



433 Teams  
**ORTHOPEDICS**

Lecture 17

Common shoulder  
disorders

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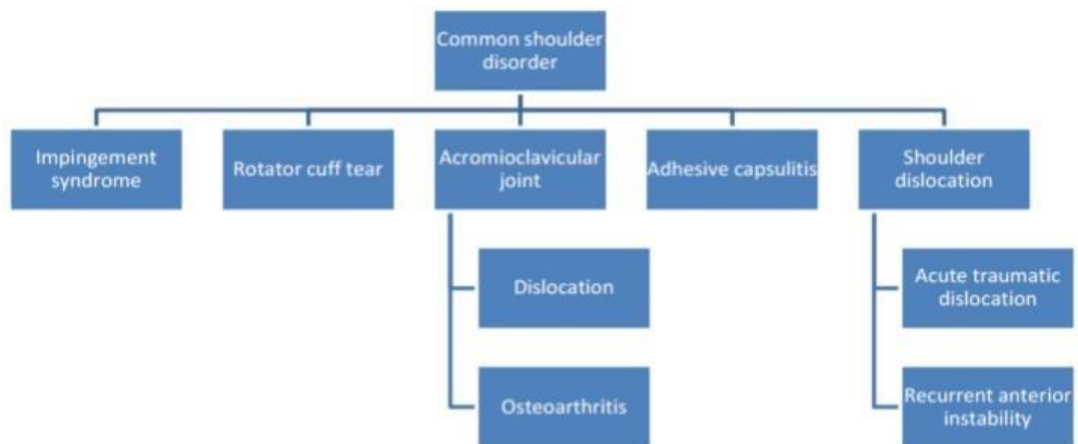
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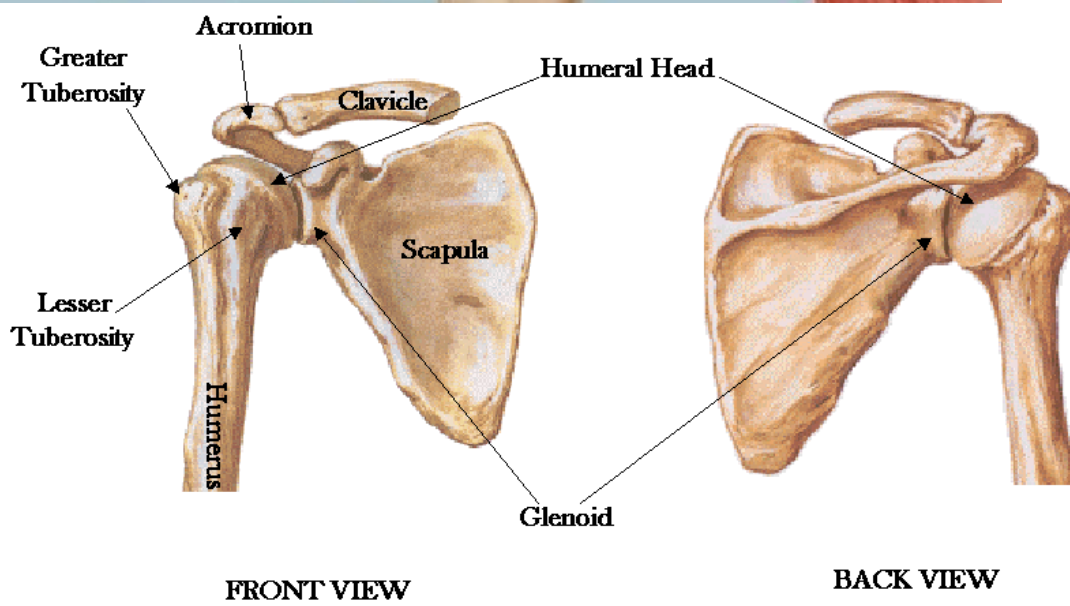
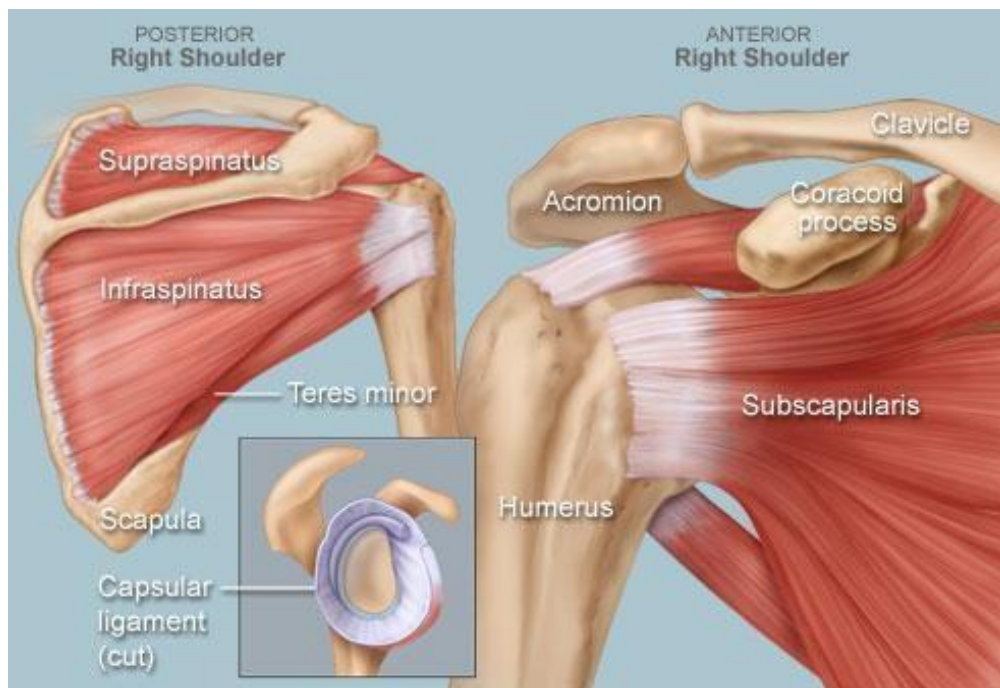
## Objectives

