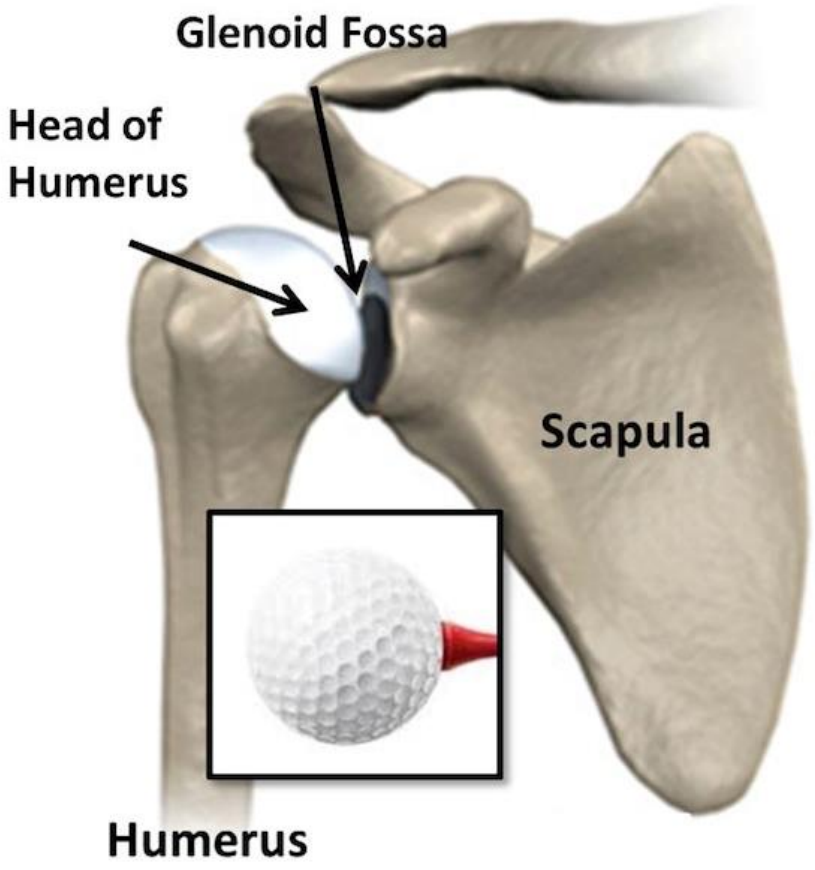
Shoulder anatomy and clinical assessment of the shoulder

Shoulder anatomy

- Highly mobile joint where stability has been sacrificed for mobility.

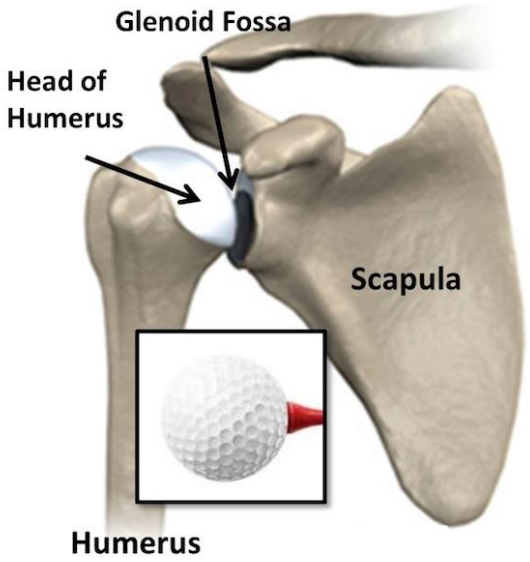
- Shoulder girdle comprises:
  - Glenohumeral (ball and socket) joint
  - Acromio-clavicular joint
  - Scapula sitting on thoracic wall / rib cage (“floating” joint)

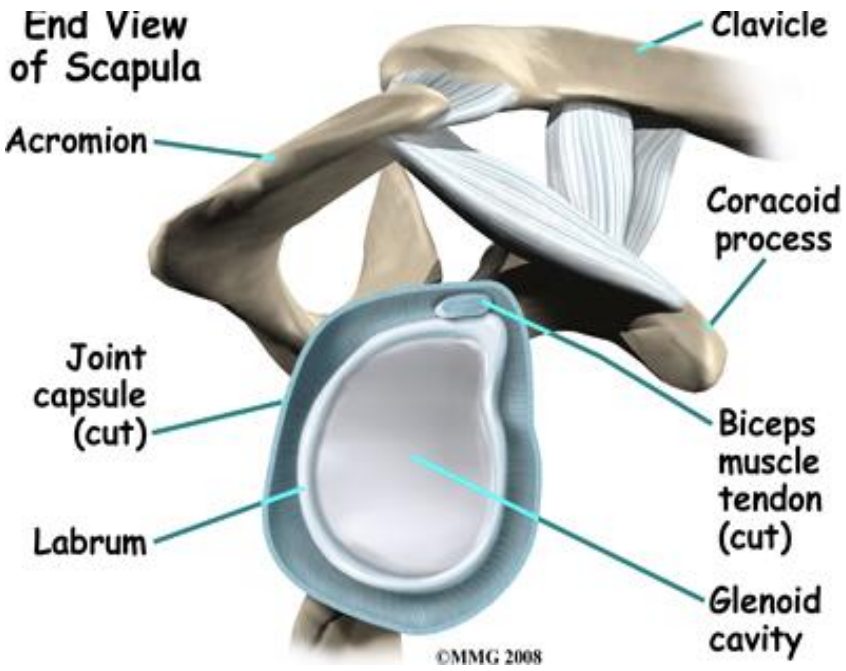
Glenohumeral (ball and socket) joint



Courtesy Nicki Delves

Glenohumeral (ball and socket) joint





Courtesy Nicki Delves

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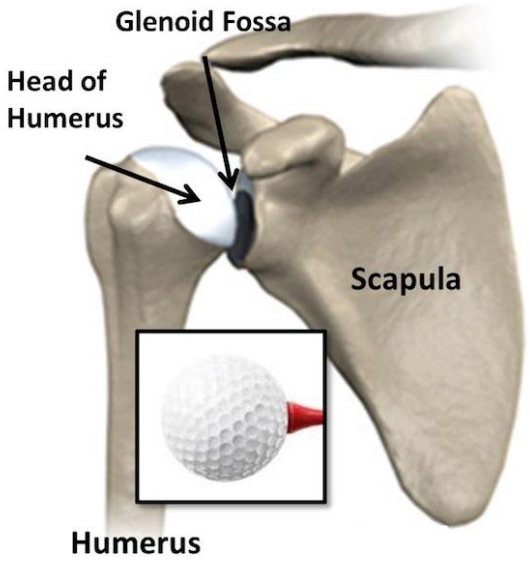
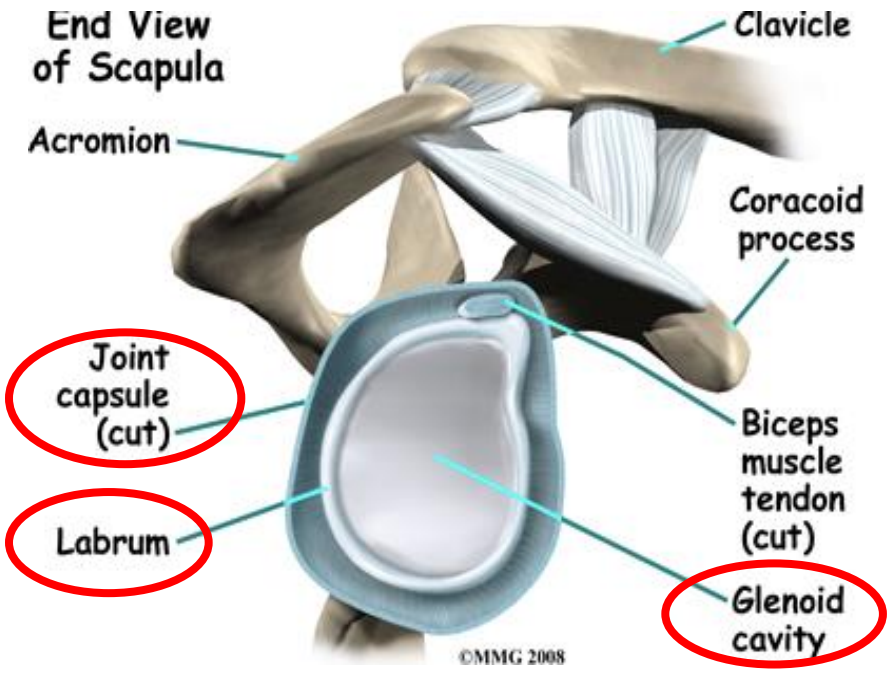
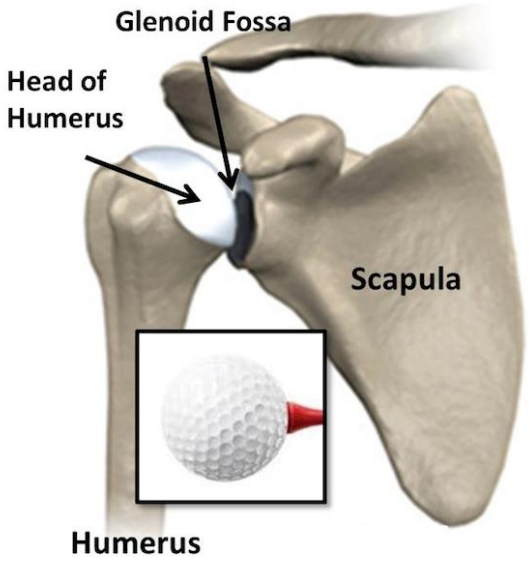
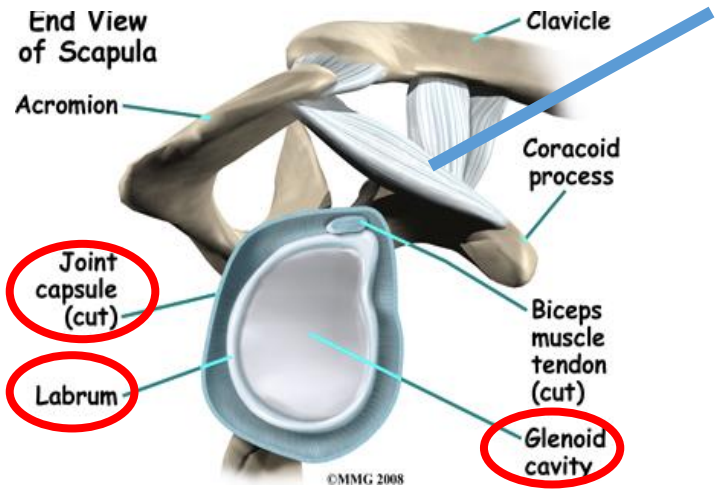




