DISTAL FOREARM FRACTURES IN CHILDREN

- The distal radius and ulna are among the commonest sites of childhood fractures. The break may occur through the distal radial physis or in the metaphysis of one or both bones.
- Metaphyseal fractures are often incomplete or greenstick.

Mechanism of injury
- The usual injury is a fall on the outstretched hand with the wrist in extension; the distal fragment is forced posteriorly (this is often called a ‘juvenile Colles’ fracture’).
- However, sometimes the wrist is in flexion and the fracture is angulated anteriorly.
- Lesser force may do no more than buckle the metaphyseal cortex (a type of compression fracture, or torus fracture).

Clinical features
- There is usually a history of a fall, though this may be passed off as one of many childhood spills.
- The wrist is painful, and often quite swollen; sometimes there is an obvious ‘dinner-fork’ deformity.
- X-ray The precise diagnosis is made on the x-ray appearances. Physeal fractures are almost invariably Salter–Harris type I or II, with the epiphysis shifted and tilted backwards and radially. Metaphyseal injuries may appear as mere buckling of the cortex (easily missed unless appropriate views are obtained), as angulated greenstick fractures or as complete fractures with displacement and shortening. If only the radius is fractured, the ulna may be bent though not fractured.

Treatment
- Physeal fractures are reduced, under anaesthesia, by pressure on the distal fragment.
- The arm is immobilized in a full-length cast with the wrist slightly flexed and ulnar deviated, and the elbow at 90 degrees.
- The cast is retained for 4 weeks.
- These fractures very rarely interfere with growth. Even if reduction is not absolutely perfect, further growth and modelling will obliterate any deformity.
- Patients seen more than 2 weeks after injury are best left untreated.
- Buckle fractures require no more than 2 weeks in plaster, followed by another 2 weeks of restricted activity.
- Greenstick fractures are usually easy to reduce – but apt to re-displace in the cast!
- Some degree of angulation can be accepted: in children under 10, up to 30 degrees and in children over 10, up 15 degrees.
- If the deformity is greater, the fracture is reduced by thumb pressure and the arm is immobilized with three-point fixation in a full-length cast with the wrist and forearm in neutral and the elbow flexed 90 degrees.
• The cast is changed and the fracture re-x-rayed at 2 weeks; if it has re-displaced a further manipulation can be carried out.
• The cast is finally discarded after 6 weeks.
• Complete fractures can be embarrassingly difficult to reduce – especially if the ulna is intact. The fracture is manipulated in much the same way as a Colles’ fracture; the reduction is checked by x-ray and a full-length cast is applied with the wrist neutral and the forearm supinated.
• After 2 weeks, a check x-ray is obtained; the cast is kept on for 6 weeks.
• If the fracture slips, especially if the ulna is intact, it should be stabilized with a percutaneous K-wire.

Complications

➢ EARLY
• Forearm swelling and threatened compartment syndrome: This dire combination can be prevented by avoiding over-forceful or repeated manipulations, splitting the plaster, elevating the arm for the first 24–48 hours and encouraging exercises.

➢ LATE
• Malunion This late sequel is uncommon in children under 10 years of age. Deformity of as much as 30 degrees will straighten out with further growth and remodelling over the next 5 years. This should be carefully explained to the worried parents.
• Radio-ulnar discrepancy Premature fusion of the radial epiphysis may result in bone length disparity and subluxation of the radio-ulnar joint. If this is troublesome, the radius can be lengthened and, if the child is near to skeletal maturity, the ulnar physis fused surgically.