Calcium pyrophosphate dihydrate deposition disease

- CPPD is commonest in patients over the age of 50. Men and women are equally affected.
- Causes of CPPD can be divided into:
- Idiopathic
- Hereditary
  - AD pattern; mutation in the *ANKH* gene which encodes a transmembrane inorganic pyrophosphate transporter
- Secondary
  - hemochromatosis
  - hyperparathyroidism
  - hypothyroidism
  - hypomagnesemia [2]
  - previous joint injury
  - ochronosis

Imaging

- Many features of osteoarthritis with an unusual distribution.
- For example, they tend to be symmetric in distribution and involve non-weight bearing joints or, in the hands, mainly involve the intercarpal and metacarpophalangeal joints.
- Features of osteoarthritis in joints that are not commonly affected by it (i.e. non-weight bearing joints) [12]:
- Wrist joint (mainly radiocarpal and scapholunate joints)
  - SLAC wrist can be seen in advanced cases
  - a stepladder pattern of joint narrowing is classically described in which the narrowing is progressively less severe from the radiocarpal joint to the midcarpal joint
- Metacarpophalangeal joints
  - 2nd and 3rd preferentially
  - hook-like osteophytes
- Patellofemoral joint
- Shoulder joint
- Elbow joint


PYROPHOSPHATE
ARTHROPATHY
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Calcium pyrophosphate (continued)

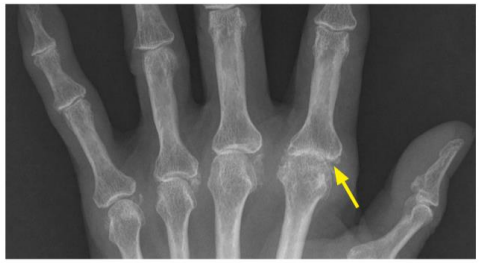
Chondrocalcinosis: Frontal radiograph of the wrist demonstrates chondrocalcinosis of the triangular fibrocartilage complex (TFCC, yellow arrow) and at the index MCP (red arrow).

Advanced CPP arthritis with SLAC arthropathy: Frontal radiograph of the wrist in a different patient shows fragmentation of the scaphoid (arrow) with proximal migration of the capitate. There is chondrocalcinosis of the TFCC and scattered mineralizations about the wrist.

- In the knee, the patellofemoral compartment is affected first, but all three compartments may become involved. Isolated degenerative changes of the patellofemoral joint may be due to CPP arthritis (usually in an older person, especially if there are subchondral cysts and chondrocalcinosis) or patellar maltracking.

CPP arthritis of the knee. Frontal (left image) radiograph of the knee shows prominent chondrocalcinosis of the menisci and articular cartilage (arrows) with small medial tibiofemoral osteophytes. There is severe patellofemoral osteoarthritis with bone-on-bone articulation laterally. In this patient, subchondral cysts were not demonstrated.

- In the hands, involvement of the second and third MCP joints is typical, producing characteristic *hook-like* osteophytes from the radial aspect of the metacarpal heads. A similar appearance can be seen in hemochromatosis, which may feature more extensive involvement of the MCPs, although there is a large crossover in imaging.

