



How to Approach the Pediatric Elbow Radiograph

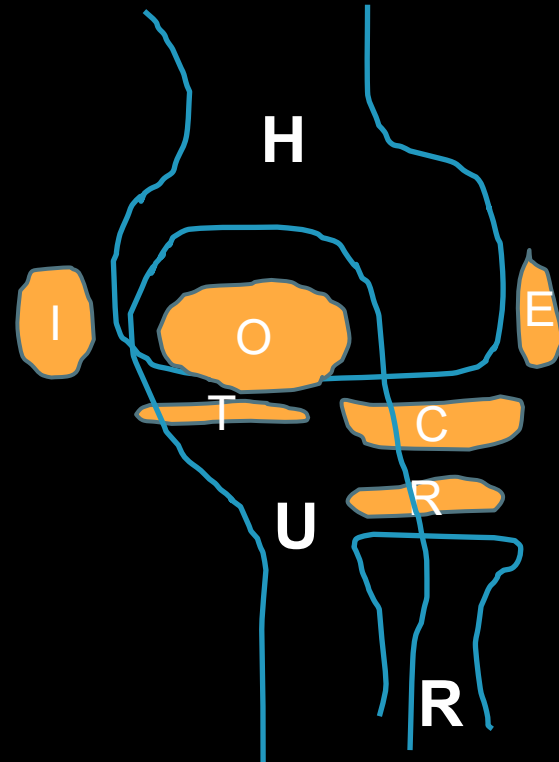
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Step 1: know your Elbow Ossification Centers (and rough age of appearance)

- CRITOE!!
- C – Capitellum (1 yr)
- R – Radial head (2-4 yrs)
- I – Medial (Internal) epicondyle (4-6 yrs)
- T – Trochlea (8-11 yrs)
- O – Olecranon (9-11 yrs)
- E – Lateral (External) epicondyle (10-11 yrs)