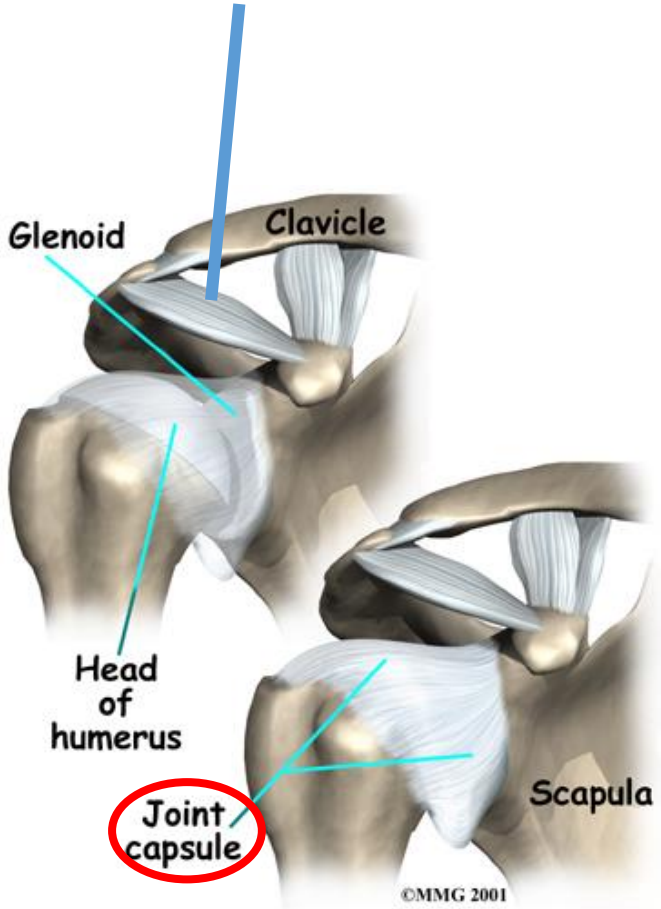
Courtesy Nicki Delves

Glenohumeral (ball and socket) joint





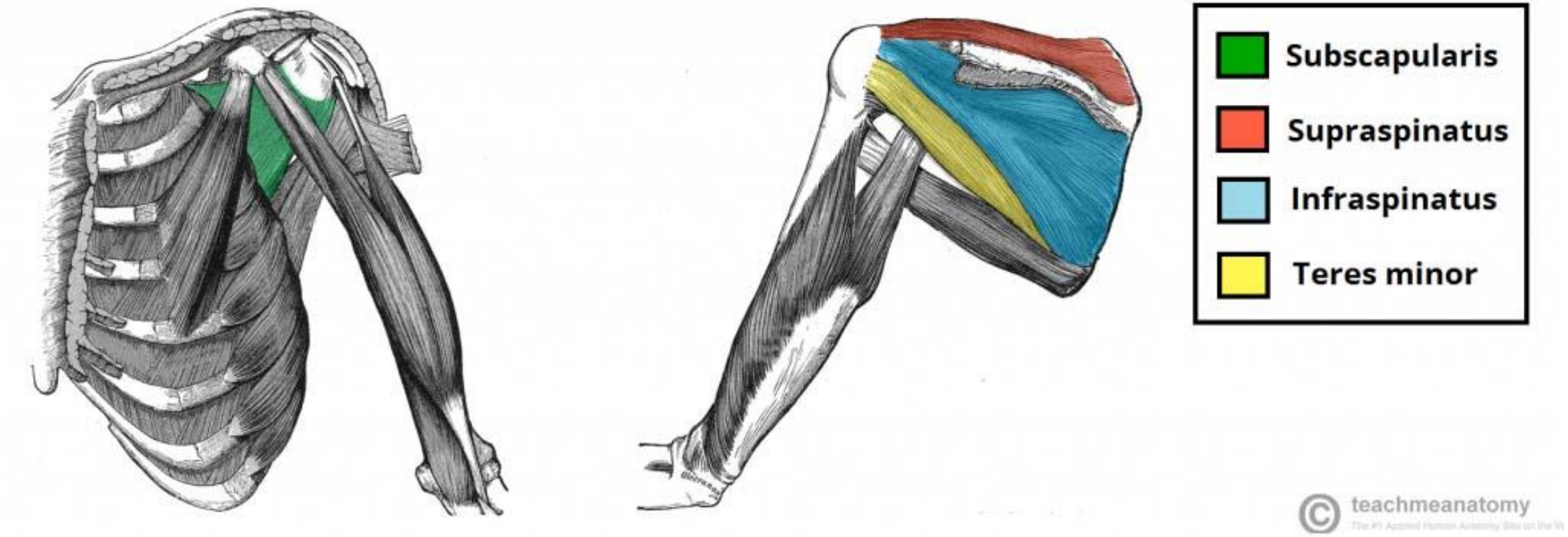
Coraco-acromial ligament (CAL)



Courtesy Nicki Delves

Glenohumeral (ball and socket) joint

- Rotator Cuff muscles



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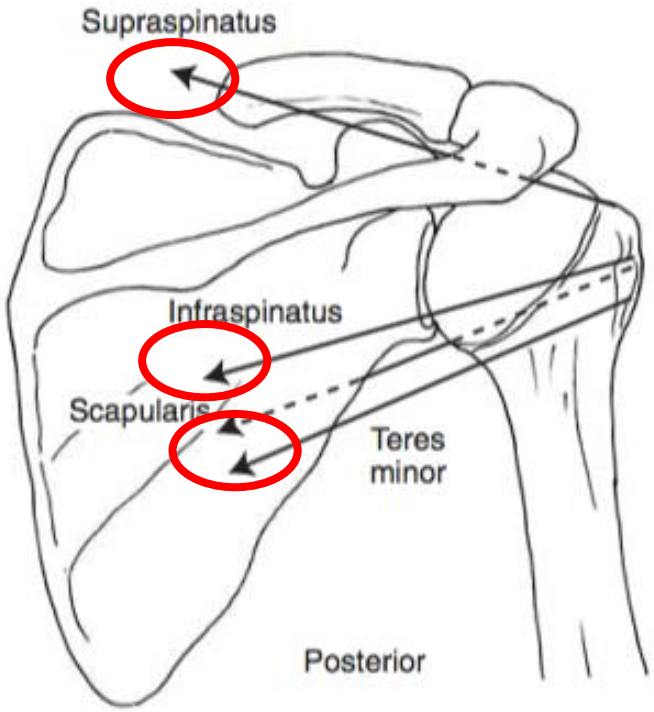
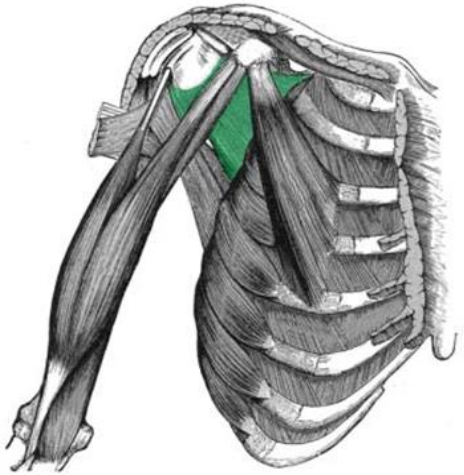


▲ **Figure 7-36** ■ The action line of the four segments of the rotator cuff: the supraspinatus, infraspinatus, teres minor, and subscapularis muscles.

Courtesy Dr Kai Win

Subscapularis



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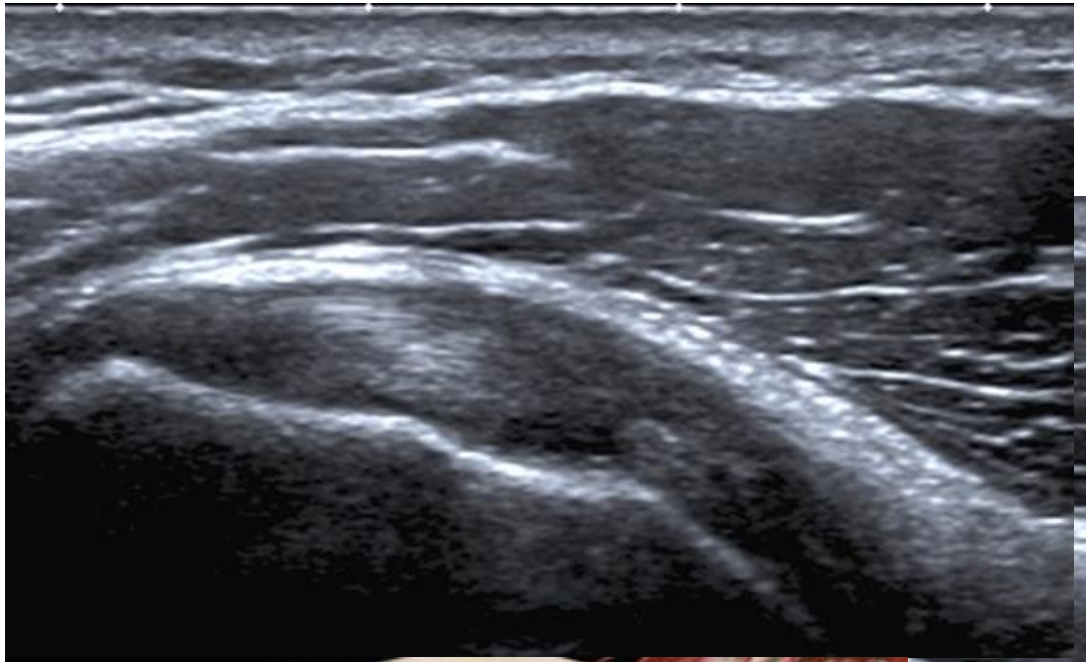

