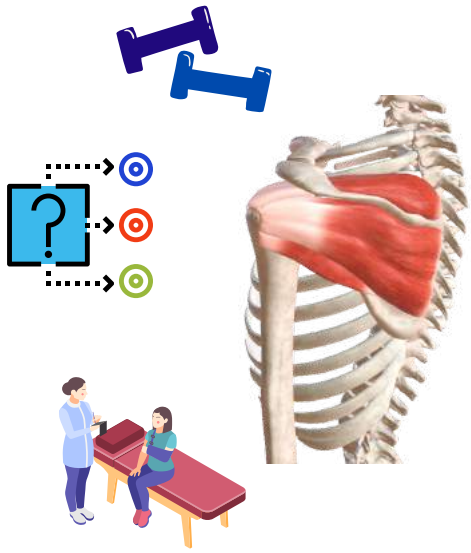
ClinicalPhysio

The Rotator Cuff

Anatomy, Diagnose, Rehab

Handbook



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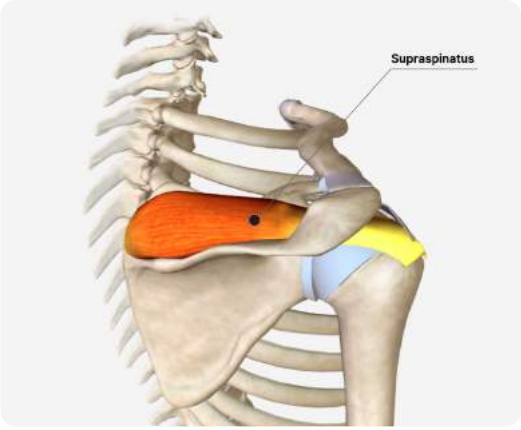
Anatomy

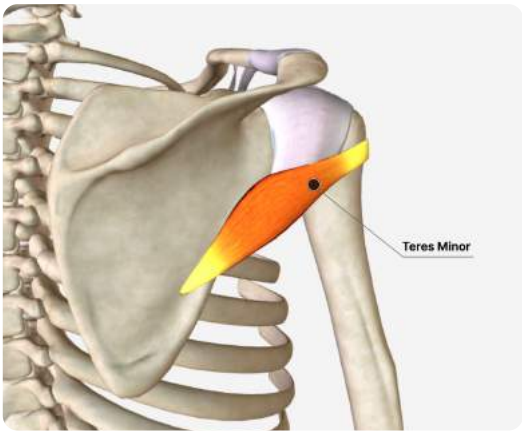


Supraspinatus

Origin: Supraspinous Fossa of Scapula
Insertion: Superior Facet of Greater Tuberosity of Humerus
Action: Lateral Rotation of Humerus
Nerve: Suprascapular Nerve

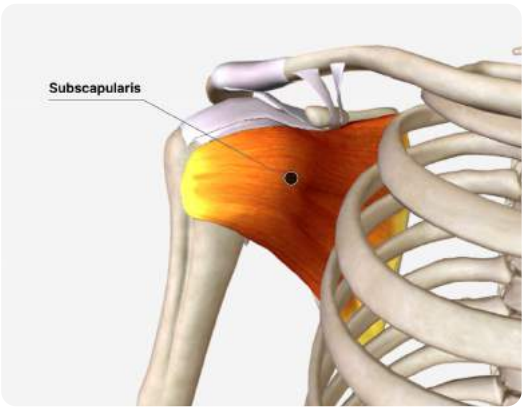
Infraspinatus

Origin: Infraspinous Fossa of Scapula
Insertion: Middle Facet of Greater Tuberosity of Humerus
Action: Lateral Rotation of Humerus
Nerve: Suprascapular Nerve



Teres Minor

Origin: Supero-Lateral Border of Scapula
Insertion: Inferior Facet of Greater Tuberosity of Humerus
Action: Lateral Rotation of Humerus
Nerve: Axillary Nerve



Subscapularis

Origin: Subscapular Fossa
Insertion: Lesser Tuberosity of Humerus
Action: Medial Rotation of Humerus
Nerve: Upper and Lower Subscapular Nerves

