



What can Imaging tell us?

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Imaging @ Olympic Park

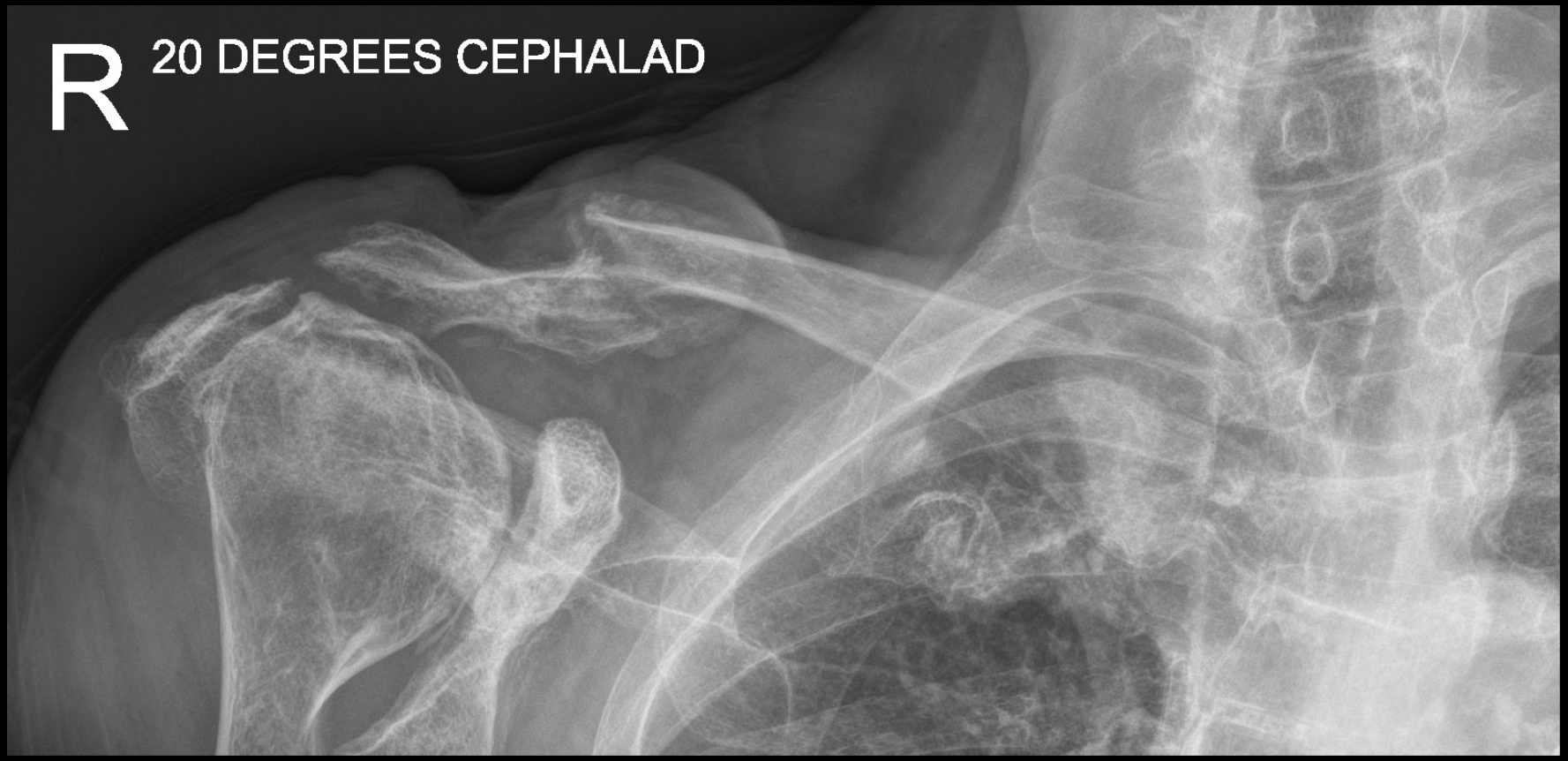
LA TROBE UNIVERSITY

Epworth

The Shoulder Symposium
Epworth MSK Clinical Institute
Melbourne 16 June 2017

Case Study

A 94yo presents with a stiff but not painful shoulder



Case Study

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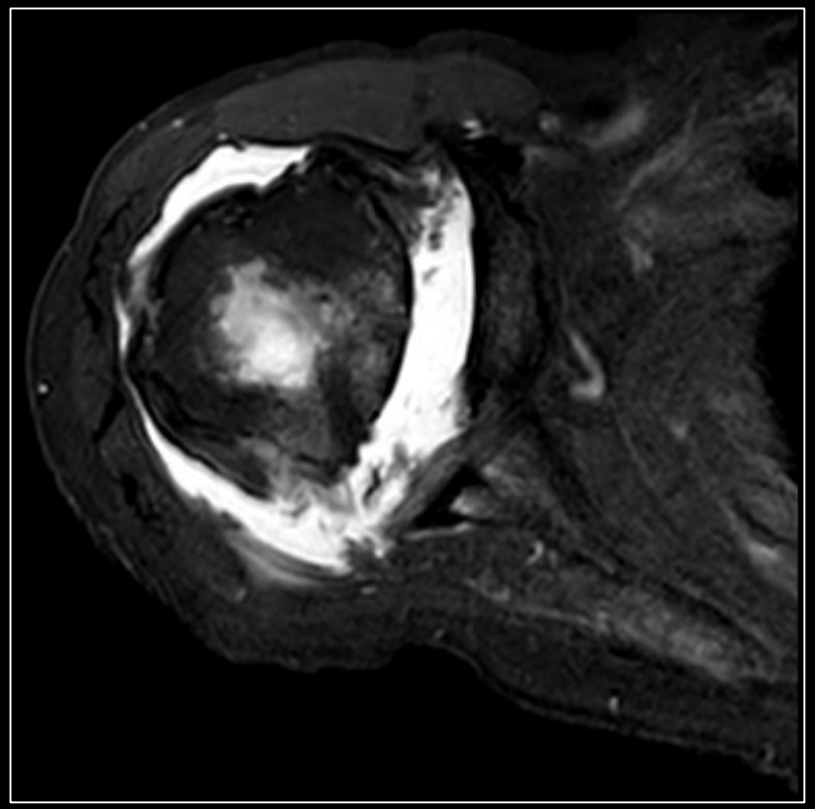
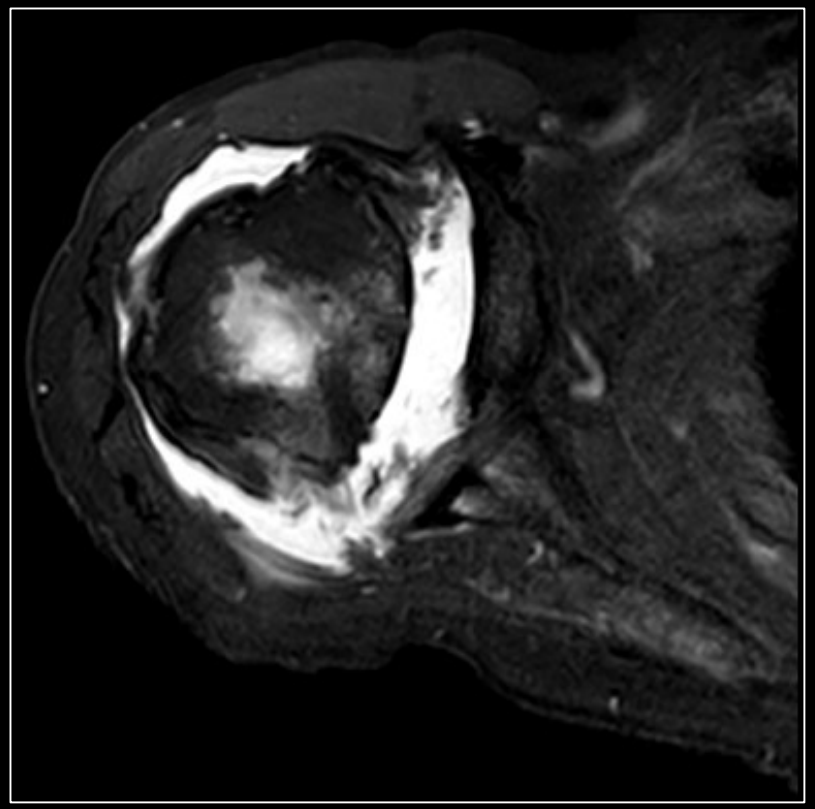
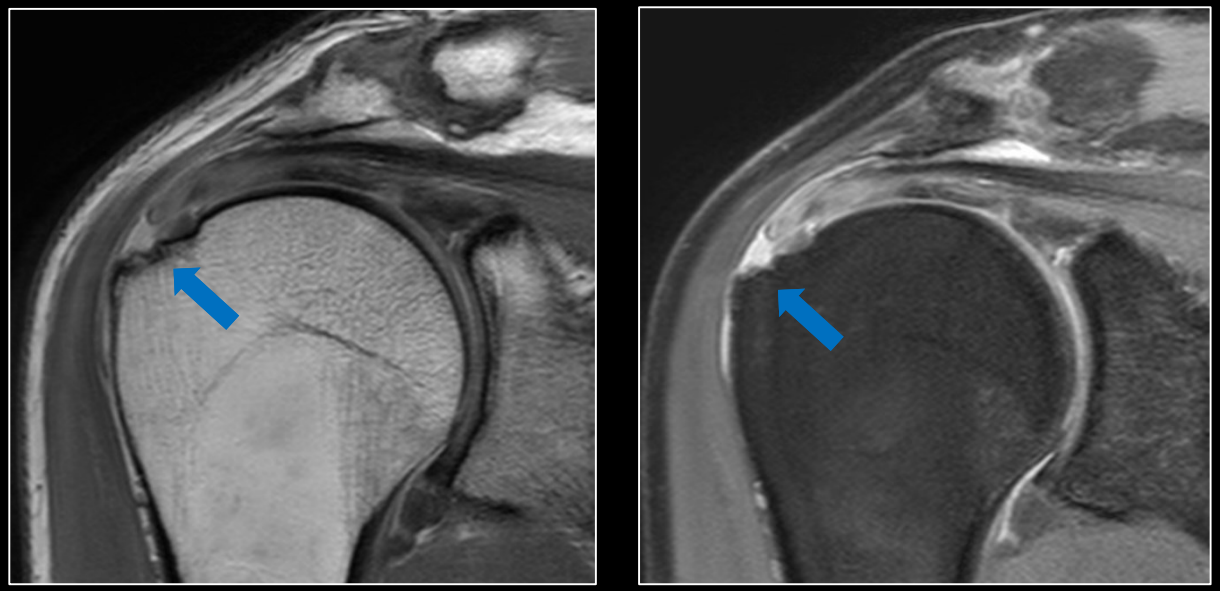