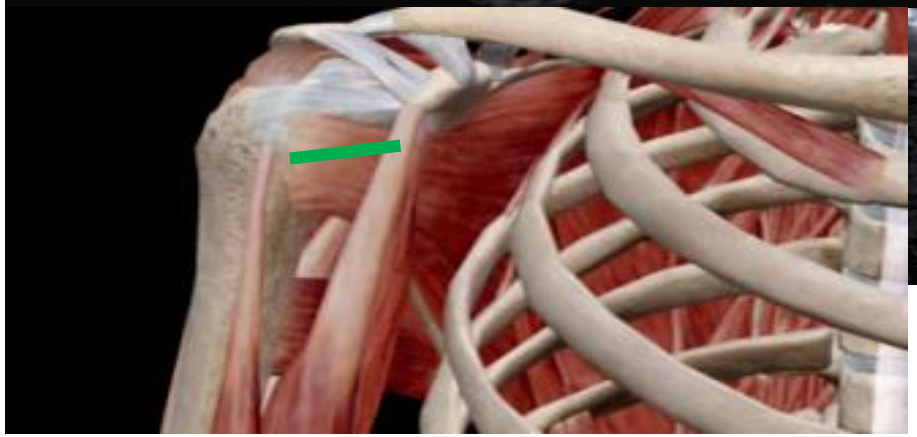

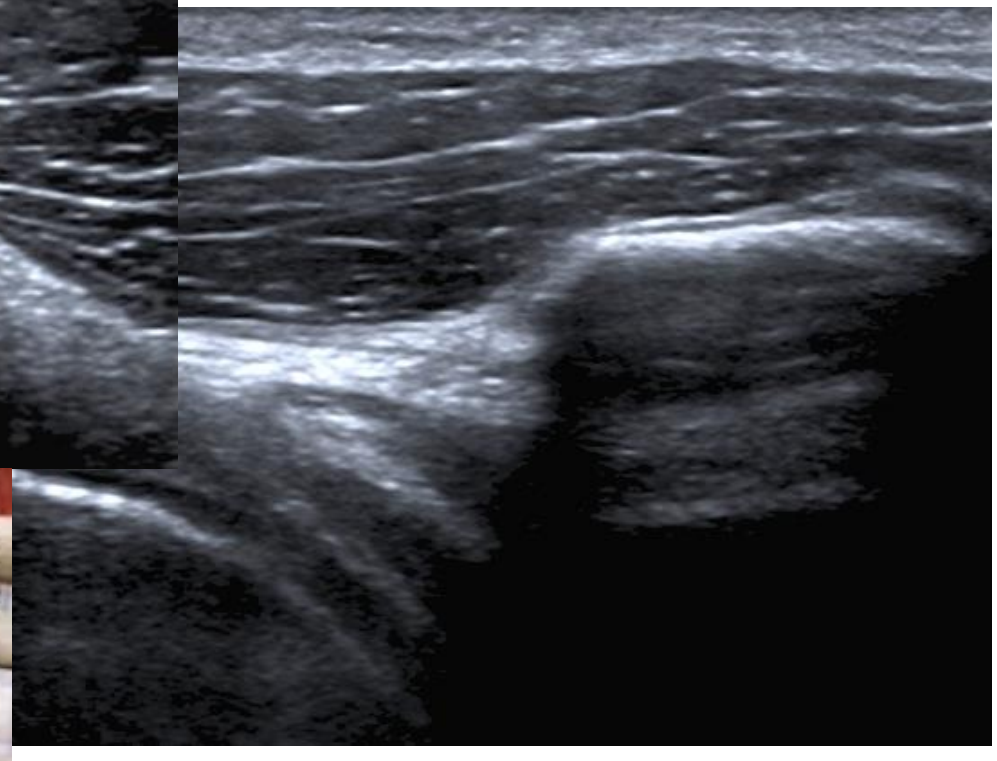

Courtesy Nicki Delves

Supraspinatus

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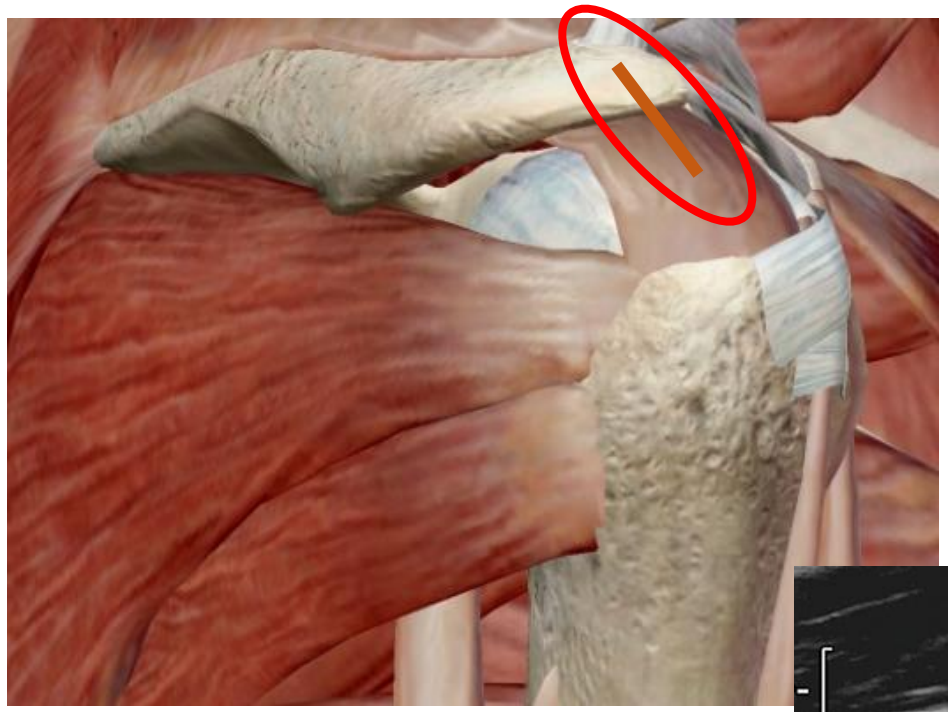

Infraspinatus

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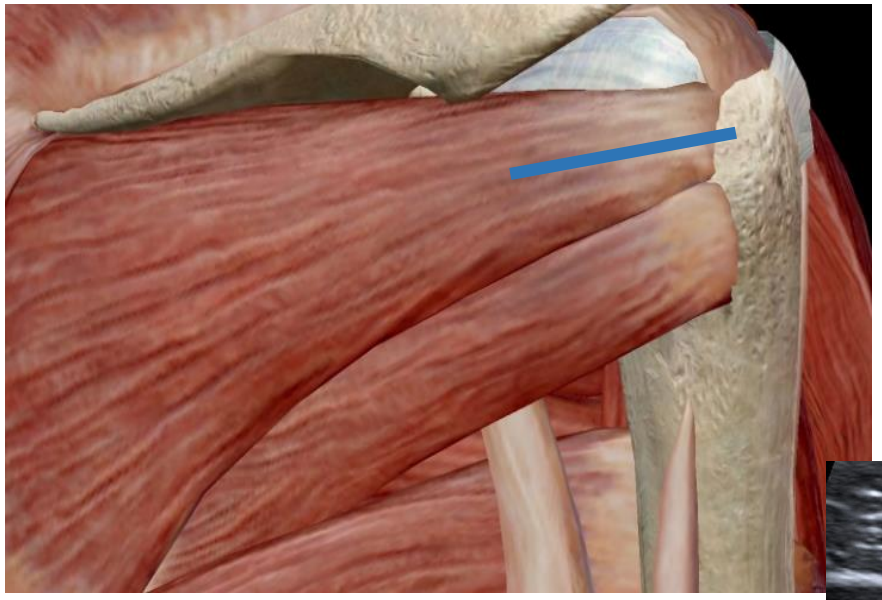
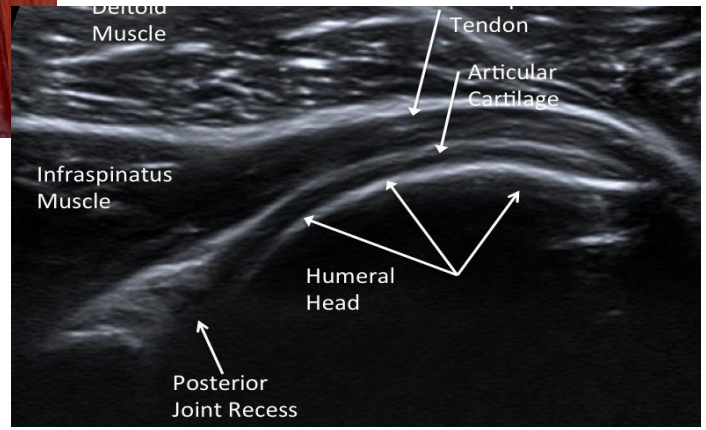
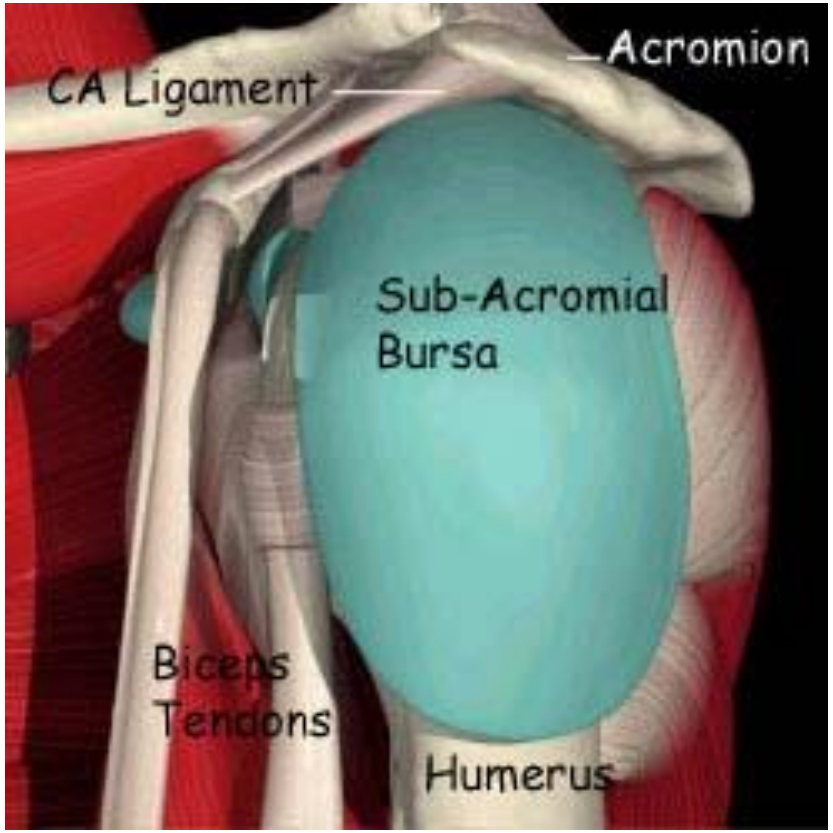


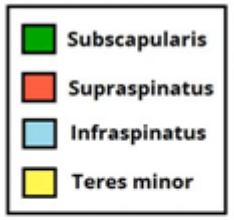


Bursae



Courtesy Kate Norris & Nikki Meredith

Rotator cuff tendons



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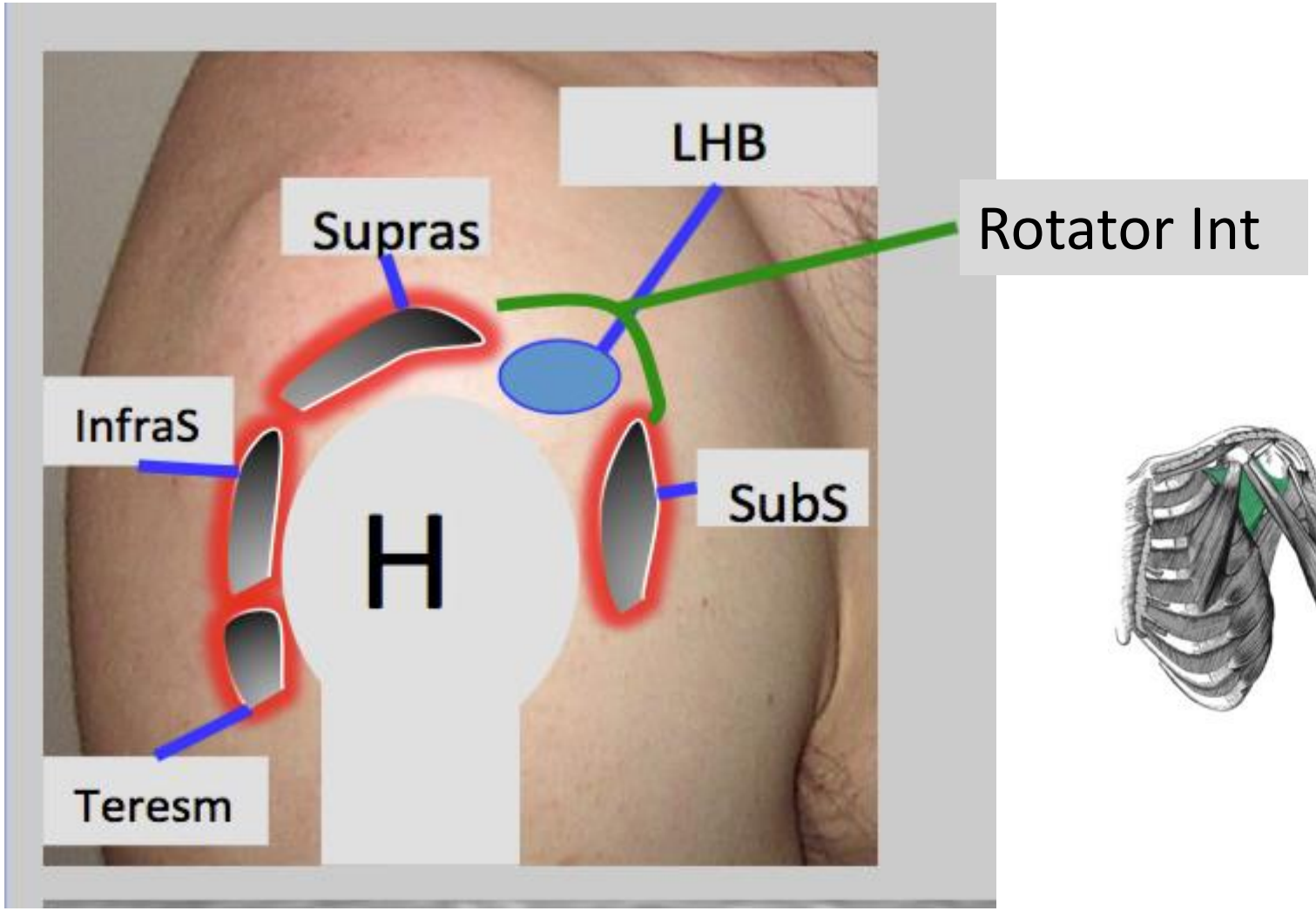
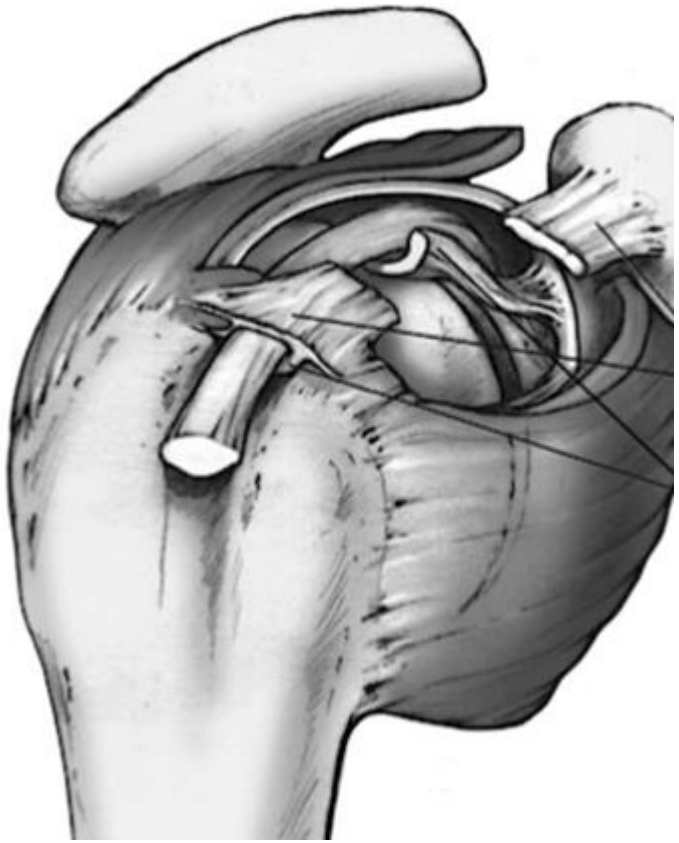