Note: All 4 work together as a dynamic stabiliser of the humerus during movement

Pathology: Tendinopathy

- AKA Rotator Cuff Related Shoulder Pain due to variety of terminology used and potential pathologies at play
- Pain thought to arise from Rotator Cuff Tendon pathology causing **lateral upper arm pain**
- Can also have contribution of bursitis
- **"Impingement" theory is heavily disputed!**

Subjective Signs

- History of **increased activity level** / **repetitive activity** / **manual jobs**
- Pain located to **upper lateral arm**
- **Not able to lie on shoulder**
- Aggravated by: **Lifting movements** (particularly flexion/abduction above 90°), **Loaded activity**
- **Can be present at rest in irritable cases**
- **No sensory** symptom changes
- **No referred** symptoms

Objective Signs

- **No wasting, swelling, redness, bruising**
- **Reasonable AROM** most of time, may have **painful arc**
- **Full PROM** which is more comfortable (most of time)
- **Resisted Tests**: Strong and Painful vs Weak and Painful
- **Special tests** may or may not be helpful

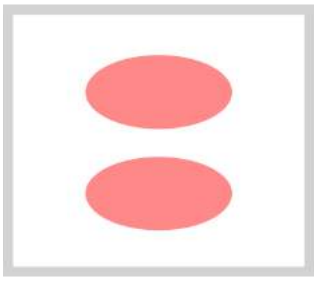
Think about really irritable tendinopathy though?

Consider that someone has just walked in 2 days after the start of a really irritable tendinopathy may well present with a more clear range of movement deficit and with weakness. So in this situation, reasoning is required to clarify if the patient is more likely to have a RC Tear or are simply in the stage of a reactive, irritable tendinopathy

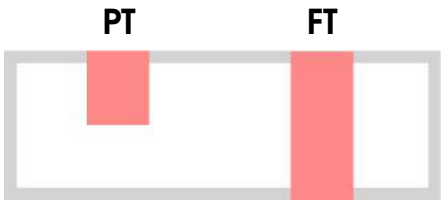
Pathology: Cuff Tear

- Tear in **1 or more** of the rotator cuff tendons
- Usually at **point of insertion into Tuberosities**, but can be at point of Musculotendinous junction
- Can be **partial** thickness or **full** thickness

Birds Eye View



Lateral View



- **Other descriptors include**:
  - Articular Sided vs Bursal Sided
  - Retracted
  - Fatty Infiltration
- Sometimes **pattern of tear** is described as U-shaped, L-shaped, Crescent shaped or small/medium/large

History

- May or may not have a **history of trauma**
- **Trauma more likely in younger patient** E.g. with shoulder dislocation
- **Lower energy trauma in the older patient** E.g. Fall into wardrobe
- **Typically** seen in **over 40 year olds**
- **Consider** General Health, PMH, previous tendon ruptures, overweight, diabetic, smoker, steroid use

Pathology: Cuff Tear

Subjective Signs

- **Pain on moving the arm**, typically into abduction and flexion
- **May not be able to load** with weight
- **Difficult to lie on**
- Can also be **painful at rest**

Objective Signs

- Potential for **wasting** in big tears
- **Limited active range of movement** and **painful**
- **Passive range of movement full** and more comfortable
- **Weak** on rotator cuff strength testing +/- pain
- **Special tests:**
  - Drop arm test
  - Lag test
  - Lift off test
  - Belly press test
  - Hornblowers sign
  - Yocum's test

Pathology: Massive Cuff Tear

- **Tear over 5cm size** or involving **2 or more tendons**
- Seen more in the **elderly patient**
- **Very little surgical options** available at present for **younger patients**
- Can develop **Cuff Arthropathy**:
  - Osteoarthritic changes due to abnormal humeral head position
  - "Acetabularisation over the acromion with femoralisation of the humeral head"