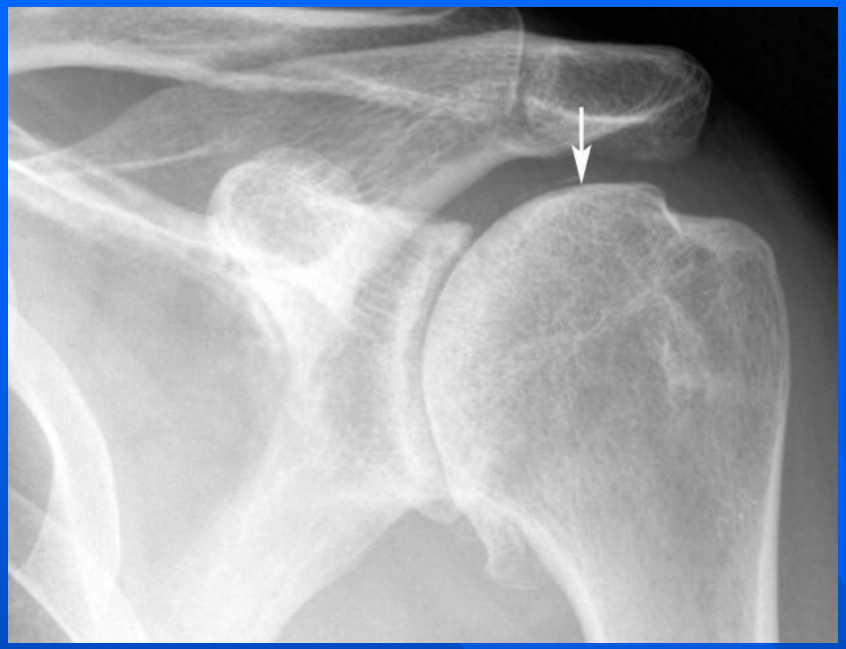


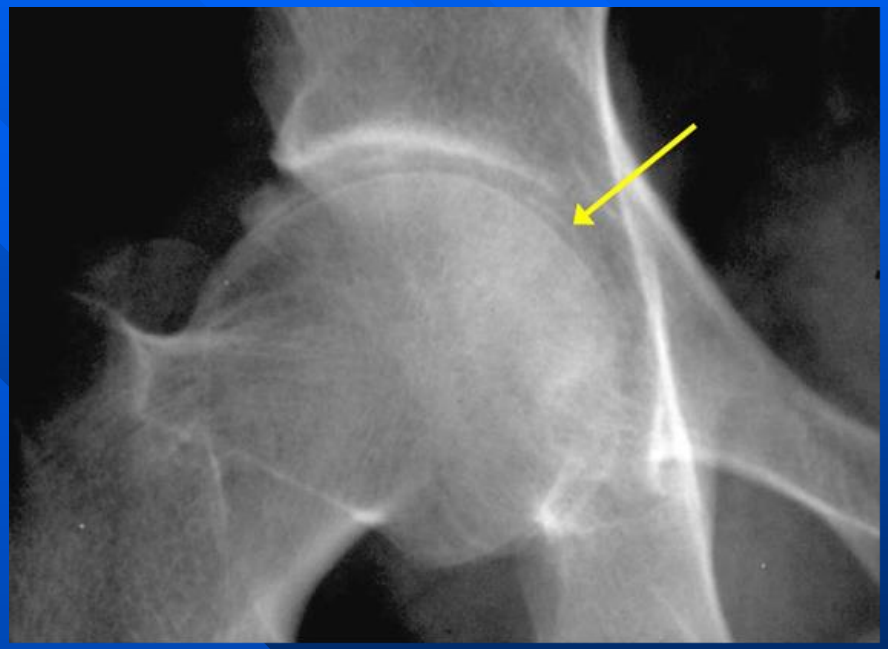
Frontal radiograph of the hand in the same patient with knees imaged above demonstrates osteophytes of the MCPs with severe cartilage space loss at the index finger (arrow). There is prominent chondrocalcinosis of all MCPs.