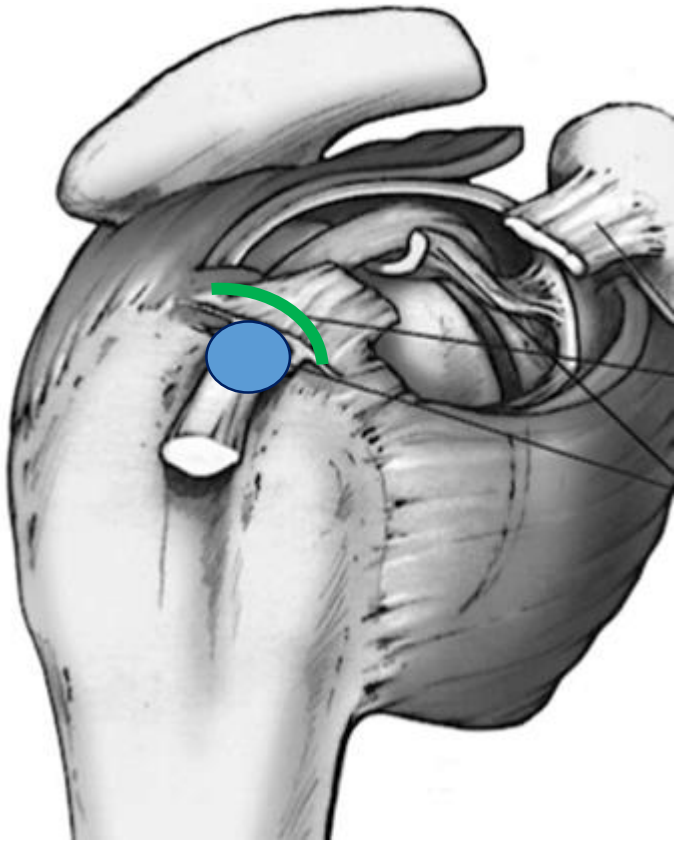
Courtesy Nicki Delves

Biceps tendon in rotator interval



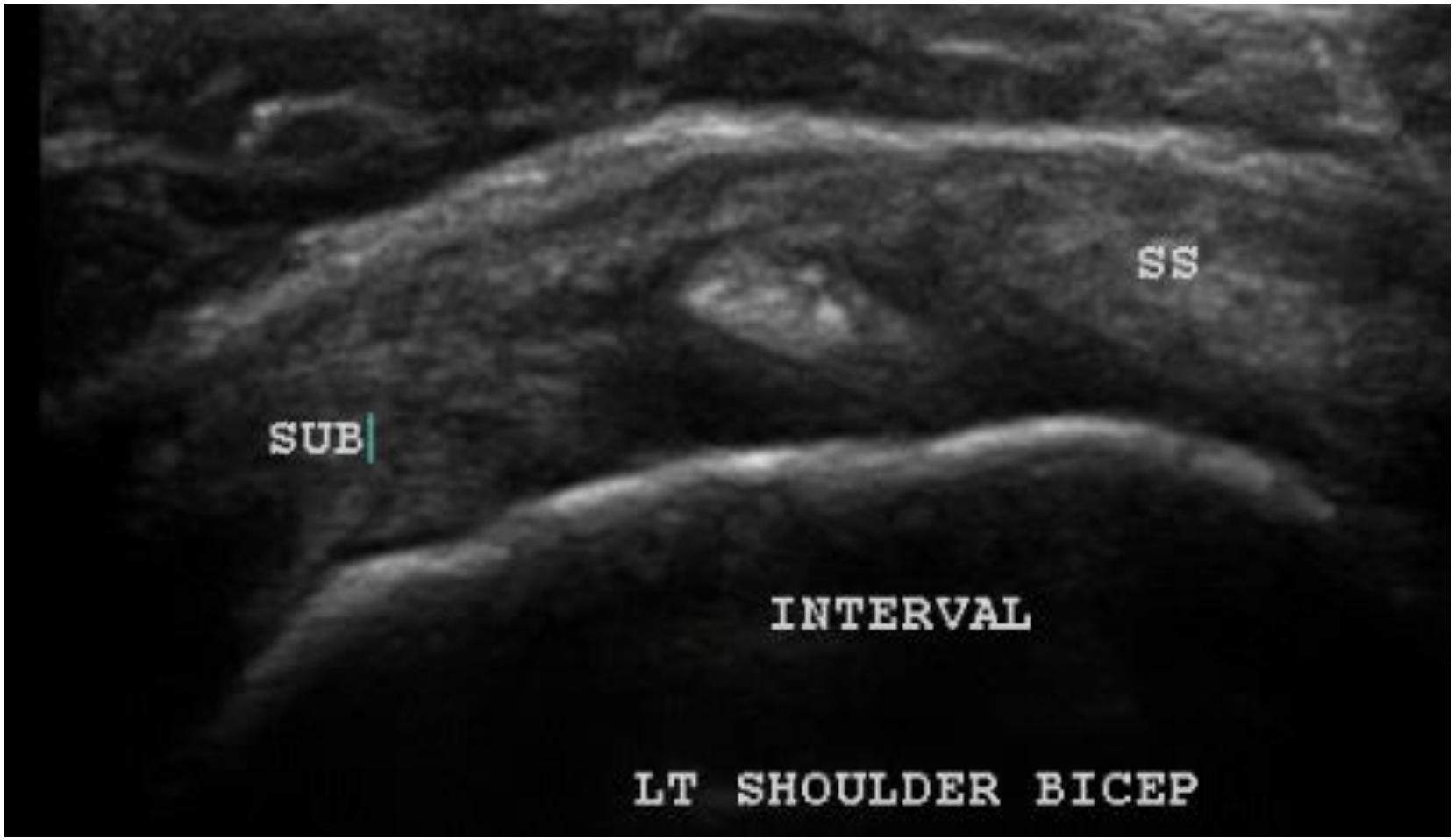
Courtesy Nicki Delves

Biceps tendon in rotator interval



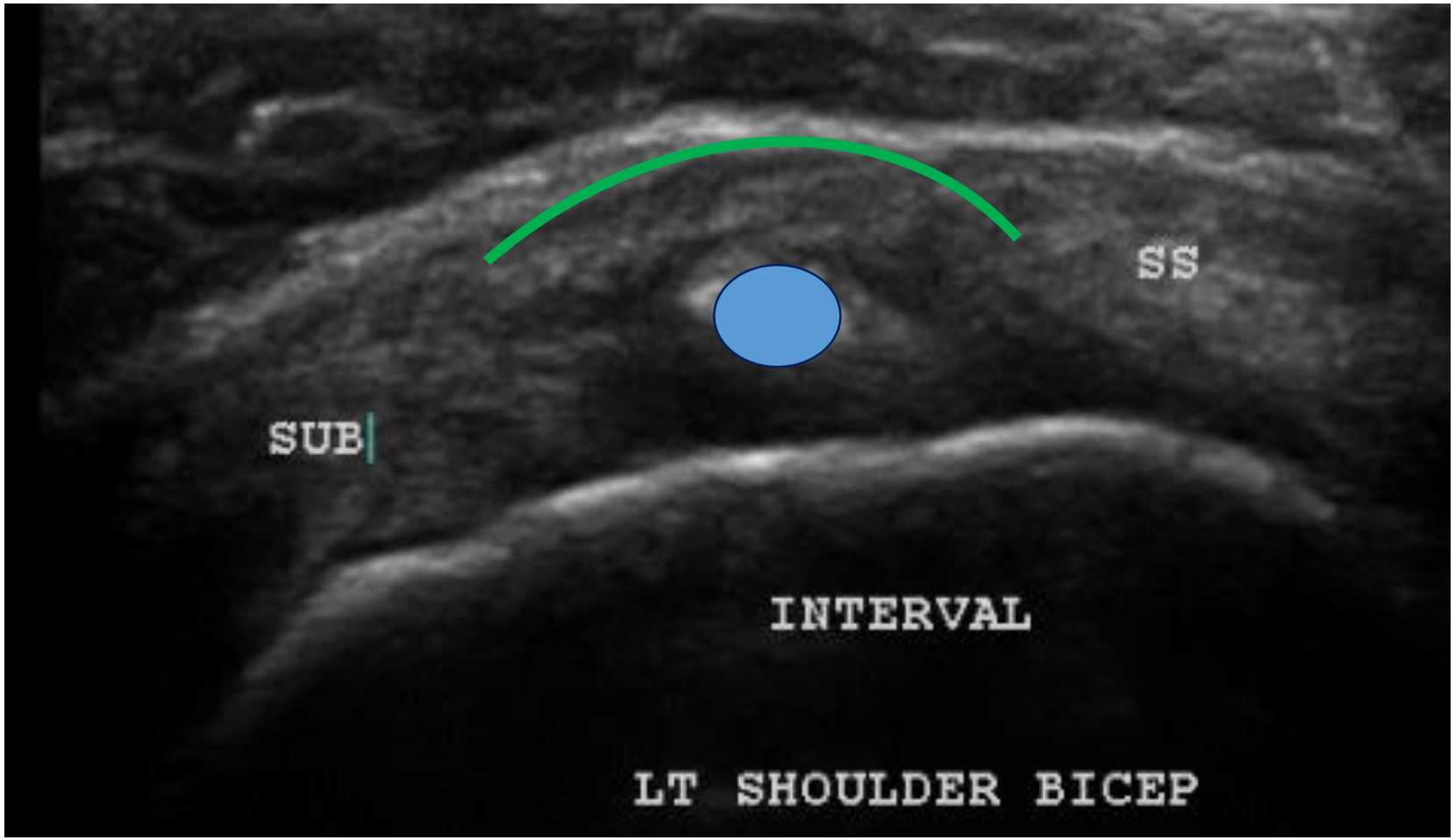
Courtesy Nicki Delves

Rotator interval



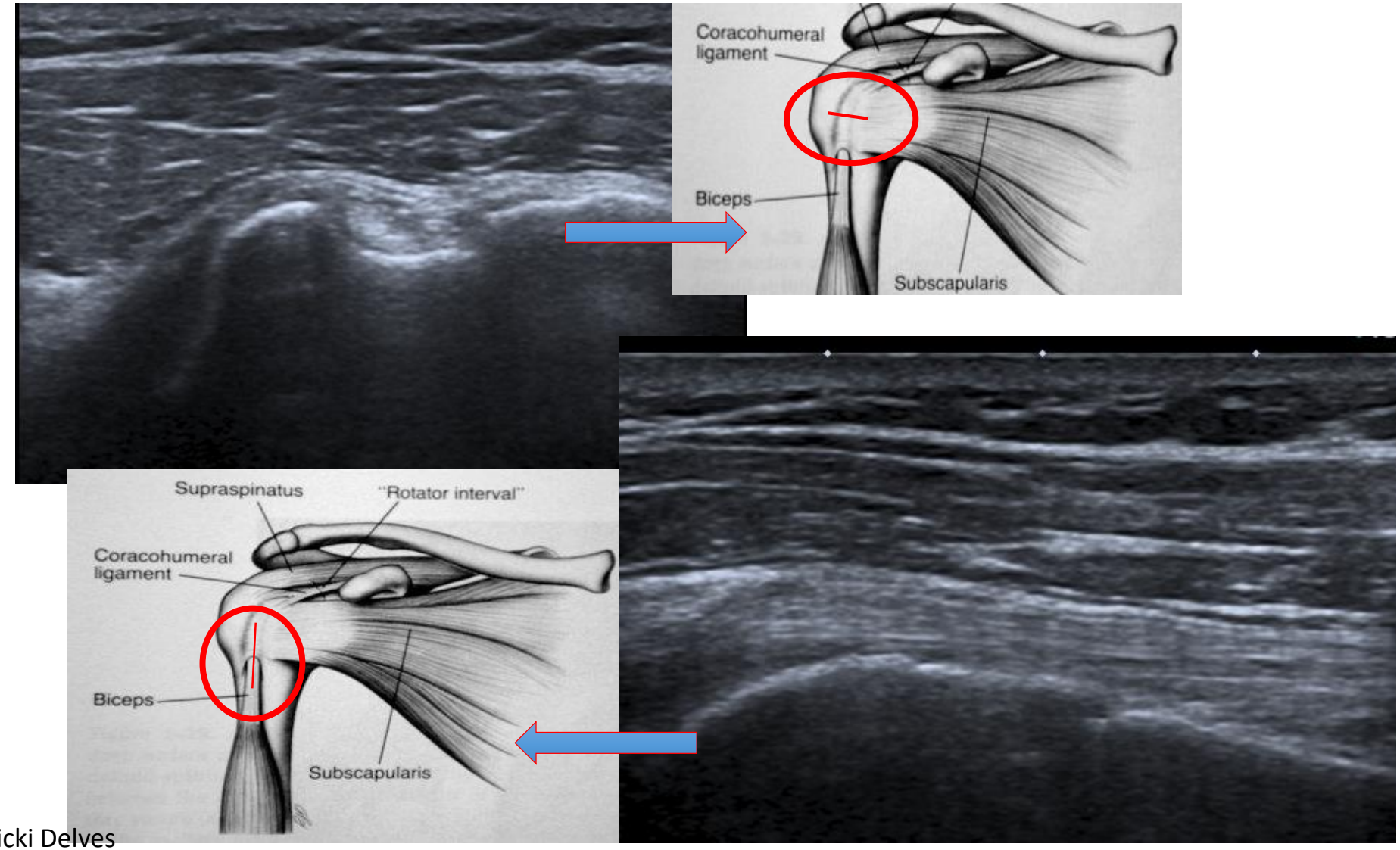
Courtesy Nicki Delves

Rotator interval



Courtesy Nicki Delves