Subjective Signs

- More likely to have **history of trauma** or **mechanism of injury**
- **Significant Trauma** more likely in **younger patient**
- **Lower energy trauma** in the **older patient** E.g. Fall into wardrobe
- **Pain on moving the arm**, typically into abduction and flexion
- Reports **not being able to move arm**
- **Difficult to lie on**
- Can also be **painful at rest**
- **Consider** general health, PMH, previous tendon ruptures, overweight, diabetic, smoker, steroid use

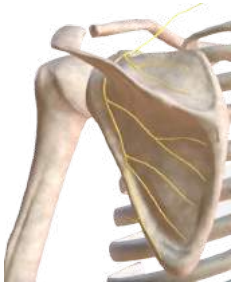
Objective Signs

- Likely to see **wasting** over scapula
- May have **crepitus** during movement
- **Abnormal movement strategies** e.g. hitching
- **Extremely limited active range of movement** +/- painful
- **Passive range of movement often preserved**, but may be **stiff if patient has rotator cuff arthropathy**
- **Very weak on cuff testing** +/- pain

Special tests:

- **Drop arm test**
- **Lag test**
- Lift off test
- **Belly press test**
- Hornblowers sign
- Yocum's test

Pathology: Nerve Injury



- Compression or changes to conduction to the peripheral nerves supplying the rotator cuff:
  - Supraspinatus: **Suprascapular Nerve**
  - Infraspinatus: **Suprascapular Nerve**
  - Teres Minor: **Axillary Nerve**
  - Subscapularis: **Upper and Lower Subscapular Nerves**
- Can have **short or long term implications**
- **How**: Cysts? Post-surgical? QSS?

Subjective Signs

- **Gradual or Sudden onset,** potentially following trauma or post surgery
- Be mindful of: **Previous Shoulder injury, Fracture or Surgery in History**
- Often **posterior shoulder pain**
- **Complains generally of weakness**
- **No sensory loss in most cases**
- Struggles to generate **power over head**
- **Fatigues quickly**
- **Typically younger patients**

Objective Signs

- Likely to see **wasting over scapula**
- **Potentially reduced active range of movement**
- Should have **good passive range of movement**
- **Pain free weakness** on testing
- Scratch Collapse Test? Tinels Test?
- **Look at strength in positions where cuff is isolated**
  - Belly Press for Subscapularis
  - Supine Resisted Tests at 90 abduction

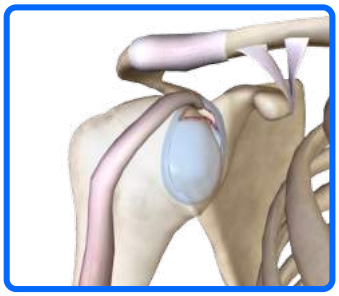
Differentiation

Frozen Shoulder

- Clear age correlation between 40-60
- More likely to present with active and passive restriction in ROM with clearest restriction in External Rotation
- Pain and stiffness the most clear symptoms rather than weakness

Shoulder OA

- Most likely to present in older ages
- More likely to present with active and passive restriction in ROM
- Listen for signs of crepitus and stiffness (which needs XR)
- Remember, patient could present with OA and Cuff Pathology in relation to a Rotator Cuff Arthropathy



SLAP Tear

- Most likely to happen through Trauma or Repetitive Stress
- Deep seated ache vs lateral upper arm pain
- More likely in younger patent (less than 40 years old)
- Positive tests may include Cluster testing with Biceps Load Test 1 and 2, with O Brien's Test

Cervical Spine

- Consider neck pain associated with arm pain as a start with
- Scapula pain, particularly medal and superior often associated with cervical spine pathology
- Look for bilateral symptoms or nerve related symptoms which are more likely to be cervical spine related
- Remember we have a full webinar called "Neck or Shoulder" that goes through full differentiation points!

