PAEDIATRIC ACUTE CARE GUIDELINE	
Fractures – Distal Forearm / Wrist	
Scope (Staff):	All Emergency Department Clinicians
Scope (Area):	Emergency Department

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Fractures – Distal Forearm / Wrist

This guideline is specific for the assessment and management of distal forearm and wrist fractures

Background

- Fracture of the distal third of the radius +/- ulna is the commonest fracture in children
- Wrist injuries in children are far more likely to involve the distal radius / ulna rather than the carpal bones
- The most common mechanism of injury is a fall onto outstretched hand (FOOSH)

General

- Epiphyseal fractures occur from approximately 6-12 years
- Scaphoid fractures usually occur in children > 12 years. It is usually the distal pole of the scaphoid which is involved.
- Galeazzi fracture dislocation occurs in school age children but is rare

Assessment

- Subtle buckle fractures are often missed
- Neurovascular complications are rare but should be assessed

History

- The most common mechanism of injury is fall onto outstretched hand

Examination

- There is usually localised tenderness and swelling with decreased range of movement
- Limitation in supination may be a sign of minor buckle fractures
- Clinical deformity is usually evident in displaced fractures (most commonly dorsal displacement and angulation)
- In older children, look for clinical signs for scaphoid fracture: anatomical snuffbox tenderness, pain on longitudinal compression of thumb and pain on supination against resistance
- Look for neurovascular compromise and open wounds

Investigations

Radiology:

- Standard AP and lateral view of the wrist. See Radiology Requests – Limb X-Rays.
- Request scaphoid views if there is clinical suspicion of a scaphoid fracture
- For a description of types of fractures, see Fractures – Overview

Management

- Simple dorsal buckle fractures can be managed in a buckle splint for 3 weeks
- Greenstick and complete fractures must be immobilised in a plaster backslab
- Displaced, significantly angulated and clinically deformed fractures usually require reduction
- Clinical suspicion of scaphoid fracture warrants immobilisation

Initial management

- Analgesia
- Examination for neurovascular injury (if deficits evident manage immediately) – urgent Orthopaedic Team referral
- Ice and elevation of affected limb
- Immobilise suspected fracture before the X-Rays (e.g. splint, board)
- Keep fasted if there is clinical deformity
- Antibiotics for compound fractures and consider tetanus

Further management

Buckle Fractures

- Buckle (or torus) fractures are most commonly seen in the distal radial metaphysis and are a result of compressive forces from an axial load on softer bones in children
- X-Ray changes may be subtle with mild cortical bulging on the AP view and angulation on the lateral view may be evident

Buckle fracture of the distal radius and ulna with minimal dorsal angulation

Buckle fractures can be managed in a buckle wrist splint if:

- There is dorsal angulation
- There is less than 15 degrees angulation
- There is no cortical disruption
- The fracture involves the distal third of the radius
- The ulna does not have a greenstick or a complete fracture (buckle of the ulna is okay)

The buckle wrist splint is kept on day and night for 3 weeks and patients are advised to avoid sport for a further 3 weeks after splint removal. No specific follow up is required for simple dorsal buckle fractures. See Buckle Splint Application and Buckle Fracture Health Facts. If a wrist splint is unavailable, immobilise in a below elbow plaster backslab for 3 weeks.

Buckle fractures that are **not** suitable for a wrist splint:

- Volar angulation
- Cortical disruption (= greenstick fracture)
- Ulna greenstick, complete or styloid fracture
- Greater than 15 degrees angulation or obvious clinical deformity – will likely need reduction (refer to Orthopaedic Team urgently)

These fractures should be managed in a below elbow plaster backslab and followed up in Orthopaedic Fracture clinic in 7-10 days. See Outpatient Clinics.