Biceps tendon



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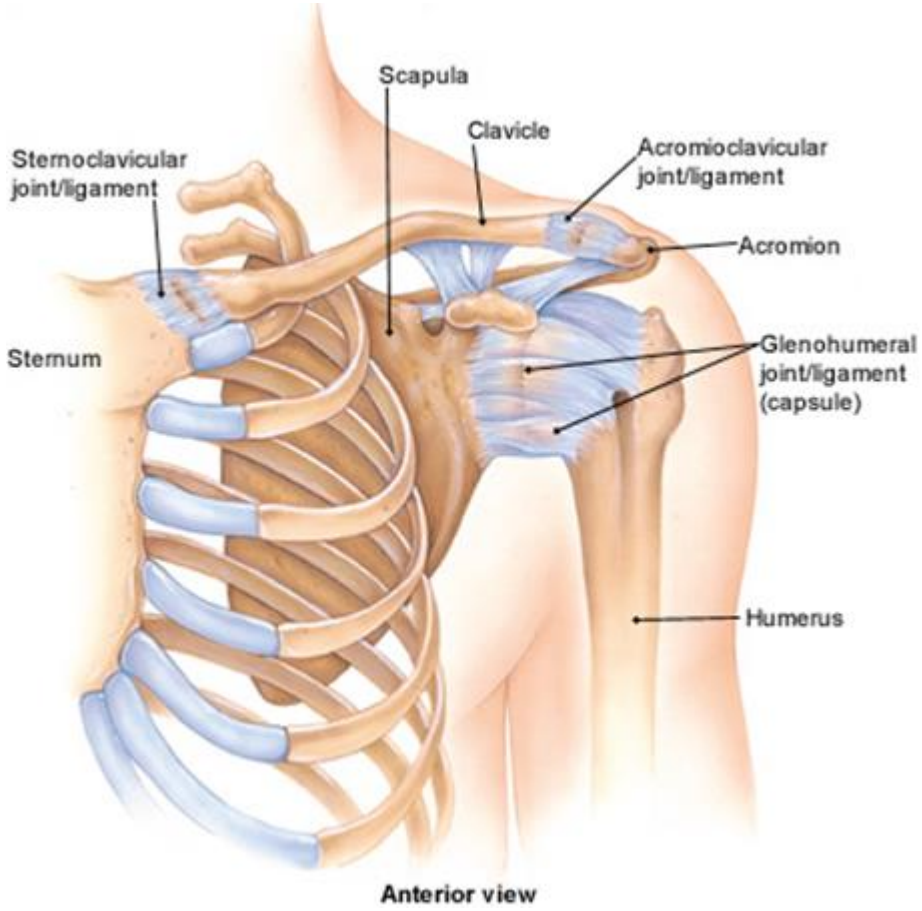
Acromio-clavicular joint



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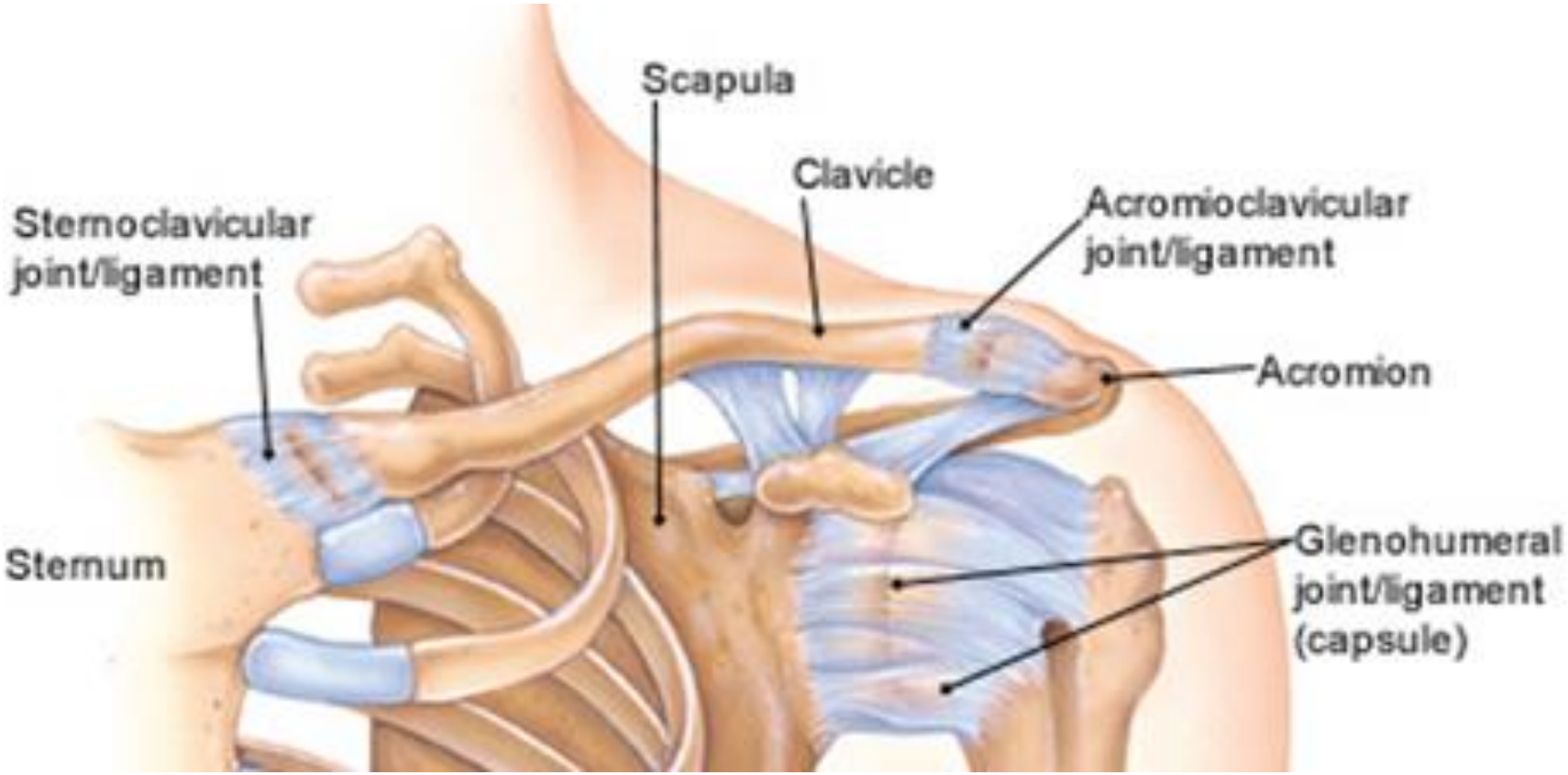
Courtesy Dr Kai Win

Acromio-clavicular joint



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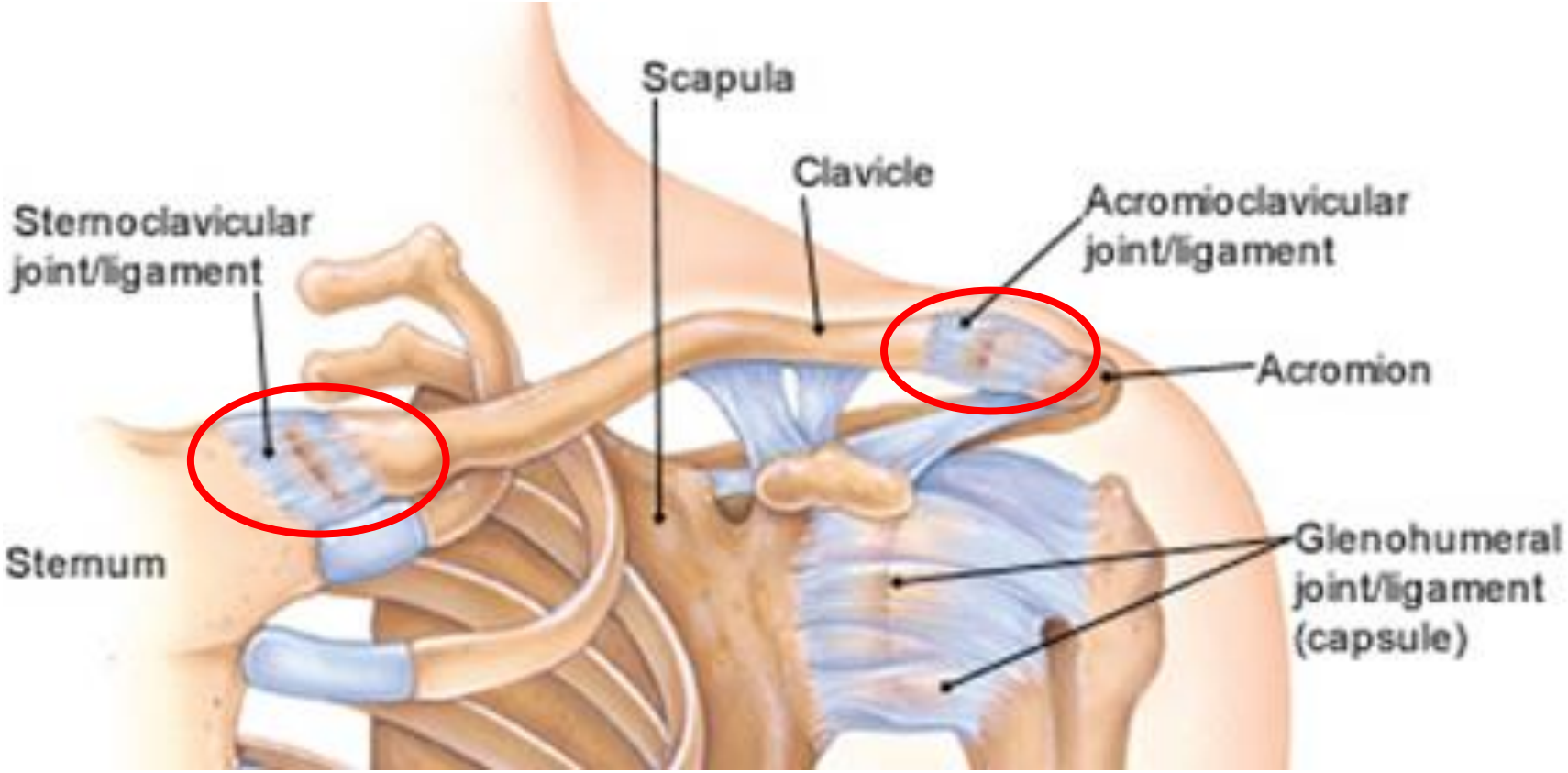
Acromio-clavicular joint