Imaging offers an anatomical “snapshot”, but in isolation is meaningless



Ask yourself: Why am I imaging this patient?

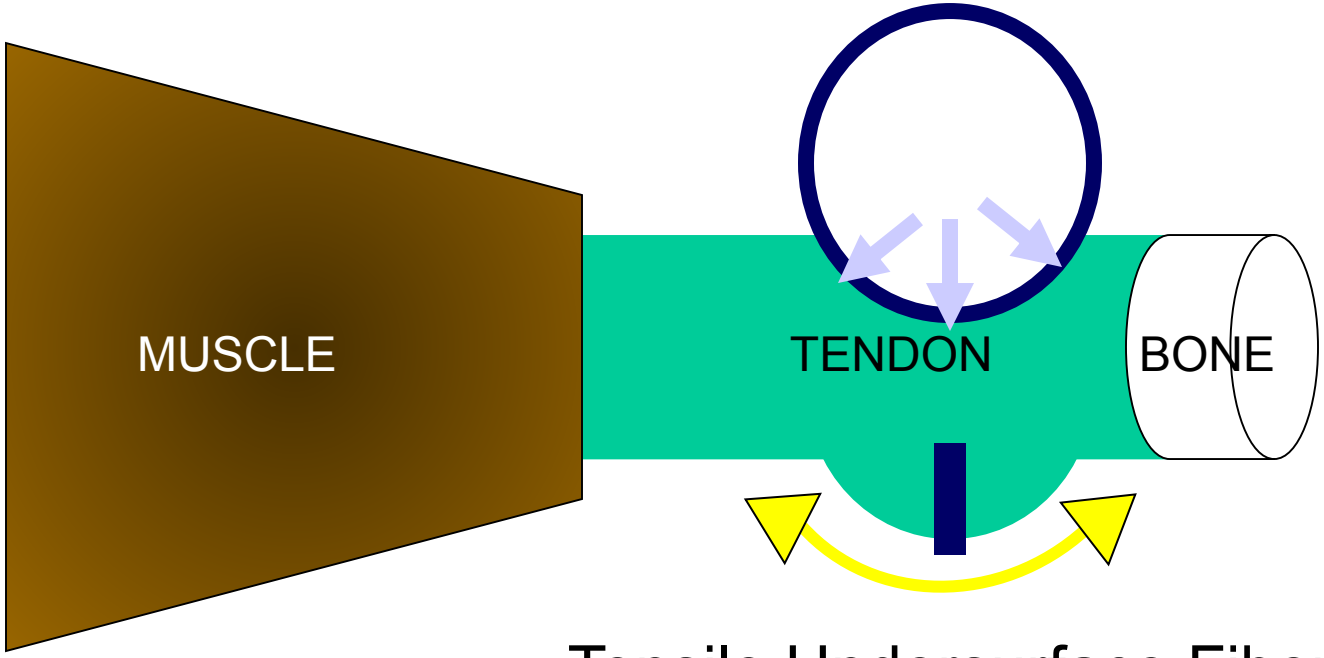
1. Diagnosis – No idea what is going on
2. Facilitate Management – Pretty good idea what is going on but want confirmation before implementing Rx plan
3. Patient expectation
4. End point of consultation/manage workload
5. Risk management – “cover my ass”



Common Shoulder problems

1. Impingement
2. Rotator Cuff Tears
3. Arthritis
4. Capsulitis
5. Trauma

Impingement



Tensile Undersurface Fiber Failure (TUFF)

AC arthrosis

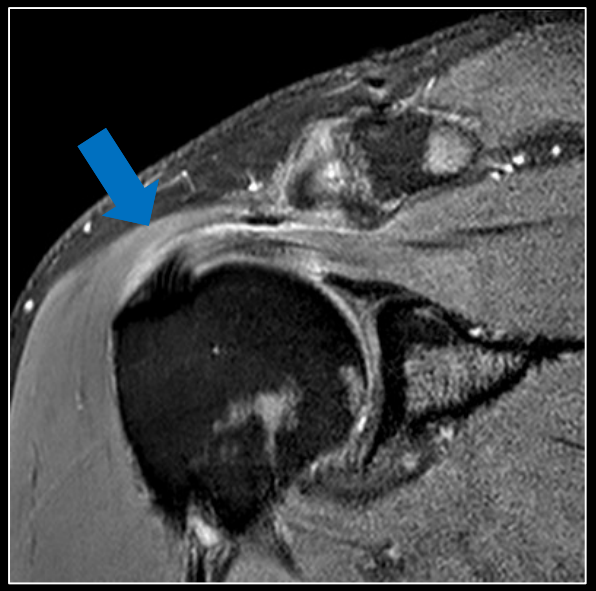
Hypertrophic bony change, capsular thickening, cystic change and bony oedmea

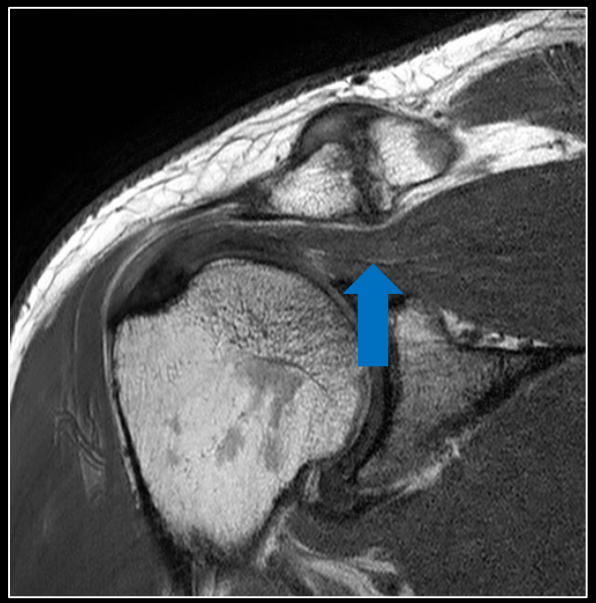
Indentation of the muclotendinous unction of SS

Chronic inflammation of the bursa

Bursal thickening and fluid collections

Dynamic ultrasound shows bunching



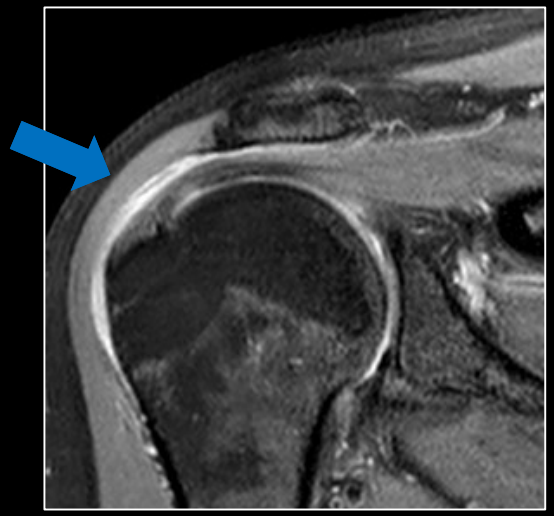


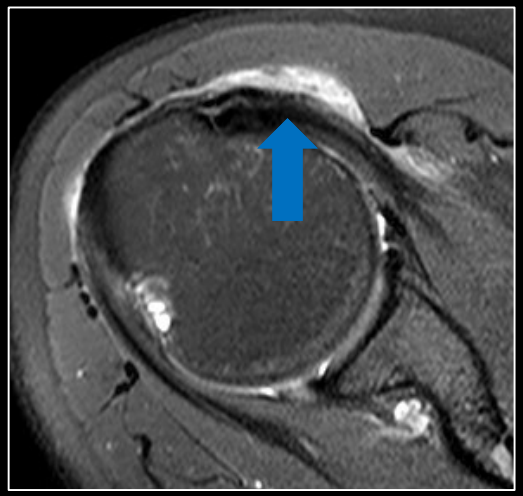
Role of imaging

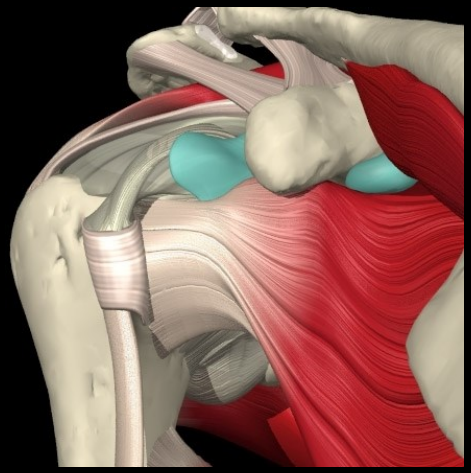
Exclude rotator cuff tear

Accurate guidance of injection

Impingement







Narrow subacromial space:

Bony hypertrophy of AC joint/CA ligament
Superior migration of humeral head
Tendon thickening
Inflammation of bursa
Fraying/tearing of the tendon

Impingement is a clinical diagnosis

Lots of people "impinge" but are asymptomatic
Pain generator might be AC joint

So what do I request for impingement?