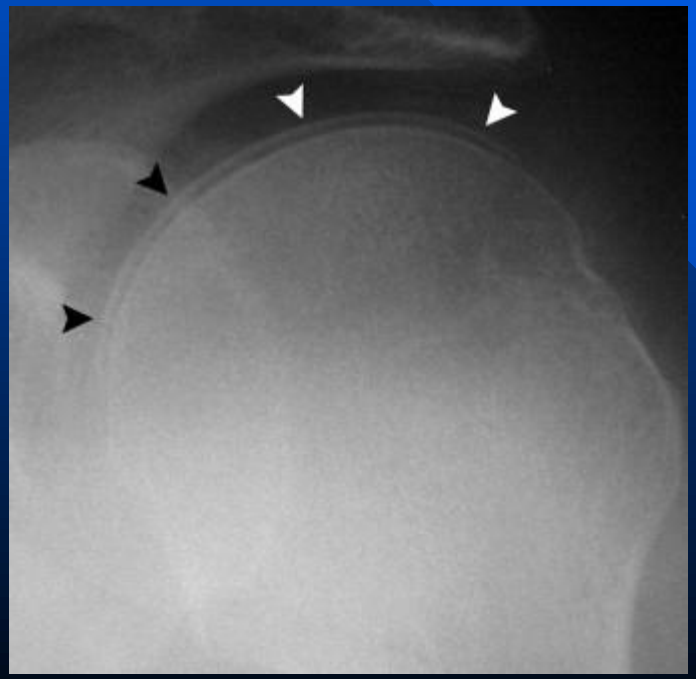
Chondrocalcinosis

Chondrocalcinosis is seen in the triangular fibrocartilage of this wrist

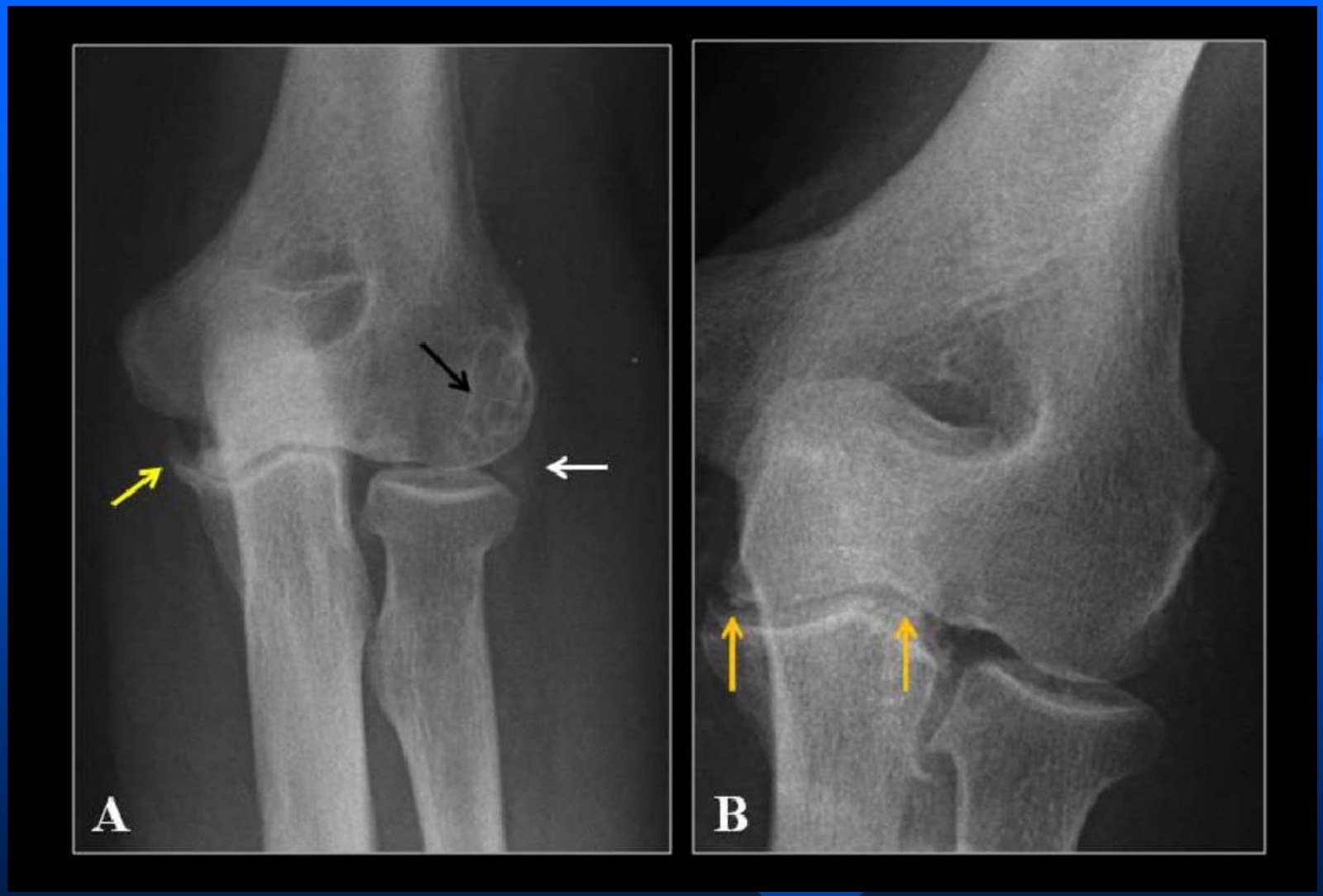
Common to involve scaphoid and trapezium joint







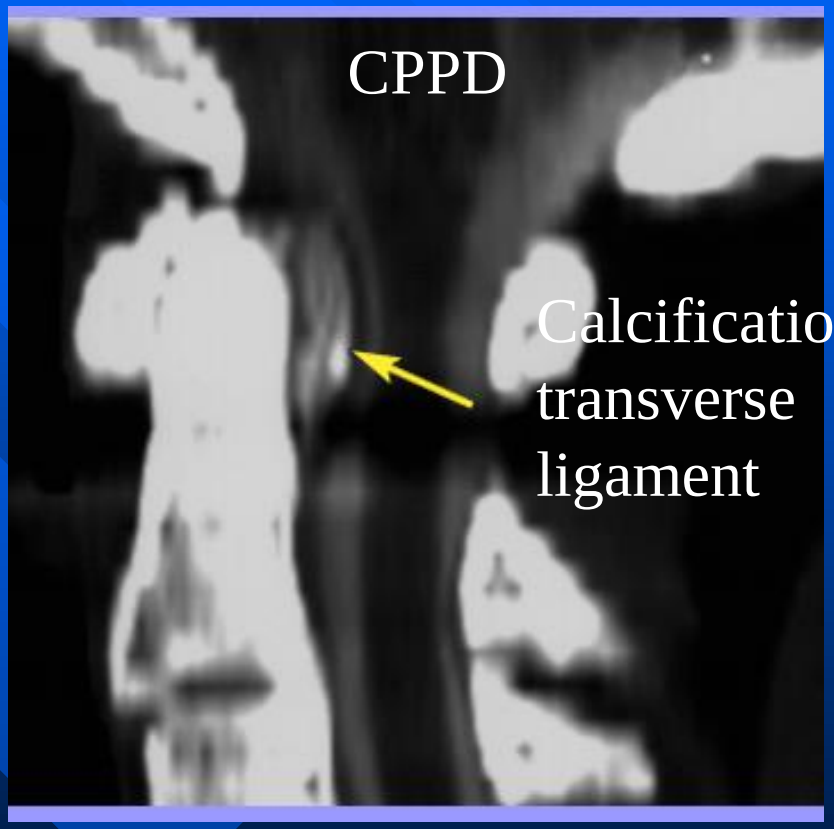

R
LR


A
B

- Chondrocalcinosis in the triangular fibrocartilage of the ulna (white arrow).
- There is narrowing of the radio-carpal joint and proximal migration of the capitate into the widened space between the scaphoid and the lunate (yellow arrow).

CPPD

CPPD vs RA vs OPLL



No erosions or ossification of the Posterior longitudinal ligament

CPPD