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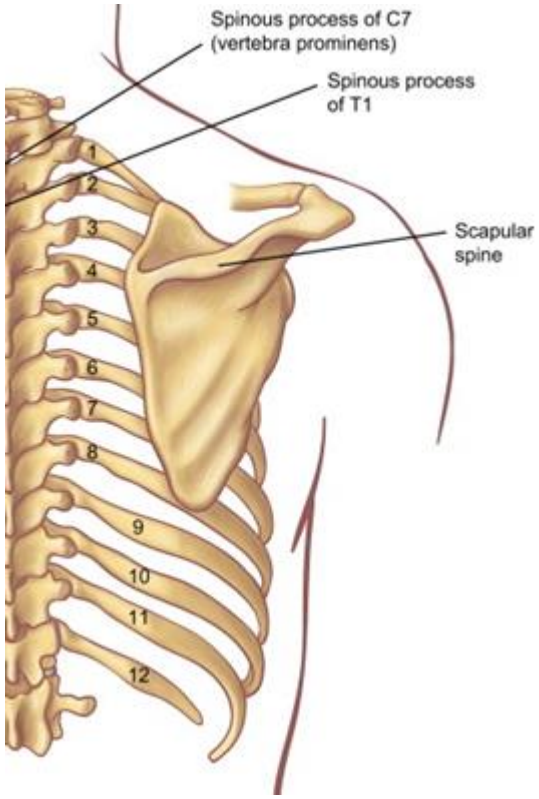
Courtesy Dr Kai Win

Scapula sitting on thoracic wall / rib cage



Fastbleep.com

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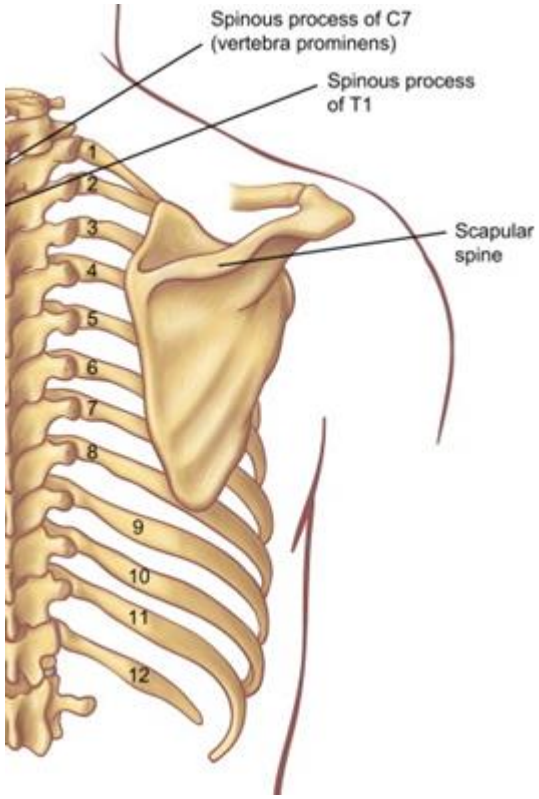

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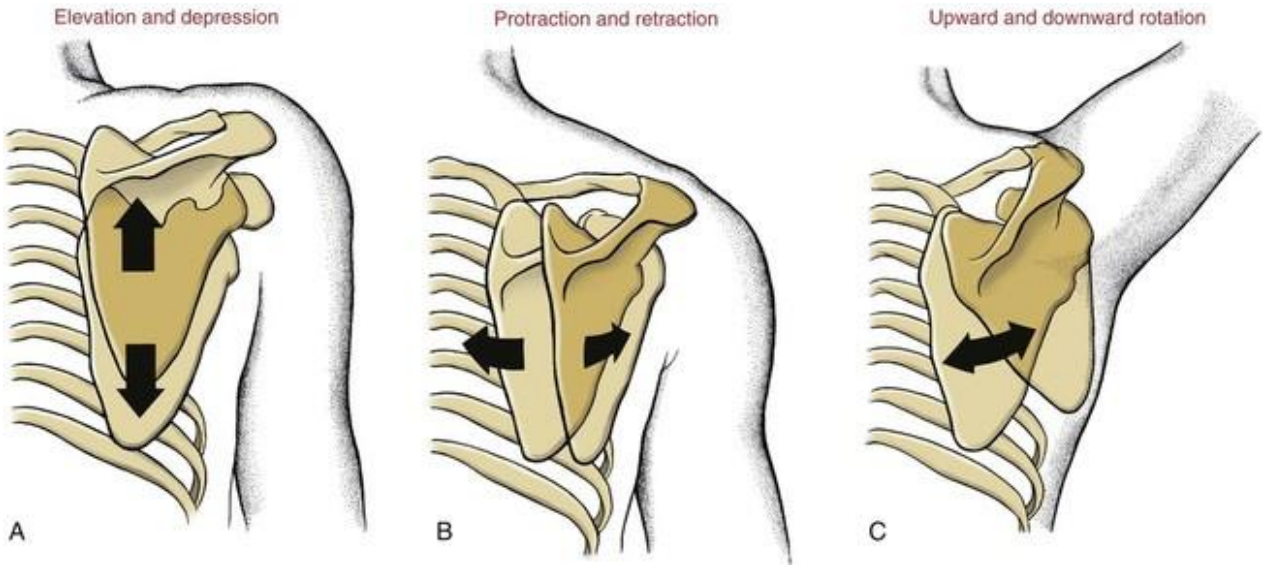

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Physical Therapy in Sport

Volume 10, Issue 2, May 2009, Pages 45–50

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Mike Smith, Valerie Sparkes, Monica Busse, Stephanie E

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Ed INVITED REVIEW

Shoulder & Elbow

Shoulder & Elbow
2016, Vol. 8(1) 61–70
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DOI: 10.1177/1758573215618857
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Scapular dyskinesia: evolution towards a systems-based approach

Elaine G Willmore[1] and Michael J Smith[2]

Taken from http://www.ouh.nhs.uk/shoulderandelbow/information/documents/JRFinal2010poster.pdf

Diagnosis of Shoulder problems in Primary Care:

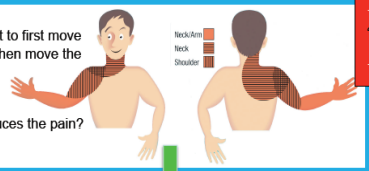
Guidelines on treatment and referral

Red Flags = Urgent Referral

1. Trauma, pain and weakness - ? Acute cuff tear
2. Any mass or swelling - ? Tumour
3. Red skin, fever or systemically unwell - ? Infection
4. Trauma / epileptic fit /electric shock leading to loss of rotation and abnormal shape -? Unreduced dislocation

Is it Neck or Shoulder ?

- Ask the patient to first move the neck and then move the shoulder.
- Which reproduces the pain?



Neck

- Follow local spinal service guidelines

Shoulder

History of Instability?

- Does the shoulder ever partly or completely come out of joint?
- Is your patient worried that their shoulder may dislocate during sport or on certain activities?

	Primary Care		Refer to Shoulder Clinic
Yes	**Instability** Common age 10 - 35 yrs • Physio if Atraumatic	Refer	**Instability** • Traumatic dislocation • Ongoing symptoms • Atraumatic with failed physio

No

- Is the pain localised to the AC joint and associated with tenderness?
- Is there high arc pain.
- Is there a positive cross arm test.

Yes	**Acromioclavicular Joint Disease** Common age >30 yrs • Rest/NSAIDS/analgesics • Steroid injection • Physio • X-ray if no improvement	Refer	**Acromioclavicular Joint Disease** • Refer if transient or no response to injection and physio.

No

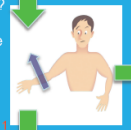
- Is there reduced **passive** external rotation?

Yes	**Glenohumeral Joint** Frozen shoulder Common age 35-65 years Arthritis Common age >60 years • X-ray – to differentiate. • Rest • NSAIDS/analgesics. • Patient information • Cortisone injection	Refer	**Glenohumeral Joint** • If frozen shoulder with normal x-ray – refer if atypical and/or severe functional limitation. • Refer if arthritis on x-ray and poor response to analgesics and injection.

No

- Is there a painful arc of abduction?
- Is there pain on abduction with the thumb down, worse against resistance?

N.B. A history of trauma with loss of abduction in a younger patient = Red Flag 1



Yes	**Rotator Cuff Tendinopathy** Common age 35-75 years • Rest / NSAIDS / analgesics • Subacromial injection • Physiotherapy N.B. Although an ultrasound scan can be of value, 25% of people over 65 years have asymptomatic cuff tears.	Refer	**Rotator Cuff Tendinopathy** • Transient or no response to injection and physiotherapy N.B. Massive cuff tears in patients > 75 years are generally not repairable.

No

Other cause of Neck or Arm pain

The Oxford Shoulder Clinic at the Nuffield Orthopaedic Centre

(see – *www.noc.nhs.uk/shoulderandelbow* - for patient information booklets)

OXFORD Shoulder & Elbow CLINIC

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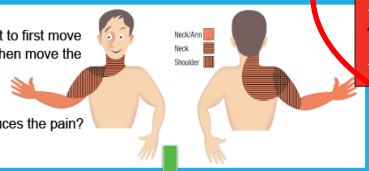

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- Follow local spinal service guidelines

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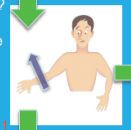

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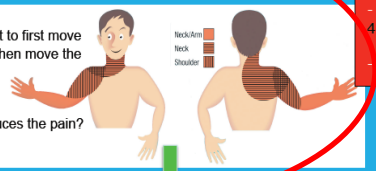

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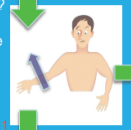

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No

Other cause of Neck or Arm pain

The Oxford Shoulder Clinic at the Nuffield Orthopaedic Centre

(see – *www.noc.nhs.uk/shoulderandelbow* - for patient information booklets)

OXFORD Shoulder & Elbow CLINIC

Taken from http://www.ouh.nhs.uk/shoulderandelbow/information/documents/JRFinal2010poster.pdf

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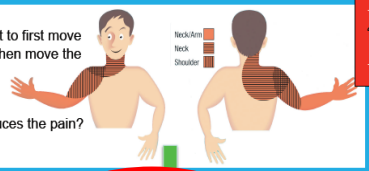

Neck

- Follow local spinal service guidelines

Shoulder

History of Instability?

- Does the shoulder ever partly or completely come out of joint?
- Is your patient worried that their shoulder may dislocate during sport or on certain activities?

Yes → Primary Care: **Instability** (Common age 10 - 35 yrs) – Physio if Atraumatic → **Refer** → Refer to Shoulder Clinic: **Instability** – Traumatic dislocation; Ongoing symptoms; Atraumatic with failed physio

No ↓

- Is the pain localised to the AC joint and associated with tenderness?
- Is there high arc pain.
- Is there a positive cross arm test.

Yes → **Acromioclavicular Joint Disease** (Common age >30 yrs) – Rest/NSAIDS/analgesics; Steroid injection; Physio; X-ray if no improvement → **Refer** → **Acromioclavicular Joint Disease** – Refer if transient or no response to injection and physio.

No ↓

- Is there reduced **passive** external rotation?

Yes → **Glenohumeral Joint**
Frozen shoulder (Common age 35-65 years)
Arthritis (Common age >60 years)
- X-ray – to differentiate.
- Rest
- NSAIDS/analgesics.
- Patient information
- Cortisone injection

→ **Refer** → **Glenohumeral Joint**
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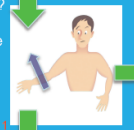

Yes → **Rotator Cuff Tendinopathy** (Common age 35-75 years)
- Rest / NSAIDS / analgesics
- Subacromial injection
- Physiotherapy

N.B. Although an ultrasound scan can be of value, 25% of people over 65 years have asymptomatic cuff tears.