Common Shoulder problems

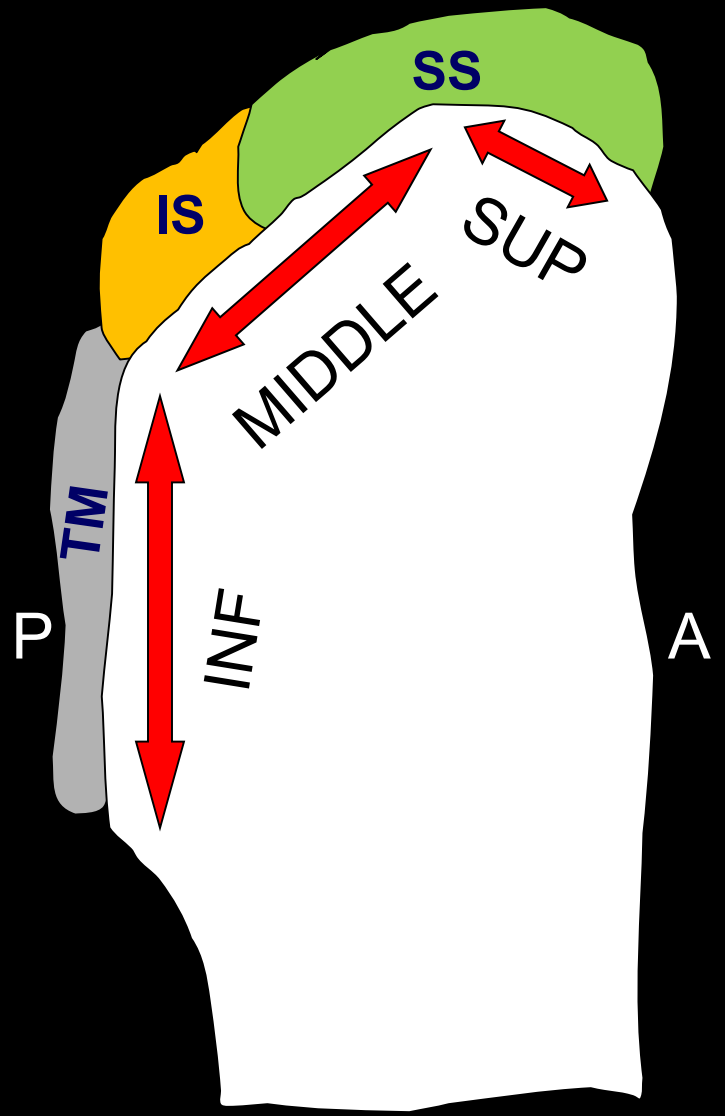
1. Impingement
2. Rotator Cuff Tears – US right?!
3. Arthritis
4. Capsulitis
5. Trauma

Greater Tuberosity Facets

Superior: Supraspinatus tendon

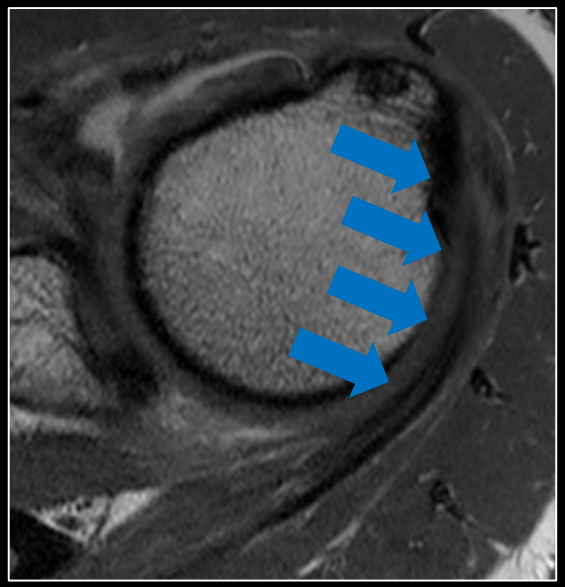
Middle: Supraspinatus and infraspinatus tendons

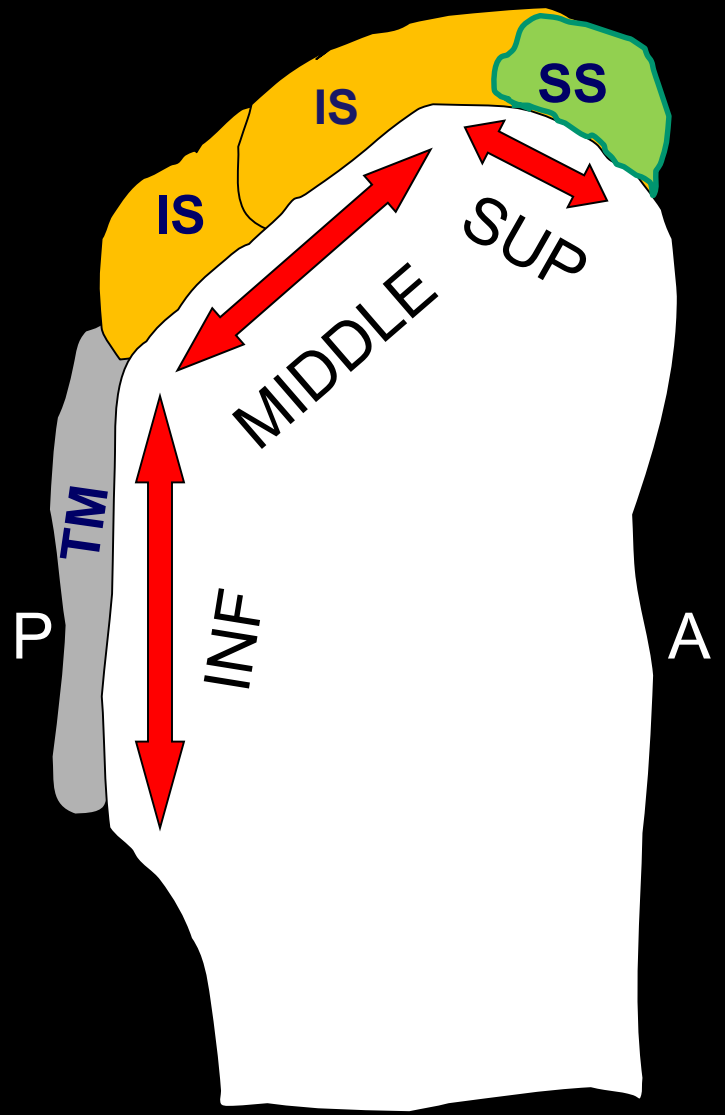
Inferior: Teres minor tendon



Greater Tuberosity Facets

Superior: Supraspinatus tendon
Middle: Infraspinatus tendons
Inferior: Teres minor tendon

