

Closed fracture manipulation

Sedation/anaesthesia options

Can use any, or a combination of, below options:

- Sedation – better for younger patients (see [procedural sedation](#) notes)
- Entenox – good for all patients
- Local nerve blocks – very effective if appropriate block can be performed, especially good in elderly (see [local nerve block](#) notes)

Introduction

- **W**ash hands, **I**ntroduce self, **P**atients name & DOB & wrist band, **E**xplain procedure and get consent
- Ensure plaster technician is available with plaster trolley, and assistant for counter traction if required
- Confirm the correct site with the patient and X-ray
- Plan reduction technique using X-ray
- Check and document distal neurovascular status **before and after** manipulation (note: reduce urgently if there is neurovascular compromise)
- Get an X-ray **before and after** manipulation

General procedural detail

Positioning and exposure

- Expose the site
- Position patient
- Apply sheets to prevent plaster getting on bed/patient's clothes

Ensure analgesia or sedation is appropriate

- Test sensation/pain

Manipulation

- Check plaster technician is ready and ask them to apply stockinette ± webril
- Manipulate fracture (specific details below)
- Ask assistant to apply plaster while holding limb in correct position until plaster dries
- Ask assistant to apply outer bandage layer when almost dry

Cleaning

- Clean area and bin waste
- Check neurovascular status
- Order post-manipulation X-ray
- Give patient cast advice and book them fracture clinic appointment

Some specific manipulation techniques (for common displaced fractures suitable for closed reduction)

Colles' fracture

- Usually use haematoma block ± entenox for analgesia
- An extra assistant is required and must apply firm counter traction to upper forearm near elbow
- Holding both hands around fracture site with your thumbs on the top of their arm (proximal to fracture site) and fingers below (distal to fracture site):
 1. Exaggerate angulation deformity (by dorsally angulating fracture even more ++ i.e. pull hand upwards a lot!) to disimpact fracture
 2. Lengthen by pulling on their hand (requires very firm traction for a few minutes)
 3. Firmly apply volar angulation to the fracture site (almost like breaking the fracture again in the opposite direction) and flex their wrist
 4. Ulna deviate their wrist by pulling thumb in line with forearm
 5. Hold their wrist firmly in flexion and ulnar deviation while backslab is applied
- Assistant to apply below elbow backslab (Colles' position)

Ankle fractures

Bimalleolar and trimalleolar fractures will usually require fixation but often require manipulation while awaiting swelling to resolve before surgery.

- Usually require sedation
- Patient's knee flexed over examination table (or them lying in bed if more practical)
- Ask assistant to apply stockinette and webril

- **Reducing ankle fracture-dislocation**
 - Grasping their hindfoot, apply traction as if you are 'taking their shoes off', in order:
 1. Correct posterior subluxation by lifting heel anteriorly
 2. Correct external rotation
 3. Correct ab/adduction
- **Repositioning ankle fracture which is not dislocated**
 - Ask assistant to apply plaster first (wet)
 - Much less pressure is required – just move the ankle joint into the correct place while plaster dries as below
- Ensure the ankle is held in the correct position – *note it is a very unstable fracture and will fall out of place with gravity if not supported properly*
 - Ensure ab/adduction is correct (i.e. ankle is in line with lower leg)
 - Ensure posterior subluxation is correct (hold ball of foot anteriorly or hold foot up with great toe to ensure heel is in line with back of shin and ankle is at 90°)
 - Tweak the external rotation of ankle to match other side (look at position of the toe in line with the knee)
- Hold in place while below knee backslab is applied

Displaced metacarpal fracture/fracture-dislocation

- Usually use entenox ± morphine for analgesia
- Apply firm pressure over side of fracture to press back into position
- Apply dorsal/volar forearm slab or radial/ulnar gutter splint

Long bone fractures with neurovascular compromise

- Analgesia options include morphine, local nerve blocks, entenox, sedation
- Neurovascular compromise means they need to be done urgently before theatre
- Apply longitudinal in-line traction to reposition bone
- Use skin/skeletal traction to maintain alignment if possible