Knee & Lower Leg Fractures

Ottawa Knee Rules (~100% Sens, 30-50% Spec – similar in children)

X-ray knee if:

- Not weight bearing (4 steps) immediately or in A & E, OR
- Patella tender, OR
- Flexion is less than 90°, OR
- Age > 55 years, OR
- Fibula head tender

Pittsburgh Knee Rules (~100% Sens, 50-60% Spec)

X-ray knee if:

- Blunt trauma, AND
- Not weight bearing in A & E, OR
- Age < 12 years, OR
- Age > 50 years

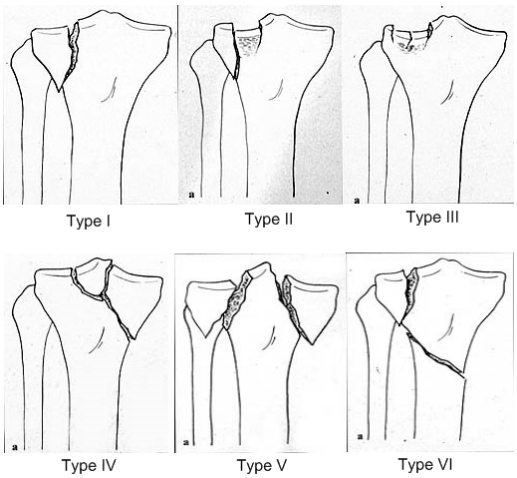
Knee X-rays

- Low yield ~6%
- Lipohaemarthrosis (fat on blood) on lateral → intra-articular # + marrow communication
- Beware fabella sesamoid bone in gastrocnemius lat head & growth plate of tibial tuberosity
- MRI sensitive (~95%) for all injuries. CT more avail.
- Beware of normal variants: bi- or tri-partite patella
- May need skyline patella view to see some vertical #s

Patella fracture

- Usually direct blow from fall on flexed knee.
- Usually transverse (~60%), stellate/comminuted (30%), or vertical (~10%)
- Can also have avulsion # with forceful quad contraction.
- Mx:
  - POP or Zimmer splint if undisplaced with intact extensor mechanism.
  - ORIF if displaced.
  - Partial [or even total patellectomy (rare as → instability)] if very comminuted.

Tibial plateau fracture



- Common in elderly
- Lateral tibial condyle > medial
- Classification (Schatzker) – see diagram on right.
- Type IV has worst prognosis
- Mx:
  - Lat # with depression/displacement<4mm & valgus deformity<10° then → Non-op
  - Otherwise → ORIF likely.

Segond fracture of proximal tibia

- Small avulsion # of proximal lateral tibia, often undisplaced & hard to see on XR
- Assoc with sports injury and ACL (75-100%) & medial meniscus (66-75%) tears
- From avulsion of part of insertion of lateral collateral ligament complex

Tibial shaft fracture

- High incidence of open #
- Look for assoc fibula #
- Indications for OT:
    - Intra-articular extension of #
    - Assoc ipsilateral femoral #
    - Bilateral #
    - Open #
    - Shortening >2cm
    - >50% cortical displacement
    - Compartment syndrome
- Cx: Open #, infection, neurovasc injury, compartment syn, non-union
- Mx: Measure pressures. Fasciotomy

Tibial Compartment Syndrome

- Up to 20% closed #'s, less common with open #
- POP ↑risk
- Features: ↑pain, tenderness over muscles, isolated ↑pressure in post compartment followed by isolated ↑pressure in ant compartment
- Anterior compartment syndrome
    - Weakness of active toe extension
    - Pain on passive toe flexion
    - ↓Sensation 1st web space
- Posterior compartment syndrome
    - Weakness of active toe flexion & ankle inversion
    - Pain on passive toe extension
    - ↓Sensation sole

Toddler's fracture

- Undisplaced (or minimally displaced) spiral # of tibia in child refusing to weight-bear
- Twisting injury with foot planted
- Often difficult to see on XR

Tibial stress fractures

- Adolescents: proximal 1/3. Runners: junction middle-distal thirds
- Point tenderness
- X-ray may be normal initially. (Can do bone scan)
- Mx: Reduce activity. May last >1yr.

Shin splints

- Medial tibial stress syndrome
- Exercise induced pain in mid-leg - ?periostitis
- Less localised than stress fracture
- Assoc with varus deformities of knee & foot.
- Mx: Rest

Isolated fibula fracture

- Uncommon (look for tibial #)
- Mx: Often conservative.
- Common peroneal nerve injury (→ foot drop) risk if # of fibula head.