→ **Refer** → **Rotator Cuff Tendinopathy**
- Transient or no response to injection and physiotherapy

N.B. Massive cuff tears in patients > 75 years are generally not repairable.

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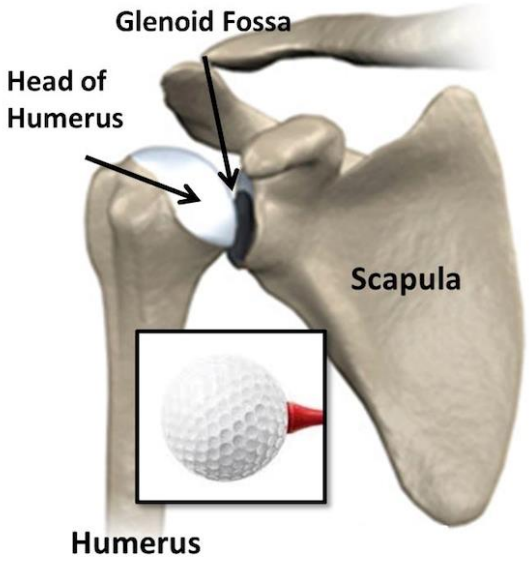
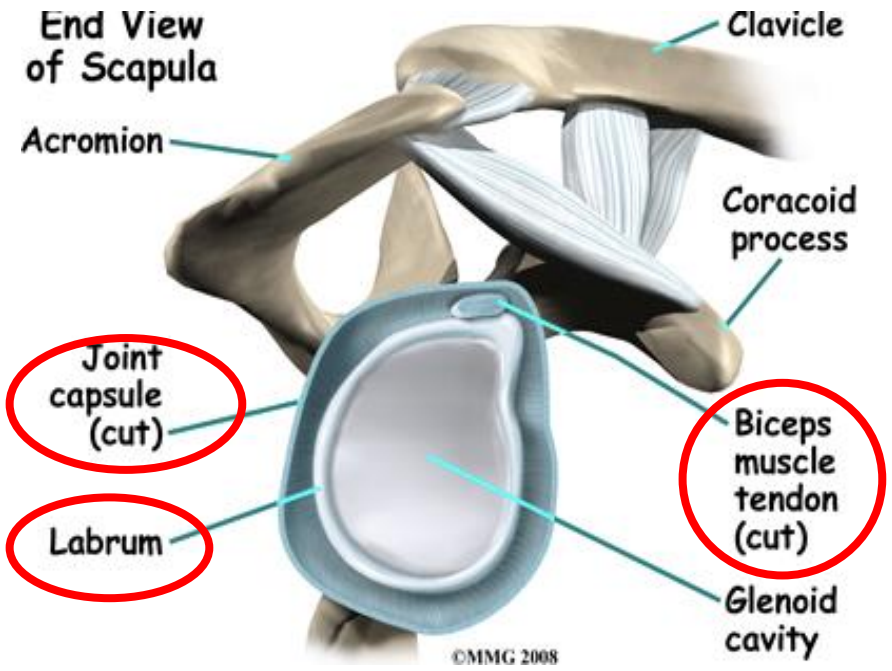
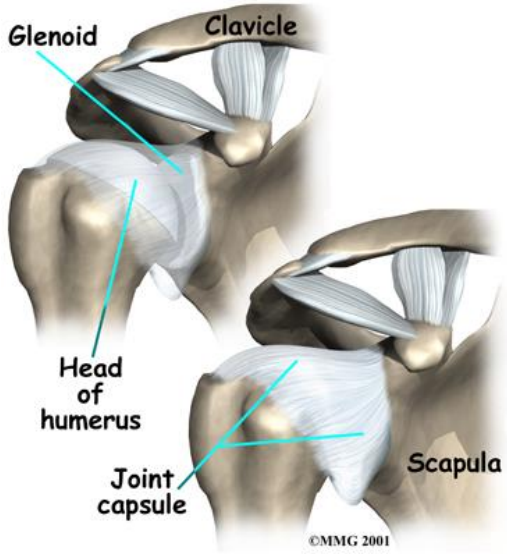
OXFORD Shoulder & Elbow CLINIC

Instability







Courtesy Nicki Delves

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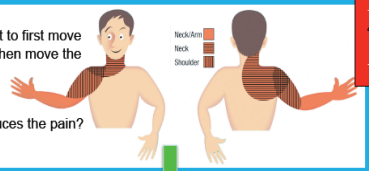

Neck

- Follow local spinal service guidelines

Shoulder

History of Instability?

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	Primary Care		Refer to Shoulder Clinic
Yes	**Instability** Common age 10 - 35 yrs • Physio if Atraumatic	Refer	**Instability** • Traumatic dislocation • Ongoing symptoms • Atraumatic with failed physio

No

- Is the pain localised to the AC joint and associated with tenderness?
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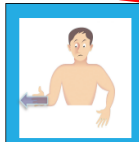
Yes	**Acromioclavicular Joint Disease** Common age >30 yrs • Rest/NSAIDS/analgesics • Steroid injection • Physio • X-ray if no improvement	Refer	**Acromioclavicular Joint Disease** • Refer if transient or no response to injection and physio.

No



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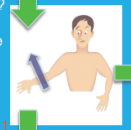

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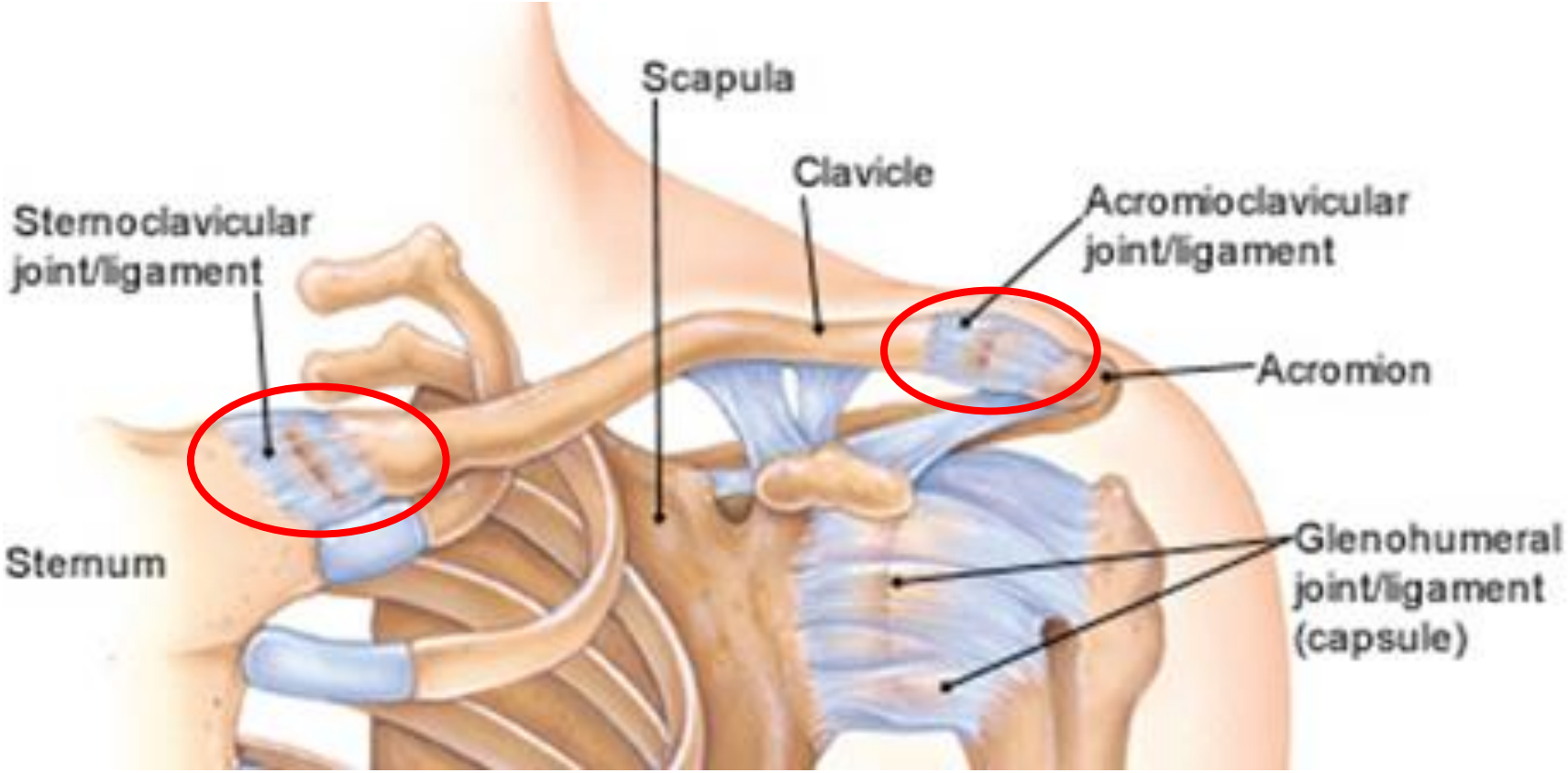
OXFORD Shoulder & Elbow CLINIC

Acromio-clavicular joint



© Lydia Kibuk (2000)
Courtesy Dr Kai Win

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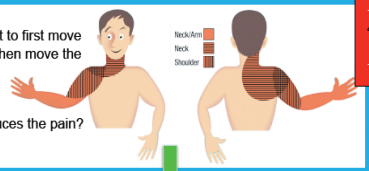

Neck

- Follow local spinal service guidelines

Shoulder

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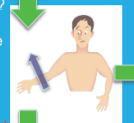

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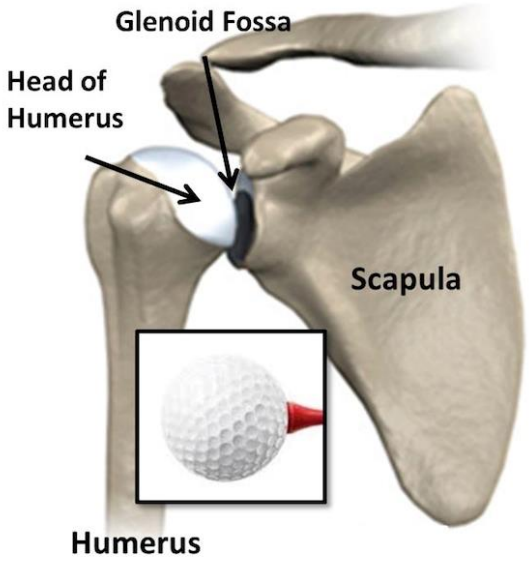
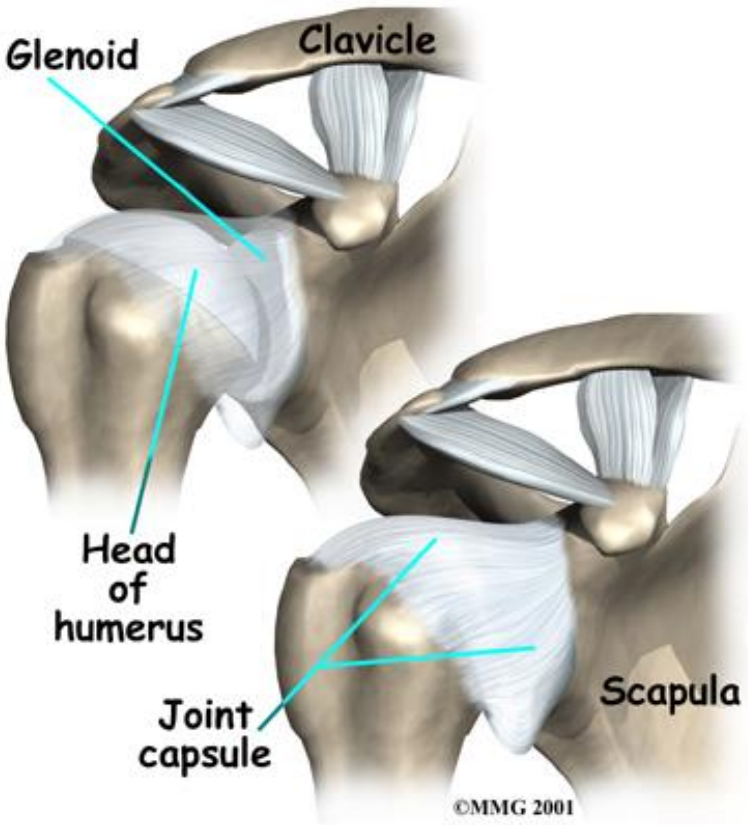
OXFORD Shoulder & Elbow CLINIC