H - humerus, U - ulna, R - radius

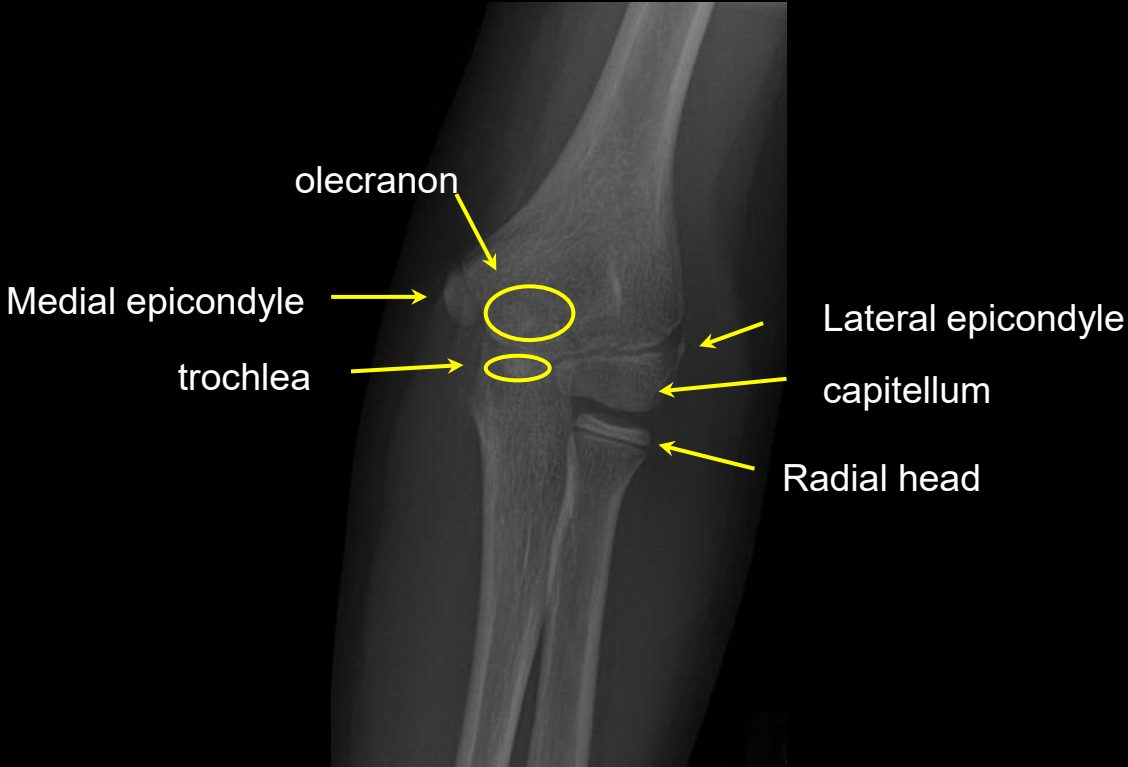


Ossification Centers

Frontal radiograph of elbow in 12 year old girl



Ossification Centers





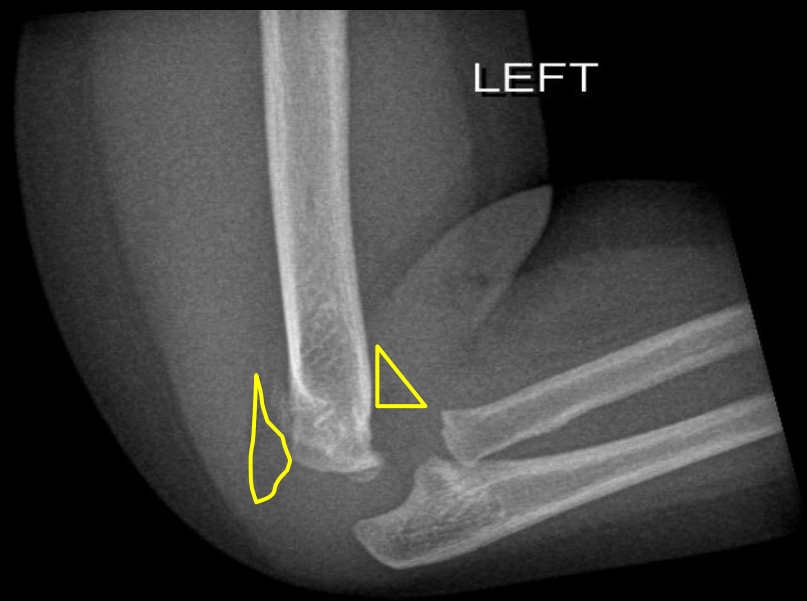
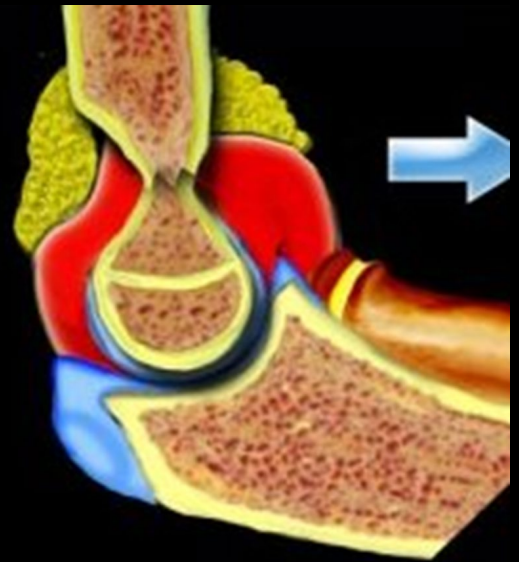
Step 2: Elbow Fat Pads

- Anterior fat pad (highlighted in yellow) – coronoid fossa, normally visible in lateral view with patient in flexion
- Posterior fat pad – olecranon fossa, not normally visible
- Fat pads are intracapsular
- When displaced, they indicate the presence of joint effusion or hemarthrosis, ie. fracture in setting of trauma!





