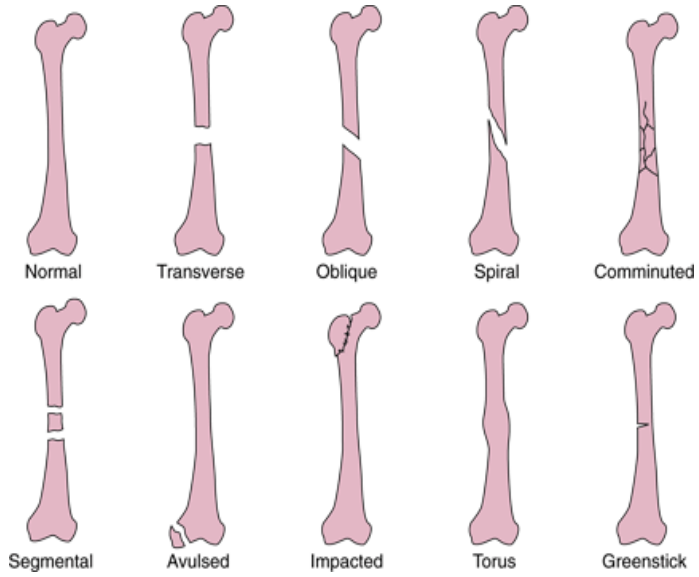
Unit VII – Problem 2 – Clinical: Principles of Orthopedics

- **Definition of orthopedics**: study of the musculoskeletal system which includes:
  - Bones.
  - Joints.
  - Ligaments.
  - Muscles.
  - Tendons.
  - Nerves.
- **Trauma**: more than 70% of orthopedic cases are caused by trauma:
  - **Fractures:**
    - ✓ Definition: loss of continuity of the bone.
    - ✓ Shoulder, humerus, elbow, shafts of radius and ulna, distal radius and hand.
    - ✓ Types: traumatic, pathologic and stress.
  - **Dislocation:**
    - ✓ Shoulder, elbow and wrist joints.
- **Types of fractures (according to pattern):**



  - **Transverse fracture**: caused by shear (2 forces against each other). For example, elevator door closing from both sides on a bone. In addition, direct trauma (with a stick) can lead to transverse fracture.
  - **Oblique fracture**: the mechanism which is causing this type of fracture is bending. For example, when you are walking and suddenly your leg is trapped in a hole and you lean forward.
  - **Spiral fracture**: caused by twisting.
  - **Avulsion**: occurs due to a pulling force of a tendon or a ligament. Usually this happens at the end of bones where many strong tendons/ligament are attached. These tendons/ligament don't rupture, instead they pull part of the bone to which they are attached with them.
  - **Impaction**: caused by compression.
  - **Greenstick (مرن مثل العود الأخضر):** one side breaks, the other doesn't. this type of fracture is happening only in pediatric (not found in adults!).
  - **Simple fracture**: closed – not penetrating the skin.
  - **Compound fracture**: opened – penetrating the skin.
- **How to differentiate between oblique and spiral fractures?**
  - **By looking to the shape of the fracture:**
    - ✓ Spiral: lazy S-shaped.
    - ✓ Oblique: straight line directed obliquely.

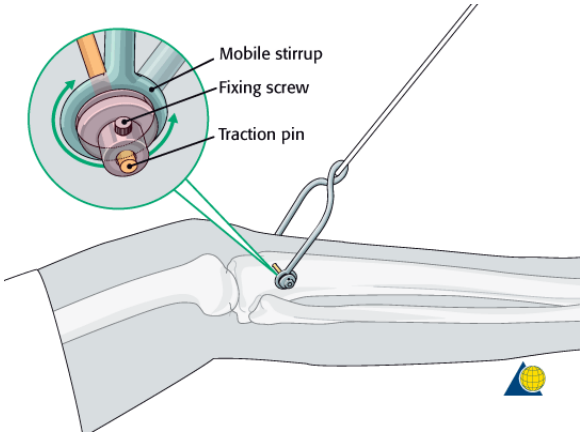
- **Role of 2 in radiology:**
  - 2 views (AP + lateral).
  - 2 opinions.
  - 2 joints (proximal and distal joints to the fracture).
  - 2 occasions.
  - 2 sides.
- **Treatment of fractures:**
  - **Non-operative:**
    - ✓ Cast: it is of 2 types (POP or fiberglass which is colored and used mainly for children):
      - ❖ Below elbow cast.
      - ❖ Below knee cast.
      - ❖ Above elbow cast.
      - ❖ Above knee cast.
      - ❖ Pantaloon cast: used in case of DDH or fracture in the femur.
      - ❖ Minerva jacket: in thoracic or cervical spine fractures.



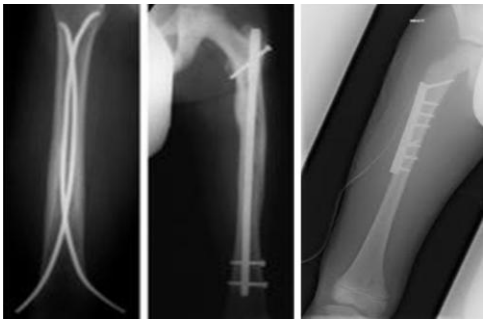



    - ✓ Skin traction:

  - **Operative:**
    - ✓ Skeletal traction:



    - ✓ Nails and screws:
      - ❖ Flexible intramedullary nails (in pediatrics).
      - ❖ Rigid intramedullary nail (for adults).
      - ❖ External screws.



- **Why is fracture immobilized:**
  - To prevent bone displacement.
  - To prevent injury to vessels or nerves.
  - To reduce pain.
- **Healing of fractures:**
  - **Upper limb**: 4-6 wks.
  - **Lower limb**: 8-12 wks.