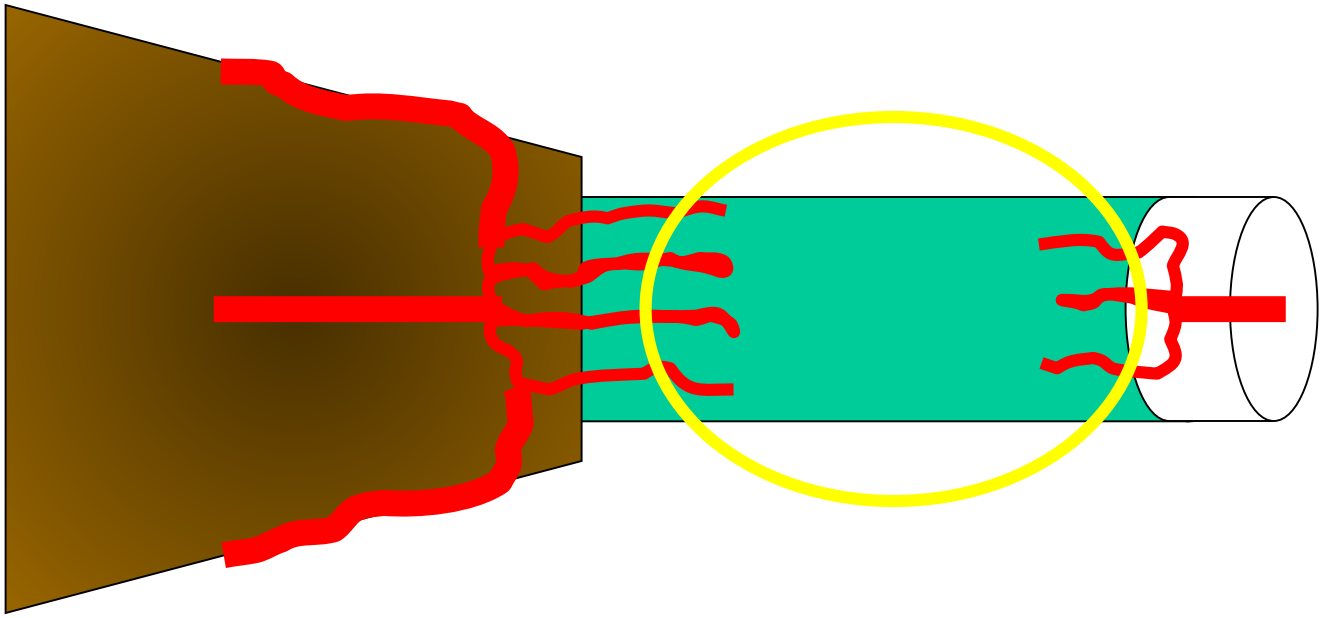




Mechanisms of Cuff Injury

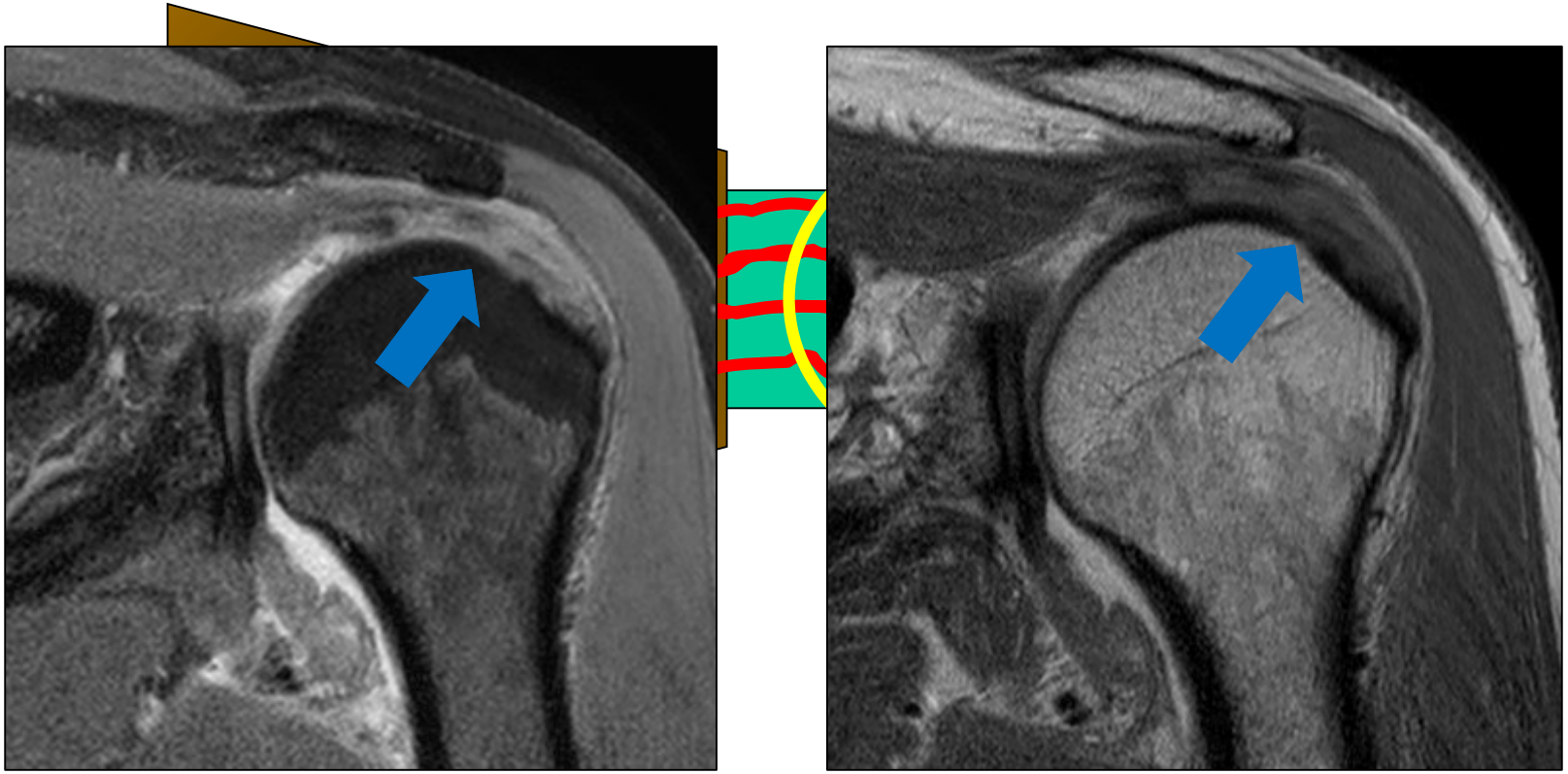
1. Impingement
2. Ischaemia
3. Intrinsic Structure
4. Degeneration
5. Trauma

Ischaemia



In some tendons, such as the supraspinatus tendon, normal avascular regions **(critical zones)** may bevulnerable to degeneration and subsequent failure

Ischaemia



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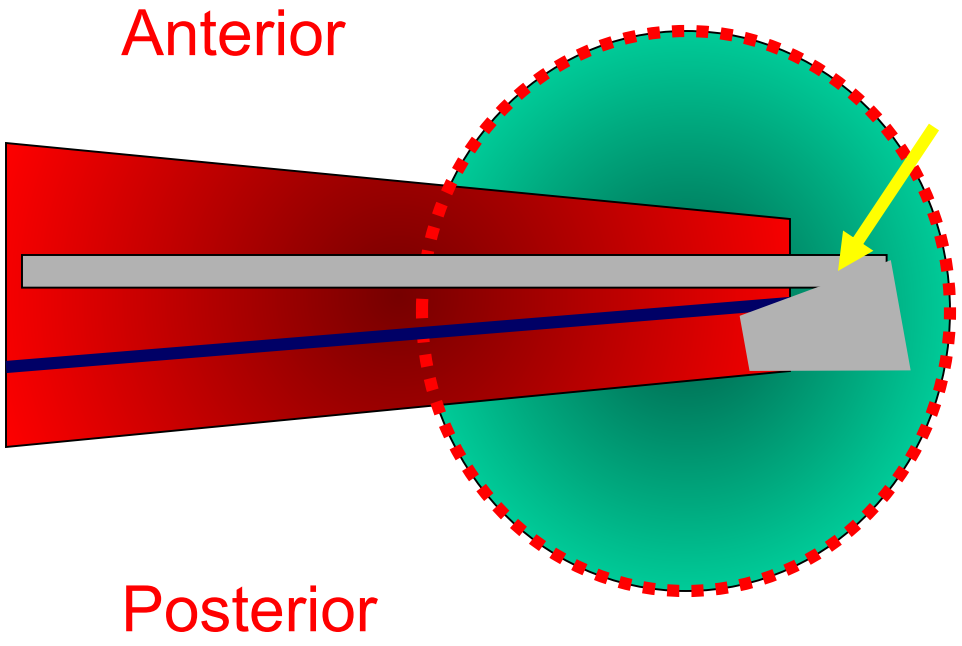
Intrinsic Structure



