at PRH ED
- Refer Orthopaedic Registrar Bleep 8629

Child may be suitable for manipulation in the CED under 70% nitrous oxide sedation.

If not suitable for manipulation under 70% nitrous, Orthopaedic team will arrange for MUA at a later time, depending on age of child / degree of deformity or angulation.

Manipulation under 70% nitrous oxide pathway



Criteria for forearm and wrist fractures suitable for 70% nitrous manipulation:

- Closed **greenstick fractures** and **Salter-Harris II** wrist fractures.
- Intact periosteal hinge on the concave side of fracture
- Any degree of angulation can be considered
- Any location of a forearm or wrist fracture can be considered (although a proximal forearm fracture is less likely to be successful, it can still be attempted)