Displaced fat pads

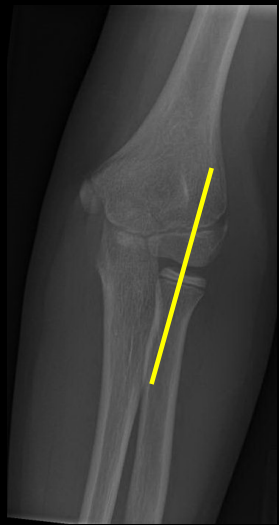




Step 3: Joint Alignment



Radiocapitellar Line on both views



- A) Radiocapitellar line – a line drawn through the center of the radial head should intersect the center of the capitellum on all projections
- If it doesn't – radial head dislocation, radial neck fracture



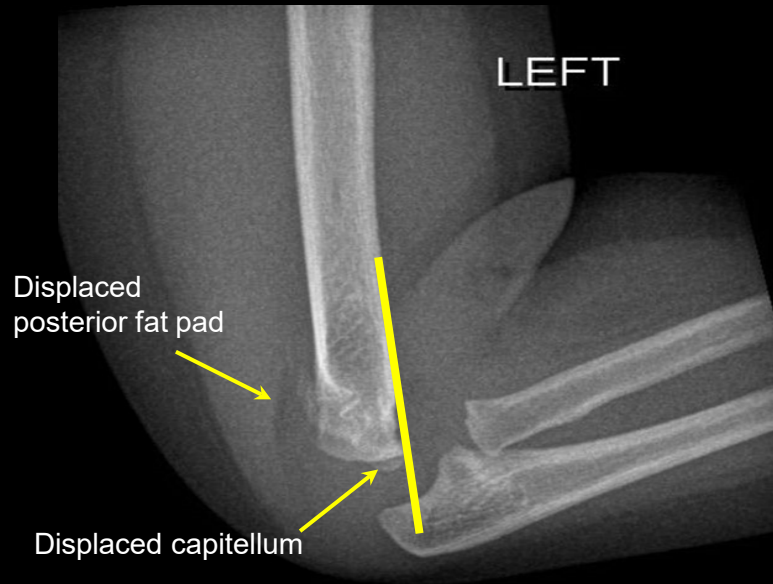
Step 3: Joint Alignment



- B) Anterior humeral line – intersects the ossified capitellum through middle or posterior third
- If it passes through anterior third or misses capitellum – supracondylar fracture is present



Displaced anterior humeral line, Ex. 1 yo, fall from bed





Elbow fractures

- Most common fractures in children (65-75%)
- Most commonly occurring after FOOSH
(hyperextension forces or extreme valgus)
- Difficult to detect due to ossification centers
- Supracondylar > lateral condyle > medial epicondyle > radial neck, olecranon

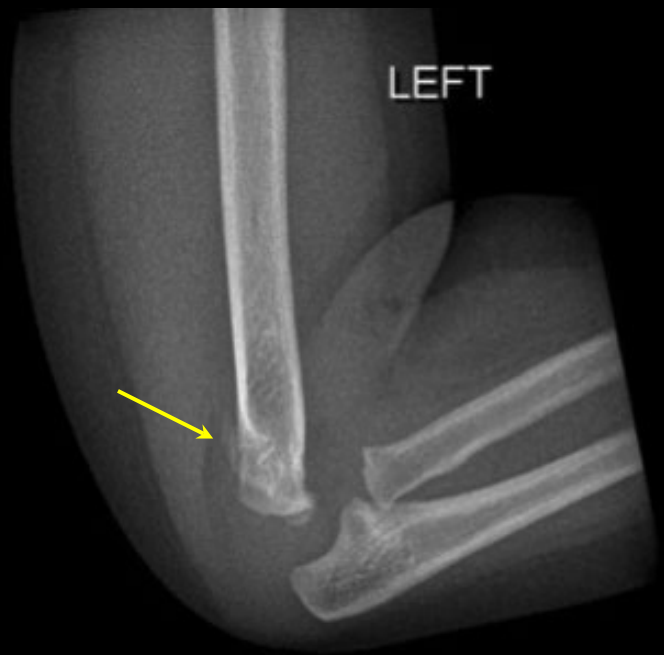


Supracondylar fractures

- Most common pediatric elbow fracture
- Type 1 - non-displaced
- Type 2 – displaced with intact posterior cortex
- Type 3 – displaced with no cortical contact