Frozen shoulder; GHJ OA





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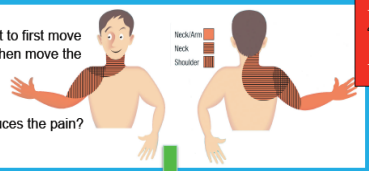

Neck

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N.B. A history of trauma with loss of abduction in a younger patient = Red Flag 1

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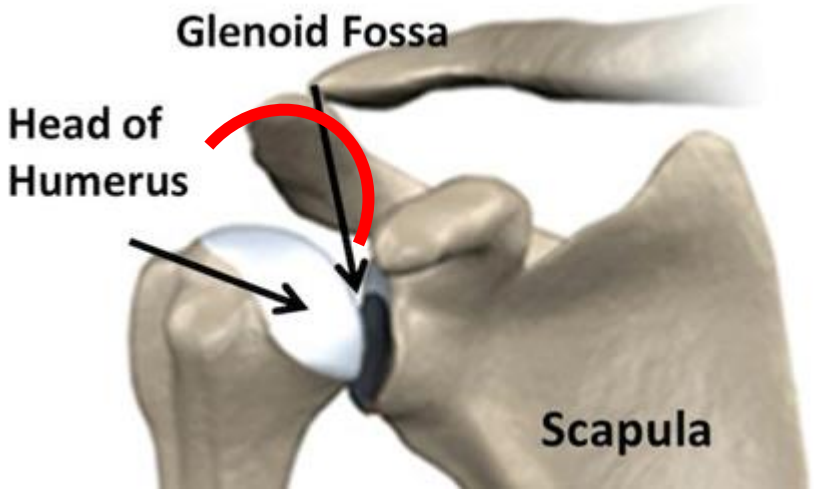
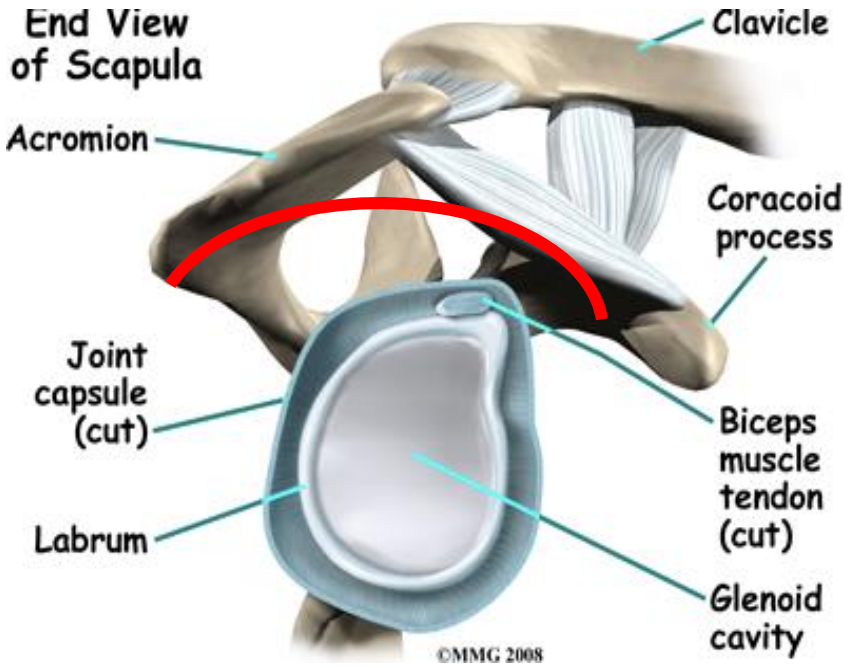
OXFORD Shoulder & Elbow CLINIC

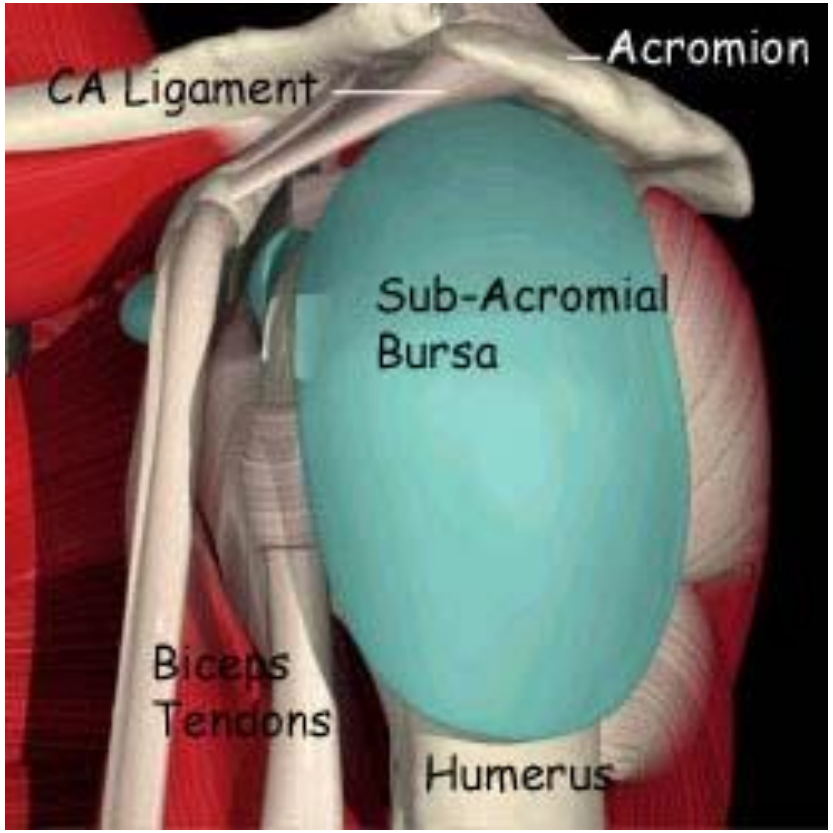
“Impingement”





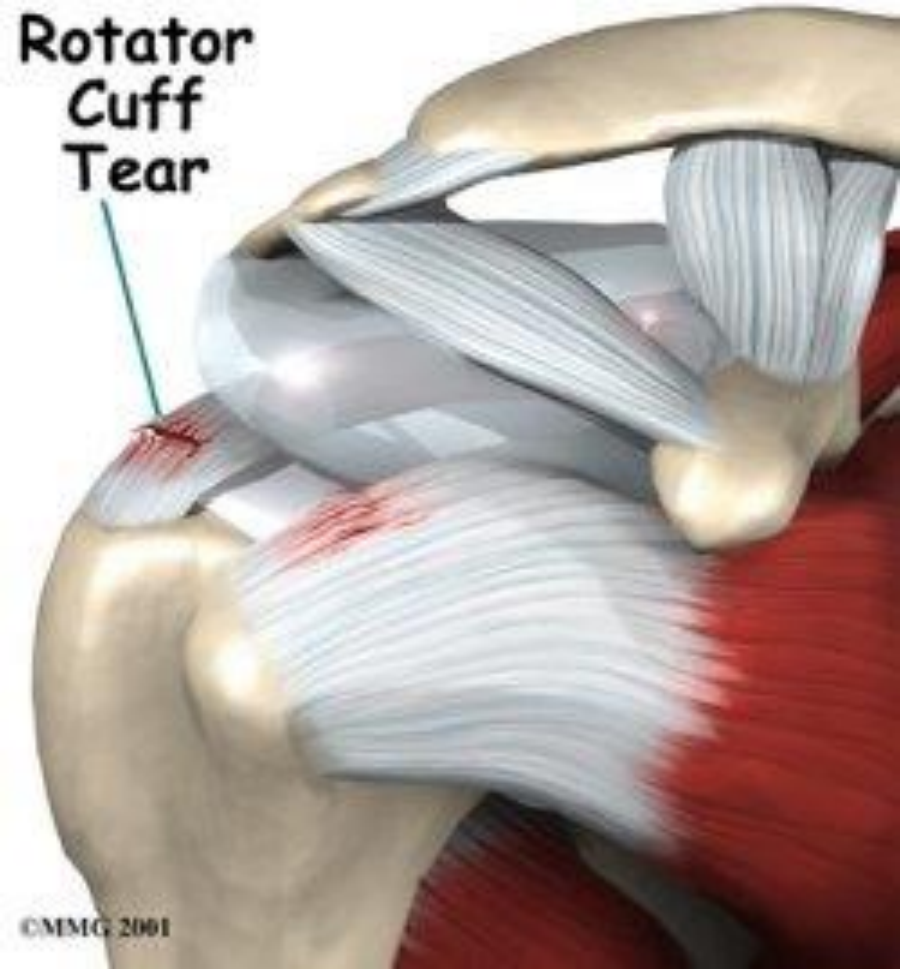
Courtesy Nicki Delves

Bursal involvement



Courtesy Kate Norris & Nikki Meredith

Rotator cuff tears



Some orthopaedic tests
www.shoulderdoc.co.uk – so far 129 found

- Empty can test
  - Pain, muscle weakness
- Hawkins Kennedy

- Neer impingement test
  - Scapular held down, examiner passively abducts the arm
- ACJ

  Scarf test

- Others:
  - Anterior apprehension
  - Scapular assistance test
- Various rotator cuff tests

“Ask the questions you felt too self-conscious to ask”

- The management of certain conditions, post scan, e.g.

1. Calcified tendinopathy, in its varying forms; perhaps comparison of clinical management over barbotage.

2. Adhesive Cap - in its varying stages and when more urgent Physiotherapy fits in.

This can empower the sonographer to gauge the clinical significance of the scan findings and to be able to discuss this in an informed way with the patient.

- Q. What is the difference between tendinosis and tendinopathy? When do you use the terms in reporting? Symptomatic non symptomatic

- Q. What thickness should Supraspinatus be, age affecting etc

- Q. Should we always comment on impingement?

“Ask the questions you felt too self-conscious to ask”

- does a specific orthopaedic test mean the patient has a particular pathology?
- should I try and reproduce their symptoms when I scan them?
- if they have neck pain then is there any point in scanning them?
- what is actually causing pain at the shoulder?
- is a frozen shoulder the only reason for a stiff shoulder?
- what are the 3 things I should ask before I scan them?
- what are the 3 things I should do to them / ask them to do before I scan them?
- what should I tell them if I find a tear, calcific deposit, etc?

Special Tests – all taken from previous MSK SiG presentation by Eoghan Murray

- ‘‘it is not possible to make a definitive diagnosis with the clinical tests currently in use’’ (Lewis, J & Tennent, D., 2007)
- ‘’Currently, almost without exception, there is a lack of clarity with regard to whether common tests used in clinical examination are useful in differentially diagnosing pathologies of the shoulder’’ (Hegeduset al. 2008)

- No test is absolutely diagnostic of a particular shoulder pathology
- No test series capable of selectively assessing r/c + S.A bursal tissues + integrity of the S.A space
- All clinical tests stretch and/or compress S.A bursae
- Reduce specificity and ability to differentiate

- Difficult to isolate individual tendons and other structures and inform accurate diagnosis:
- –r/c morphology -r/c cable
- –Position + innervation of sub-acromial bursae
- –Lack of correlation between symptoms and imaging, U/S + MRI
- Tests reasonably reliable when used in combination **and in context to clinical**

Special Tests (cont)

- Validity of the Tests
- Neer72% sensitivity, 60% specificity
- Hawkins Kennedy 79% sensitivity, 59% Specificity
- Painful arc 53% sensitivity, 76% specificity

(Hegaduset al., 2012)

- Impingement Tests:
- –Relatively high sensitivity but low specificity
- –Substantially decreases utility in deriving a specific diagnosis.
- •Not all structural failure correlates with symptoms

- Tests reasonably reliable when used in combination and in context to clinical picture.

•Testing must be used in conjunction with the subjective history

•Combination of tests provides more conclusive diagnosis

Special Tests (cont): radiological correlation?

- Poor correlation between structural failure and symptoms
- R/C pathology related to age