Rehab: Tendinopathy

- "**Offload to Reload**"
  - 1-2 weeks of decreased load, then slowly build back up
- **Graded Loading Programme**: 3 times a week -

"Pain reduction is a priority in managing irritable RC tendinopathy"

(Lewis et al, 2015)

- Aim for Pain Free
- **Education and Expectation Management**
- **Analgesia** (via GP if needed)
- **If not improving:**
  - Consider Symptom Modification Process
  - Steroid Injection
  - Refer for investigations to rule out tear (as a last resort)

A Brief Look at Symptom Modification

- **Initiated by Jeremy Lewis**
- Remains Controversial but provides good foundation for looking at what may improve or worsen patient's pain
- **Includes many different facets such as:**
  - Scapula Elevation, Depression, Retraction
  - Thoracic Extension
  - Humeral Head Mobilisations
  - Trial of Eccentric Movements
- Some of the key ones Marie looks at...
  - Making a fist to initiate RC activation
  - Increased posterior cuff activation
  - Scapula Facilitation

Rehab: Tendinopathy

Example Patient

- **44 year old Male: Right hand dominant**
- 2 weeks ago, spent the weekend trimming hedge, and has tried to continue playing tennis and going to gym since then
- Now has **Right shoulder pain** at the **Upper Lateral Arm**
- **Reduced AROM:** Flexion 140°, Abduction 140°, Ext Rot Full
- **Painful Arc** with movement
- **Resisted RC Tests:** Painful but not specifically weak

Example Rehab Plan

First Steps

- **Offload to Reload:** Stop tennis 2/52, Legs and Cardio only in gym
- **Long Hold Isometrics:** 10-20 seconds Abduction and External Rotation, 3 reps, 3 times a week

4 weeks later:

Presume Full Range of Movement, Pain Reduced, Still Painful Arc

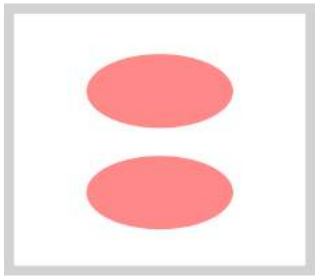
- **Progress exercises to strengthening** to meet lifestyle demands (gym and gardening)
- Lateral Raises and Front Raises with a weight (not high weight)
- **Aim for Endurance**: 14-18 Reps with a low weight
- Increase load a little when can reach 20 Reps
- OR **try Symptom Modification**: What has the biggest impact on symptoms (Make Fist, Scapula OP or Posterior Cuff Activation)?

Rehab: Cuff Tear

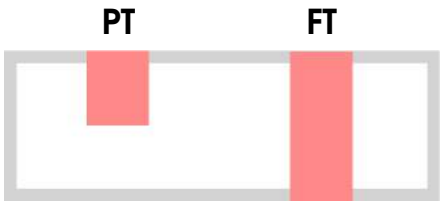
Types of Tear

Partial vs Full

Birds Eye View



Lateral View



Partial vs Full

Can present similar with less severe restrictions (like tendinopathy)

In which case, you may **treat like tendinopathy initially** but **refer on if not making progress**

If suspected e.g. (profound wasting and loss of range)...

Talk to Senior Physio or ESP in terms of management and referring on

Traumatic vs Atraumatic

If Clear Trauma
+/- No Progress with Physio: refer to local guidelines with regards to investigations and onward referral

Trial rehab for a period of 3-6 months

However, **if pain limiting or really poor progress**, can consider referring on sooner.

Rehab: Cuff Tear

Rehab Principles

- **Education:** Cuff Anatomy, Avoiding aggravating activities
- **If Movement Limited: ROM Exercises**
  - Stick assisted, Wall slides, Table slides, Table stretch
- **Consider Symptom Modification** to help with buy in and then plan **strengthening exercises** based on that
- **Avoid weighted abduction if painful:** often find that this just irritates things

Who Gets Surgery?