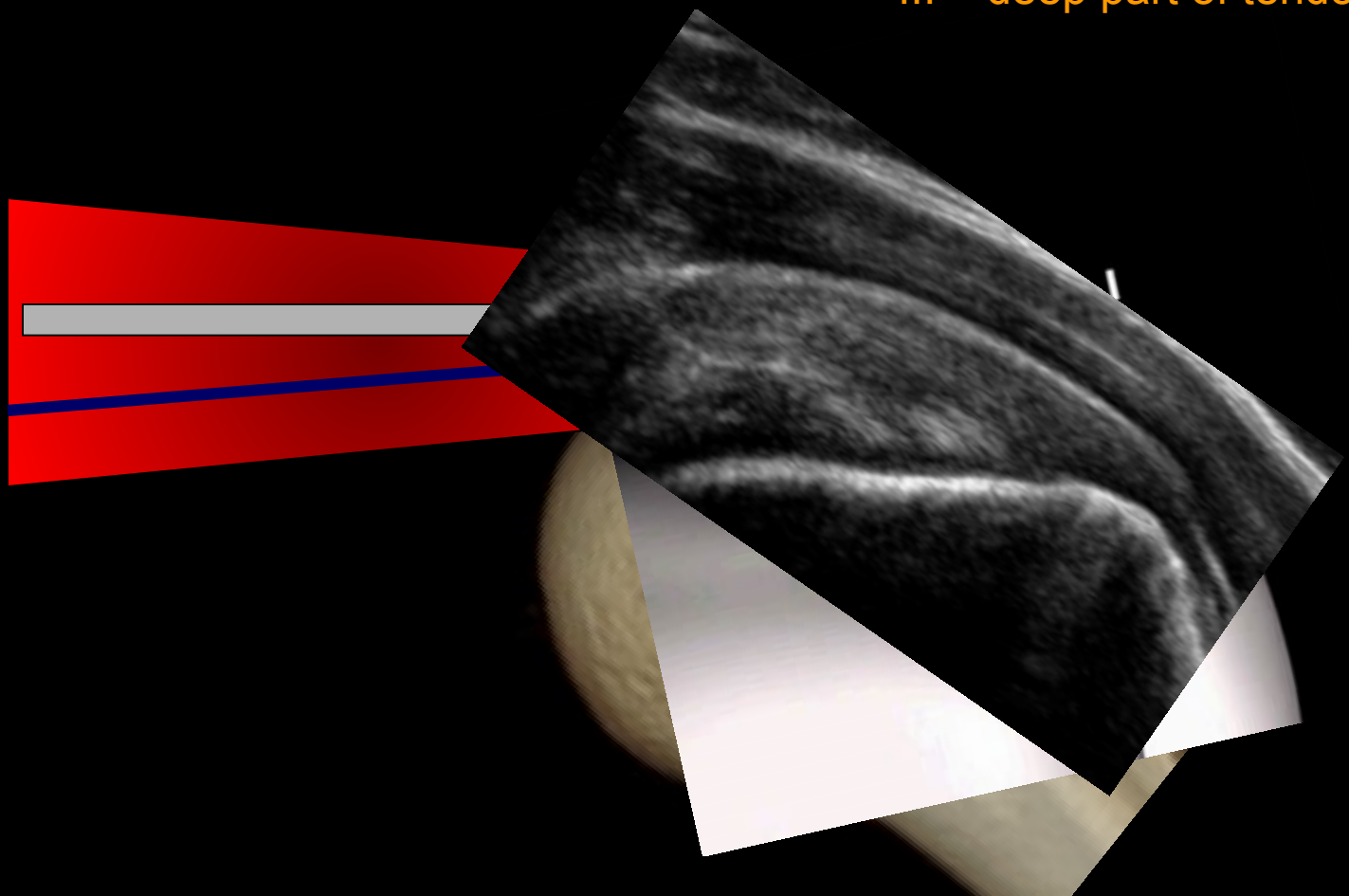
Supraspinatus muscle consists of 2 muscle bellies:

1. Anterior belly:
   Larger with central tendon
2. Posterior belly:
   Straplike with terminal tendon

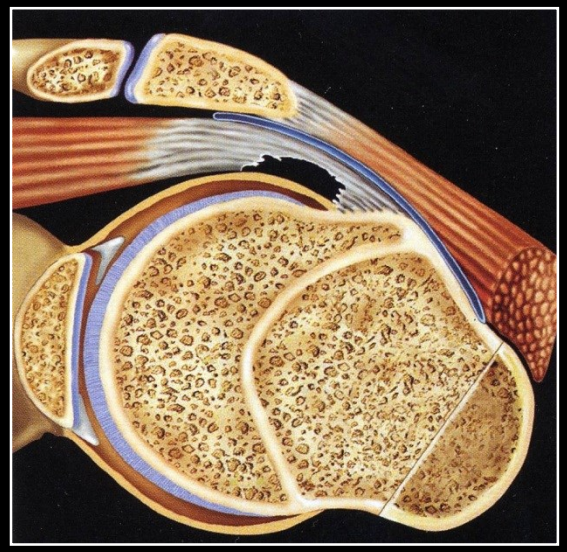
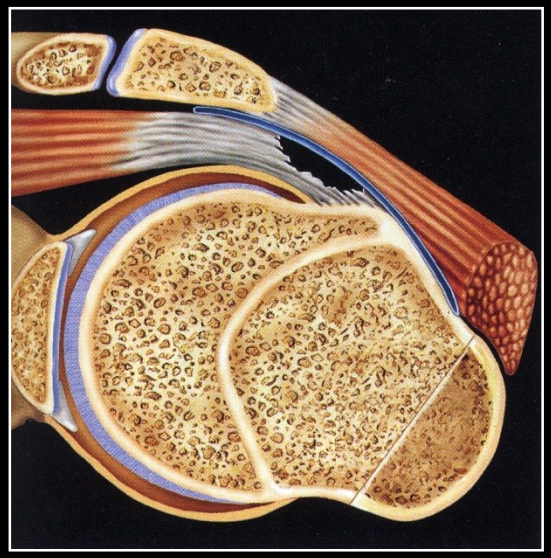
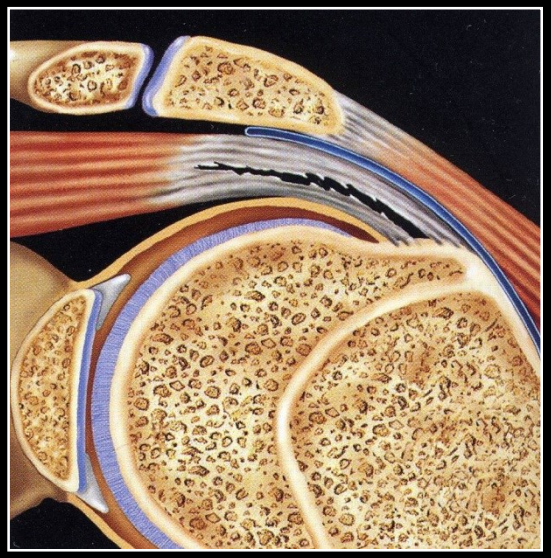
Intrinsic Structure

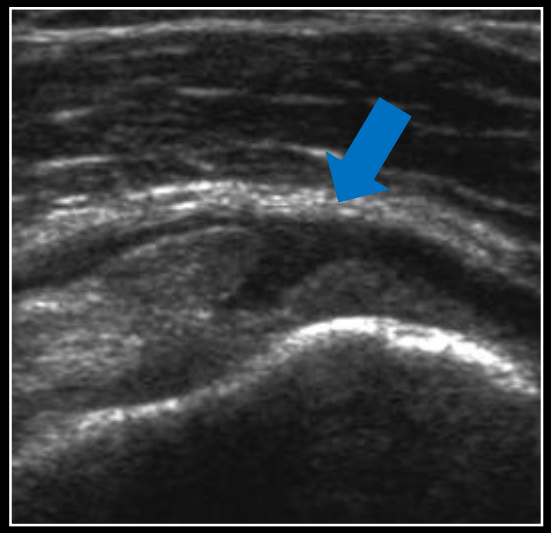
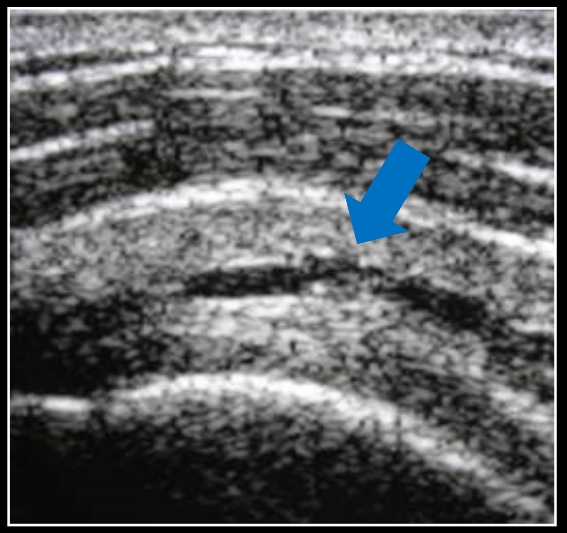
Clark's Layers