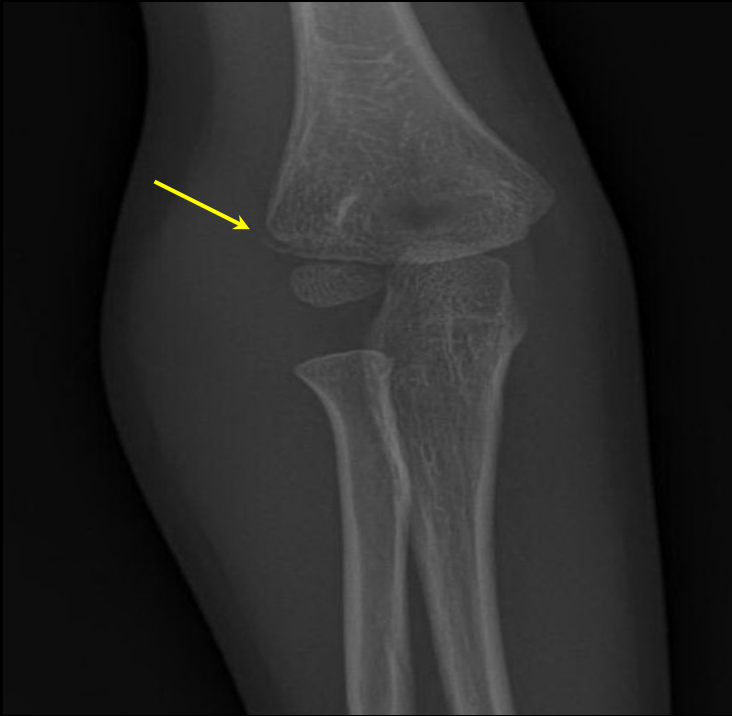
Supracondylar fracture





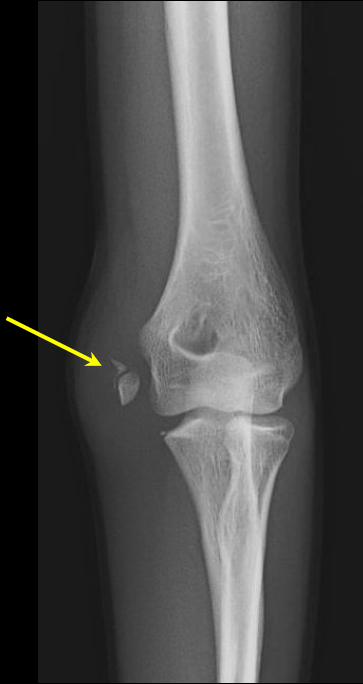
Lateral condylar fracture

- FOOSH with extreme varus force and extension





Medial epicondylar fracture



- 3rd most common fracture
- Valgus stress
- Commonly associated with elbow dislocation

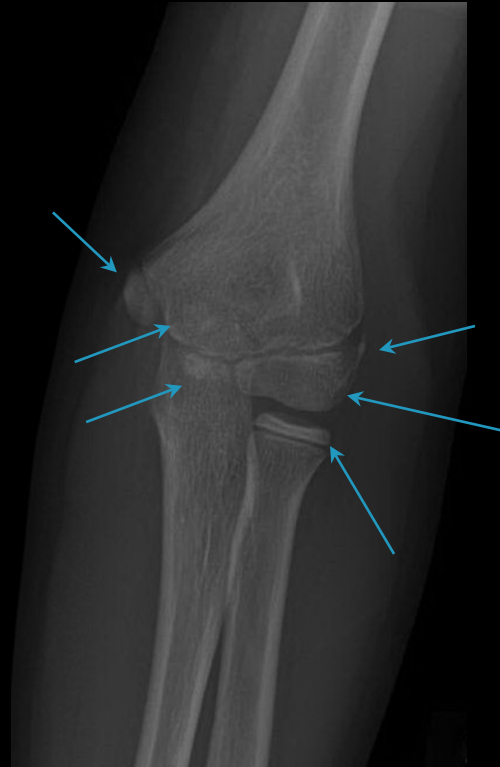


Radial neck fracture



Test your knowledge!

Name the ossification centers!



Slide 4 for answers!

What type of fracture?



Supracondylar Fracture





Summary

- Identify ossification centers (CRITOE!)
- Use a search pattern - fat pads, alignment (anterior humeral line, radiocapitellar line)
- Look for:
 - Supracondylar fx
 - Lateral condyle fx
 - Position of medial epicondyle
 - Radial neck fx