- **Young traumatic tears with significant functional deficits**
- **Otherwise**:
  - People who are **not coping**
  - **Have explored other conservative measures** with limited benefit (I.E. Rehab, Analgesia, Steroid Injection)
  - **Sub-Acromial Decompression for non-copers?**

Rehab: Massive Cuff Tear

- **Management Options: Surgical vs Rehab**
- **Check your local guidelines:** Managed differently in different areas
- **Considerations**:
  - How **old** is the patient?
  - How **big** is the tear?
  - How much **functional deficit** do they have?
  - Are they **coping**?
  - **Surgical Considerations**: PMH, Quality of Bone/Tendon

Rehab Principles if seeing patient conservatively

- **Main Focus: Training Anterior Deltoid and the Rotator Cuff**
- If possible: Resisted External and Internal Rotation
- Combined Movements e.g. Wall Press Ups
- **Anterior Deltoid Rehab:**
  - No clear consensus from the research on reps/sets
  - Most will be given **Daily up to 1 Minute, 2-3 times a day**

Rehab: Nerve Injury

If Suspected, Refer to Orthopaedics

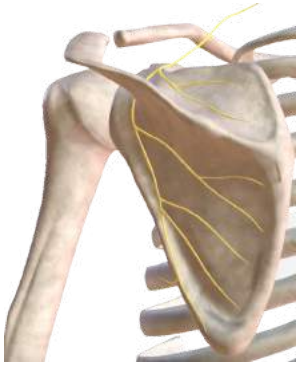
- **Nerve Conduction Studies**
- **MRI** to see if cause of nerve injury is reversible
  - E.G. Compression from Cyst
- Can continue rehab in meantime
- Rehab will also be guided by recovery and so **need prognostic evaluation** in place for this

Rehab Principles

- **Range of Movement Exercises to maintain range**

- **Strengthening** as tolerated with **more global exercises** where other muscles can be maintained
  - Wall Push Up's, Pulling Theraband, Rows

- **For Main Muscles Affected by Nerve Injury:**
  - Specific strengthening based on what they can tolerate
  - E.G. Gravity Eliminated Exercise if G2 on Oxford Scale



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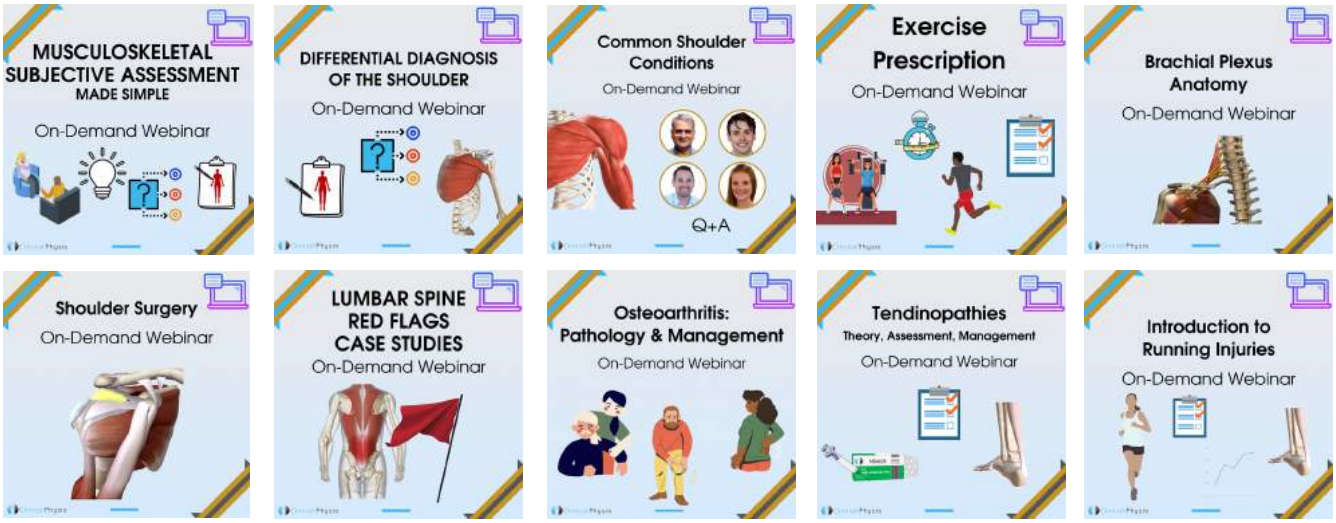

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