II - superficial part of tendon
III – deep part of tendon



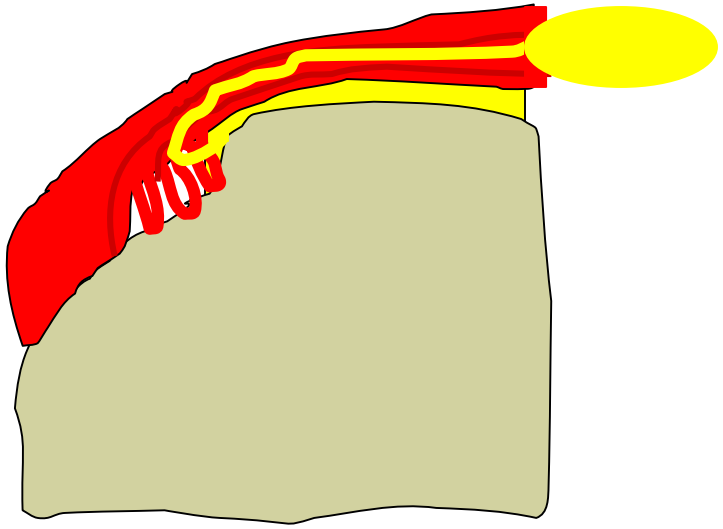
Partial Tears Rotator Cuff

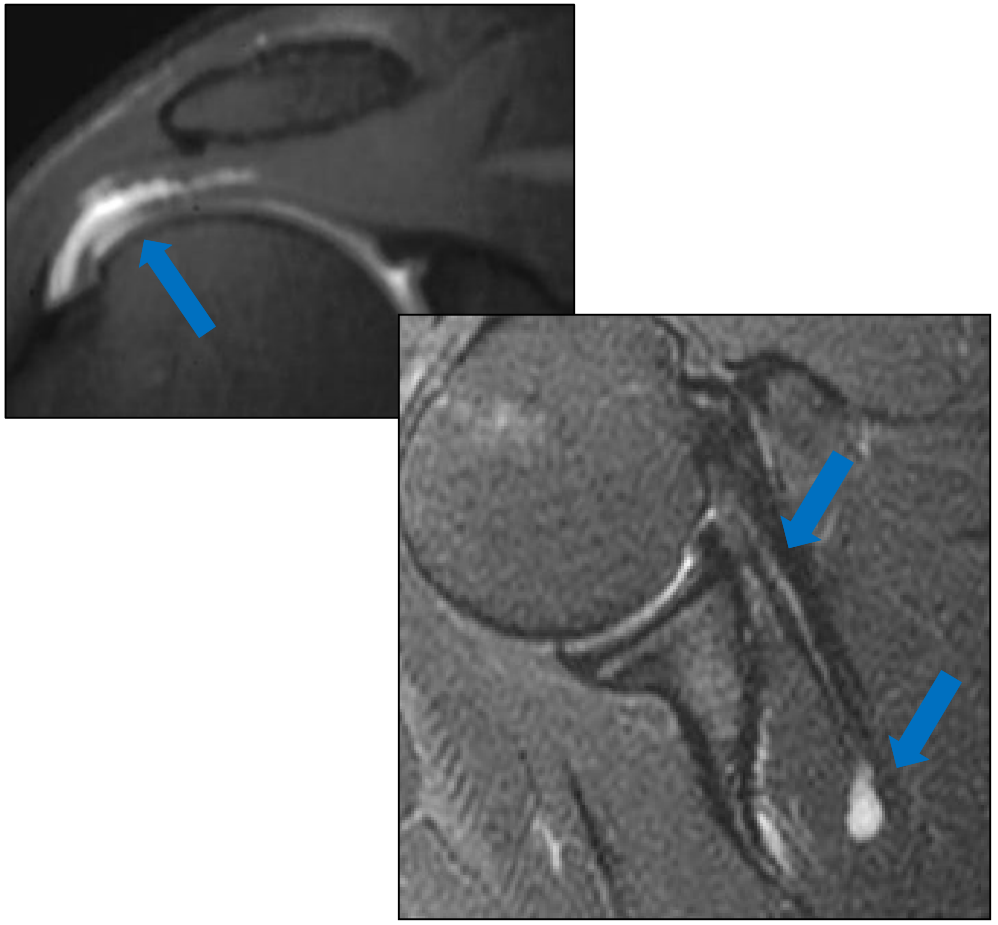




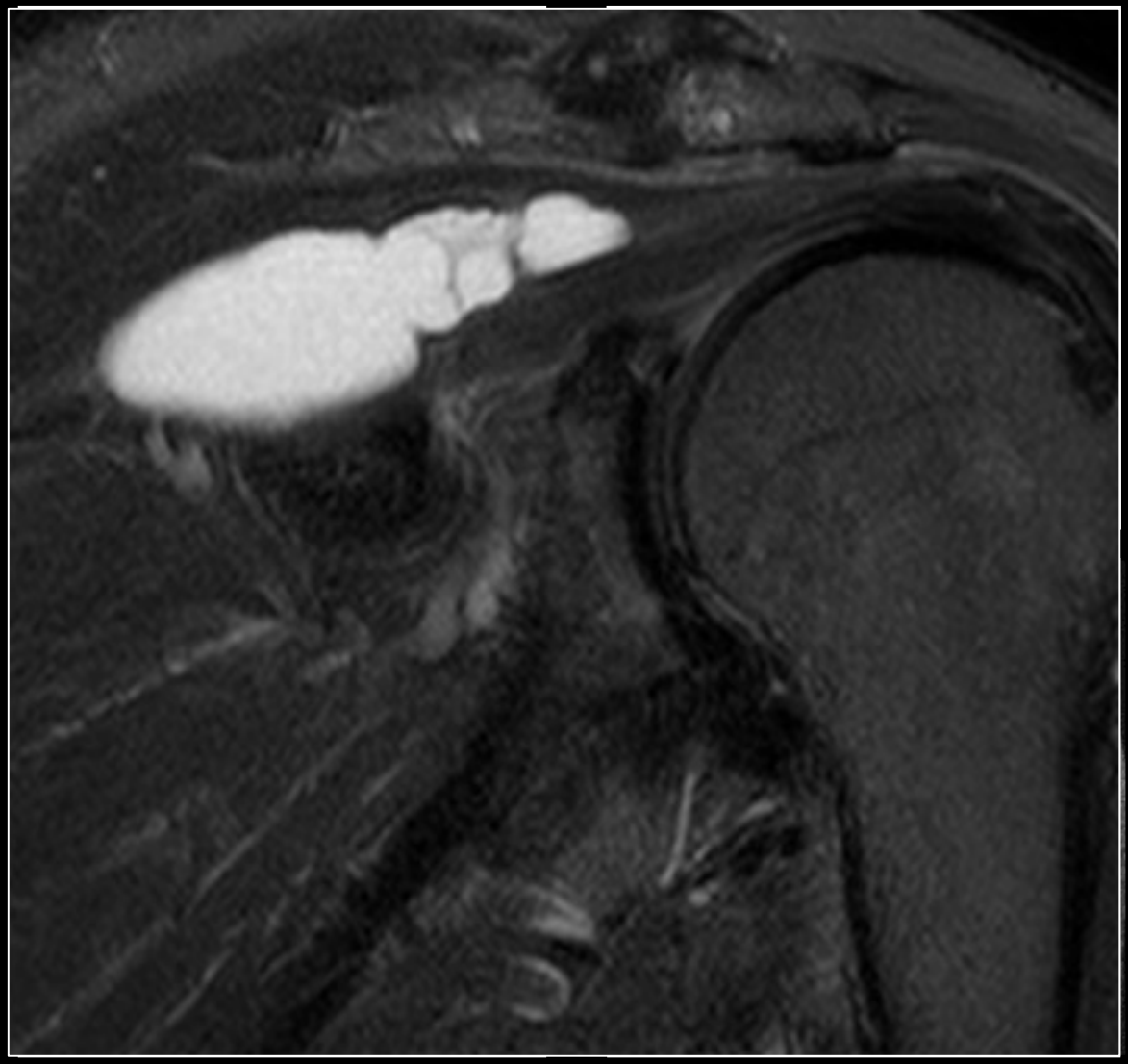
Delaminating Tears

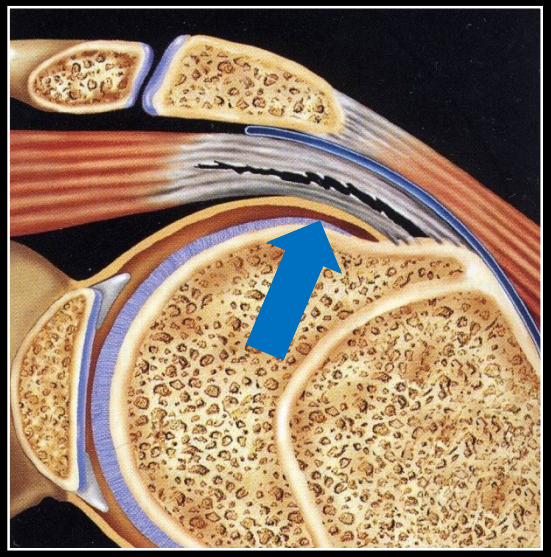
In the presence of a joint effusion, delaminated tears that violate the articular surface may be accompanied by **sentinel cysts** at the myotendinous junction

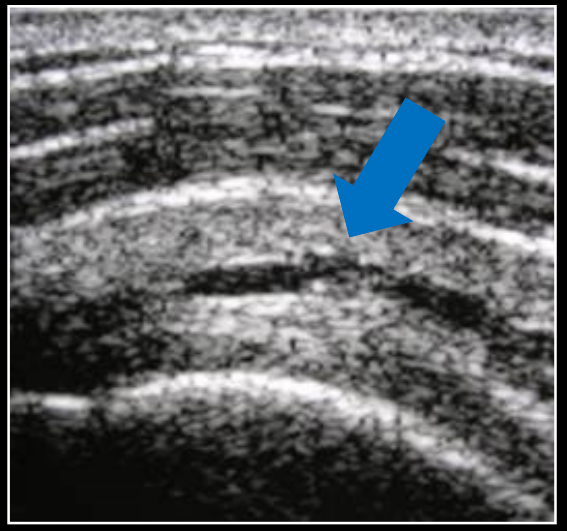




Delaminating Tears Rotator Cuff







Rotator Cuff Tears

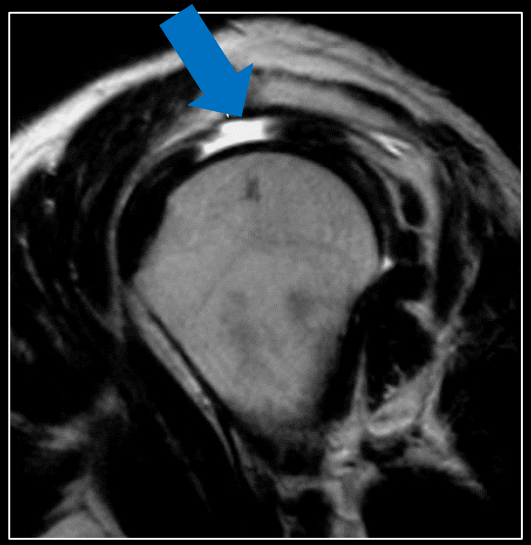
What does the surgeon want to know?