Subtle buckle fracture of distal radius on AP view (arrow) with obvious volar angulation on the lateral view	Disruption of volar cortex (arrow)

Metaphyseal Fractures

- The radius usually has a greater degree of injury than does the ulna
- The radius can be involved in isolation (never the ulna in isolation – always look for associated radius fracture or radial head dislocation)
- When both bones are involved, they often each have a different fracture type, a combination of complete, greenstick, torus (buckle) fractures, or plastic bowing deformity
- Minimally displaced and minimally angulated metaphyseal fractures of the radius and ulna are managed in an above elbow plaster backslab (for 6-8 weeks) with Orthopaedic Fracture clinic follow up in 7-10 days. See Outpatient Clinics. These fractures have a tendency to displace or angulate further if not immobilised appropriately.
- Fractures with greater than 20 degrees of dorsal angulation, greater than 10 degrees of volar angulation, significant displacement or clinical deformity should be referred urgently to the Orthopaedic Team for reduction.

Transverse fracture of distal radius with 15 degrees of dorsal angulation	Completely displaced fracture of distal radius and ulna

Radial Physeal Fractures

- Fractures involving the growth plate are usually Salter-Harris II fractures
- Undisplaced Salter-Harris I and V fractures may not be obvious on X-Ray – immobilise in a plaster backslab if there is clinical suspicion (point tenderness and localised swelling of the distal radius)
- Salter-Harris I and II fractures rarely affect growth of the limb
- Salter-Harris III and IV fractures may cause growth disturbance and should be referred to the Orthopaedic Team. Look for associated ulna injury: fracture of the distal ulna, avulsion of the ulnar styloid or rarely, fracture separation of the ulna epiphysis.
- Minimally displaced and minimally angulated Salter-Harris I and II fractures should be immobilised in a below elbow plaster backslab and followed up in Orthopaedic Fracture clinic in 7-10 days. See Outpatient Clinics.
- Salter-Harris I and II fractures with greater than 20 degrees angulation or significant displacement and Salter-Harris III and IV fractures should be referred urgently to Orthopaedic Team for possible reduction

Salter-Harris I fracture of distal radius	Undisplaced Salter-Harris II fracture of distal radius	Salter Harris II fracture with dorsal and radial displacement

Scaphoid Fractures

- Suspect scaphoid fractures in older children (> 10 years) who have fallen on outstretched hand with anatomical snuffbox tenderness, pain on longitudinal compression of the thumb and pain on supination against resistance
- Scaphoid fractures in adolescents are usually non-displaced fractures of the distal pole
- They are not always evident on X-Ray
- **Displaced** scaphoid fractures should be referred immediately to Orthopaedic Surgeon as they may need fixation.
- **Non-displaced** scaphoid fractures are treated in a below elbow plaster backslab with follow up in Orthopaedic Fracture Clinic in 7-10 days.
- If there is **clinical suspicion without X-Ray changes**, immobilise in a buckle splint. If >10 years age, follow up in Orthopaedic Fracture clinic in 7-10 days with a repeat X-Ray. For patients <10 years age, no formal follow up is required (scaphoid fracture extremely unlikely in this age group).

A: Undisplaced distal scaphoid fracture. B: Sclerotic line in follow up X-Ray 2 weeks later.

Galeazzi Fracture Dislocation

- A rare fracture of the distal half of the radial shaft with a disrupted distal radio-ulnar joint
- Refer immediately to Orthopaedic Surgeon for reduction

Fractures of Distal Radius & Ulna Requiring Urgent Orthopaedic Referral

- Neurovascular compromise
- Compound fractures
- Significant angulation (>20 degrees dorsal or >10 degrees volar) or significant displacement
- Clinical deformity
- Monteggia and Galeazzi fracture dislocations
- Salter-Harris III and IV fractures

Referrals and follow-up

- Plaster check within 24 hours
- All fractures of distal radius and ulna (except simple dorsal buckle fractures) should be followed up in Orthopaedic Fracture clinic in 7-10 days. See Outpatient Clinics.
- Mildly angulated dorsal buckle fractures require no specific follow up

Health information (for carers)

- Pain Management Health Fact Sheet
- Patients With Plasters – Health Fact Sheet
- Advise parents of the signs and symptoms of compartment syndrome
- Buckle Fracture Health Fact Sheet

Management paperwork

- Buckle Fracture – General Practice Letter

Tags

buckle, distal, forearm, fractures, galeazzi, radius, scaphoid, ulna, wrist

References

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