Tendon torn or not? Dimensions of tear
Tendon edge morphology
Preexisting tendon path
Other: ?AC arthrosis ? Glenouhumeral OA ?Gr Tuberosity ?Capsulitis

Rotator Cuff Failure

Chronic Massive Tears:

Progressive tendon failure with retraction
Tendon not seen with ultrasound
Superior humeral migration
Muscle fatty infiltration ?surgical repair
Compensation by other muscles ?teres minor



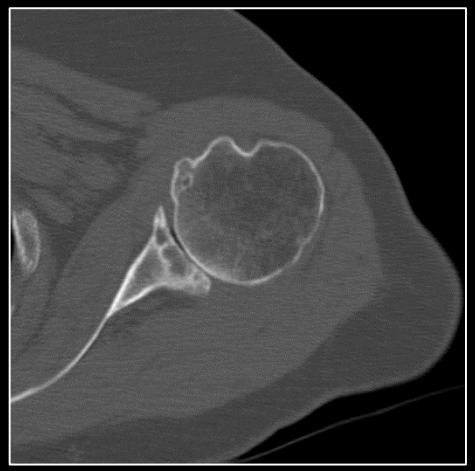
So what do I ask for ?rotator cuff tear

What is the role of shoulder ultrasound?

Common Shoulder problems

1. Impingement
2. Rotator Cuff Tears
3. Arthritis - radiographs
4. Capsulitis
5. Trauma

Osteoarthritis



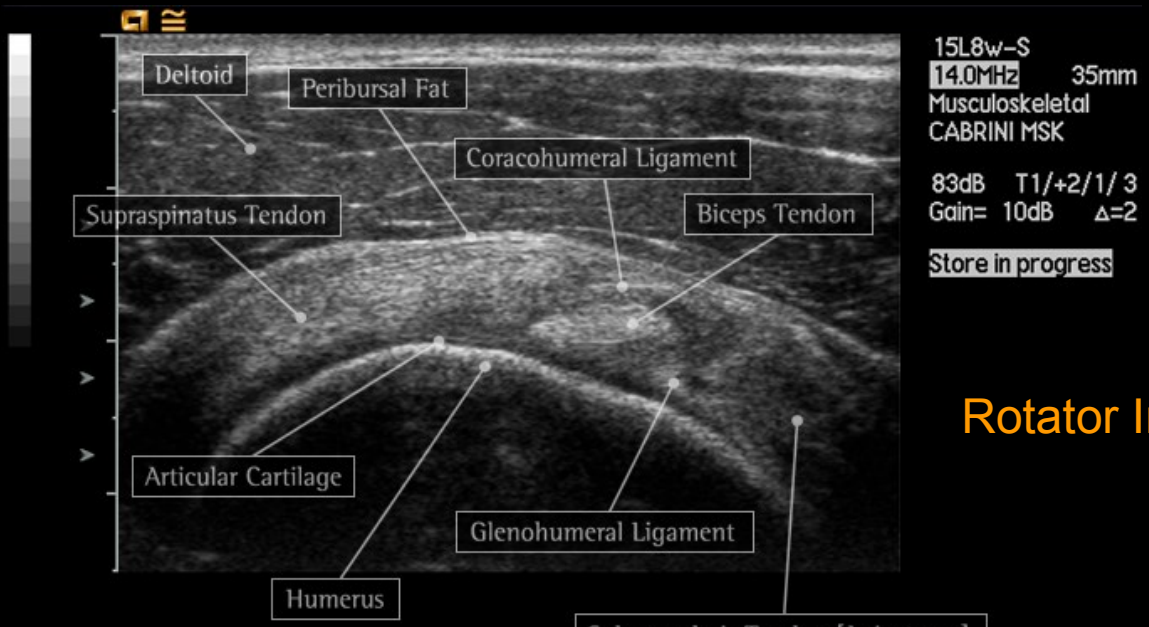
Clinically obvious in many cases
Radiographs confirm diagnosis +/-severity
MRI can be useful for early OA +/- intraarticular bodies
Surgeons sometimes order CT scans for surgical planning/prosthesis

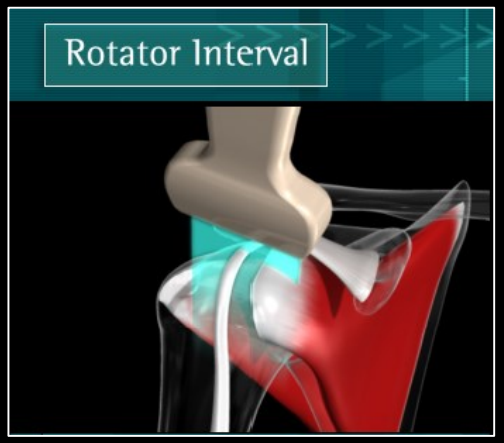
Problem: OA often does not occur in isolation

Common Shoulder problems

1. Impingement
2. Rotator Cuff Tears
3. Arthritis
4. Capsulitis - MRI
5. Trauma

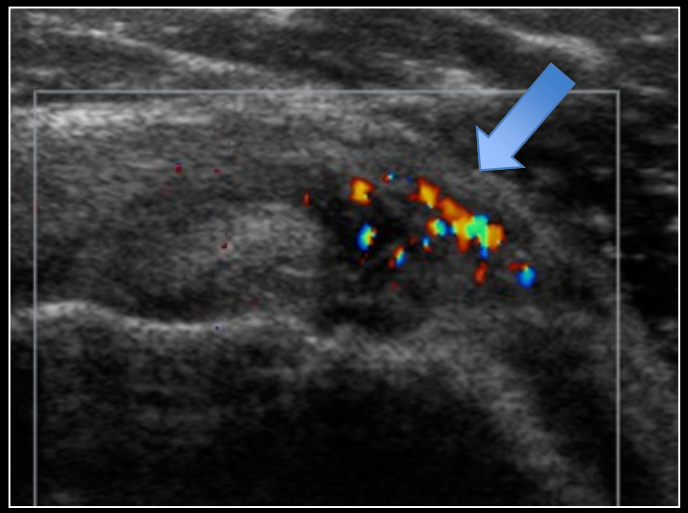
Capsulitis





Rotator Interval Space

Subscapularis Tendon [Anisotropy]



Common Shoulder problems

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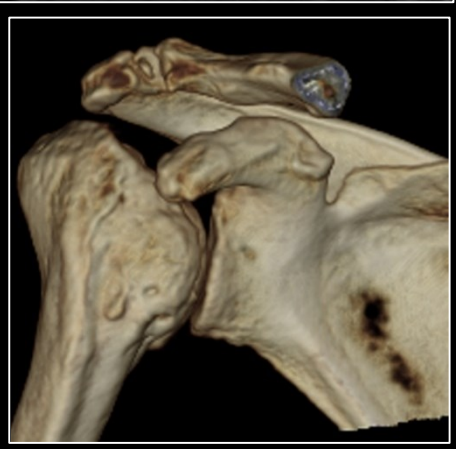
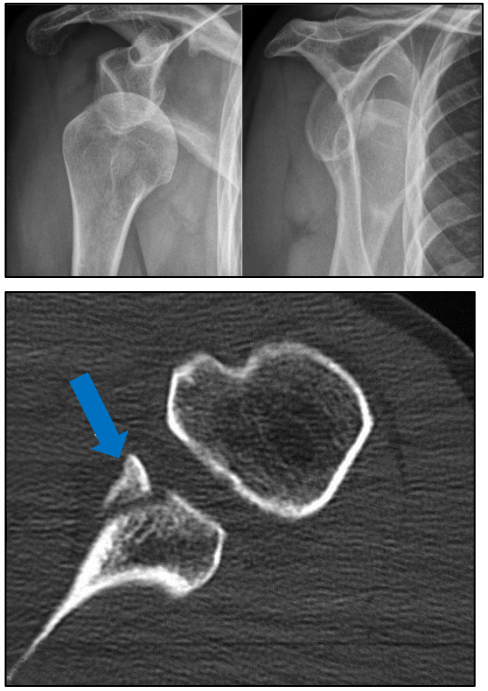
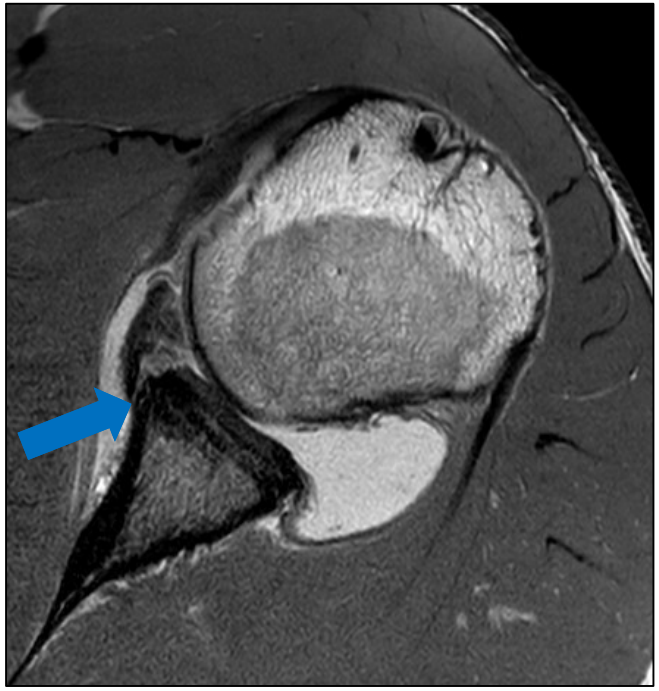
Trauma

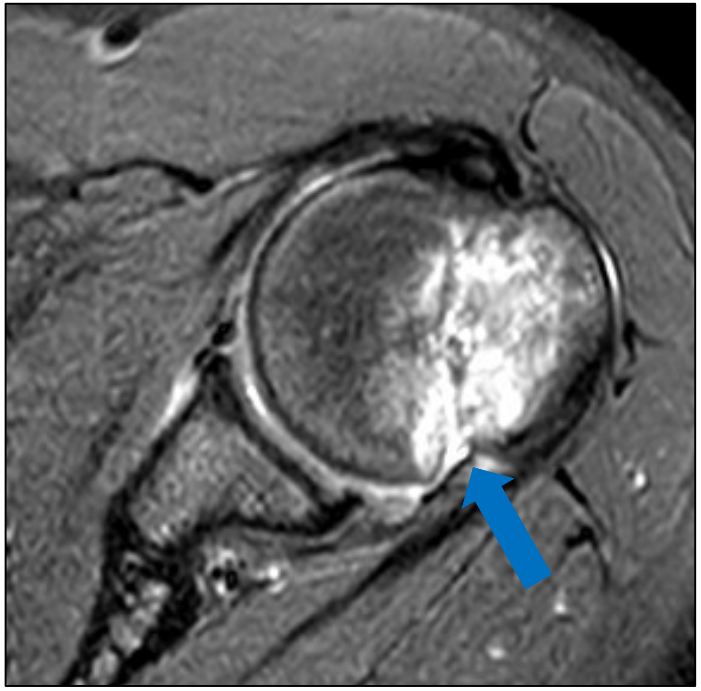
Bone Trauma – radiographs +/- CT
Soft tissue Trauma – radiographs +/- MRI



Shoulder Dislocation

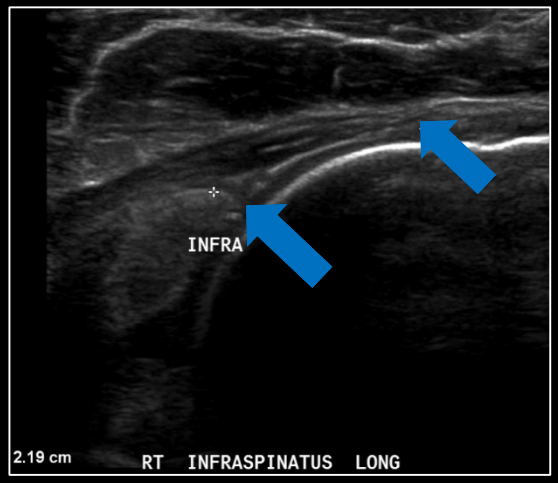






MRI best test for assessing labral-capsular-ligament complex
Also chondral insult, bone bruise

Soft Tissue Trauma

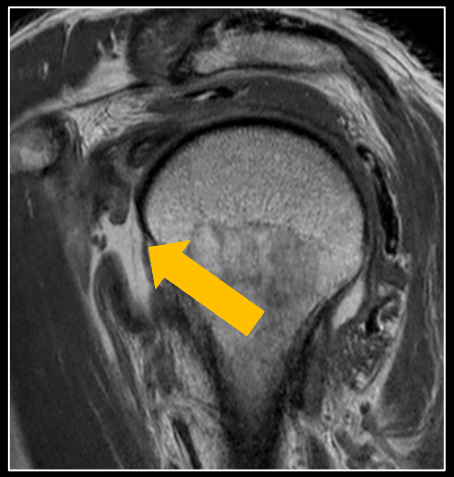


Case Study :
23yo professional AFL player tackled by pulling his arm across his body

Infraspinatus rupture

Case Study:
27yo rugby player with tackling injury

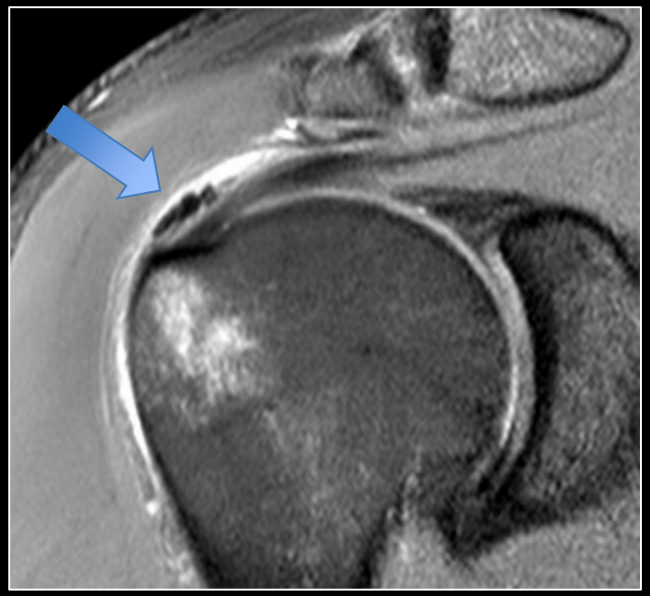
Subscapularis rupture



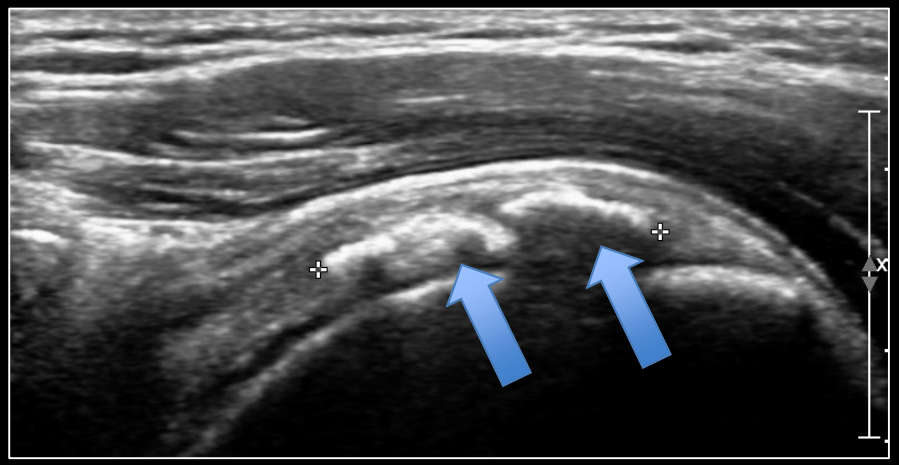
Common Shoulder problems

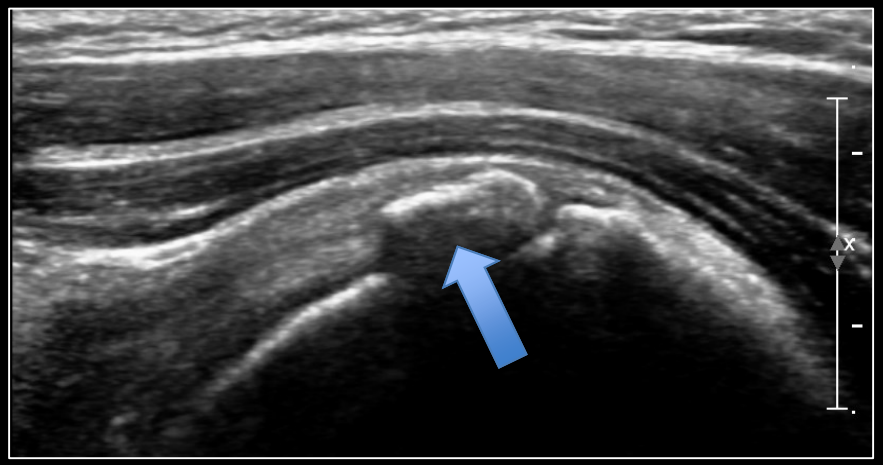
What about Ultrasound???

Calcific Tendonitis



Ax unknown
Crystals migrate into bursa
Secondary bursitis
Often self-limiting
US most sensitive





Common Shoulder problems

Ultrasound is fantastic for injections, aspirations and biopsies

Ancillary information/dynamic scanning

Shoulder specialists prefer MRI

Imaging Shoulder problems





What can Imaging tell us?

David Connell FRANZCR , FFSEM (UK)

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Imaging @ Olympic Park

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