- Specify the symptoms, signs and potential immediate complications of common shoulder disorders
- Outline the assessment and appropriate investigation and to outline the immediate and long term management of patients common shoulder disorders
- Demonstrate knowledge of indications for non-operative and operative treatment and to know the most common non-operative and operative measurements used for common shoulder disorders.

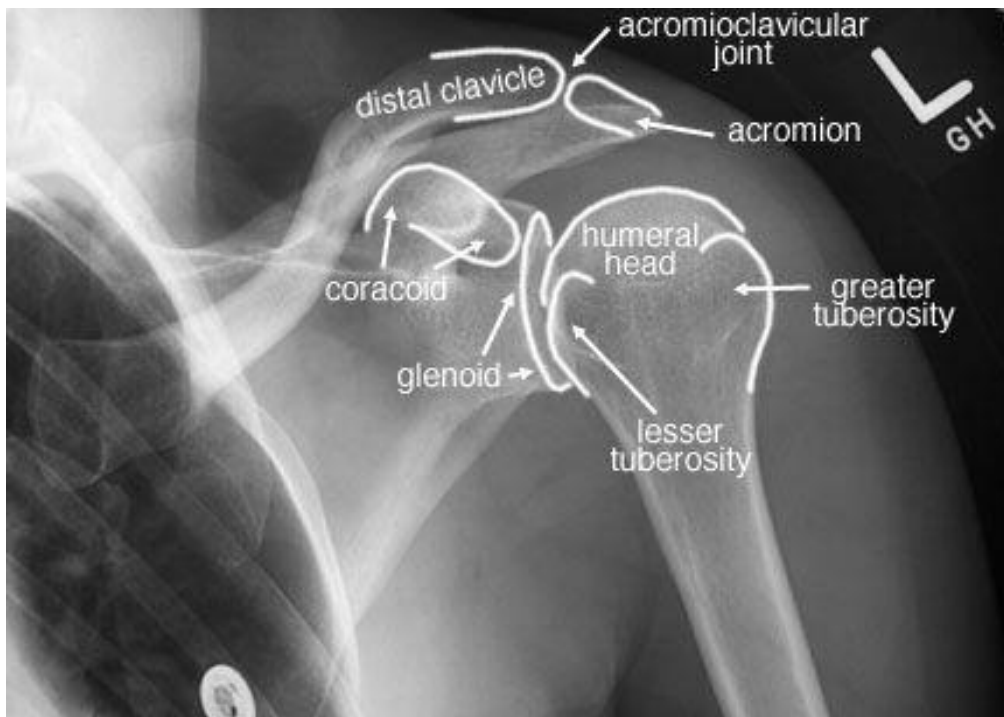
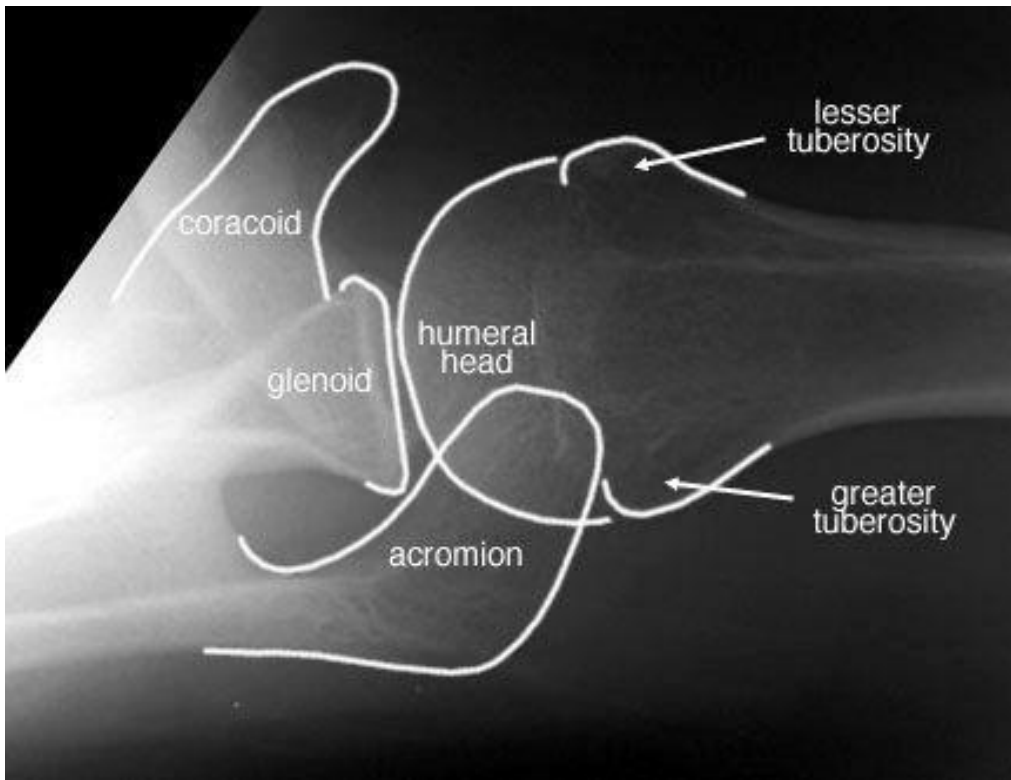
## MIND MAP



# Anatomy of the shoulder



# Radiology of the shoulder



# Shoulder Disorders:

## 1- Subacromial Impingement Syndrome(SIS):

Is the **most common disorder of shoulder**, accounting for 44–65% of all complaints of shoulder pain during a physician's office visit.

### Represents a spectrum of pathology:

1. Subacromial bursitis
2. Rotator cuff tendinopathy
3. Partial- and full-thickness rotator cuff tears.

Stages of the impingement process		
Stage 1	Stage 2	Stage 3
< 25 Y/O	25-40 Y/O	>40 Y/O
Acute bursitis with subacromial edema and hemorrhage.	The bursa no longer lubricates the underlying rotator cuff, leading to <u>rotator cuff tendinopathy</u> .	Progression to <u>partial-thickness tear</u> or a <u>full thickness tear</u>

**Extrinsic Causes of SIS** (decrease the distance between the humeral head and acromion)

### # Acromial morphology: (below pics)

Type I → flat

Type II → curved

Type III → hooked (higher incidence of cuff tears)

### # Coracoacromial ligament (CAL):

Acromial spurs

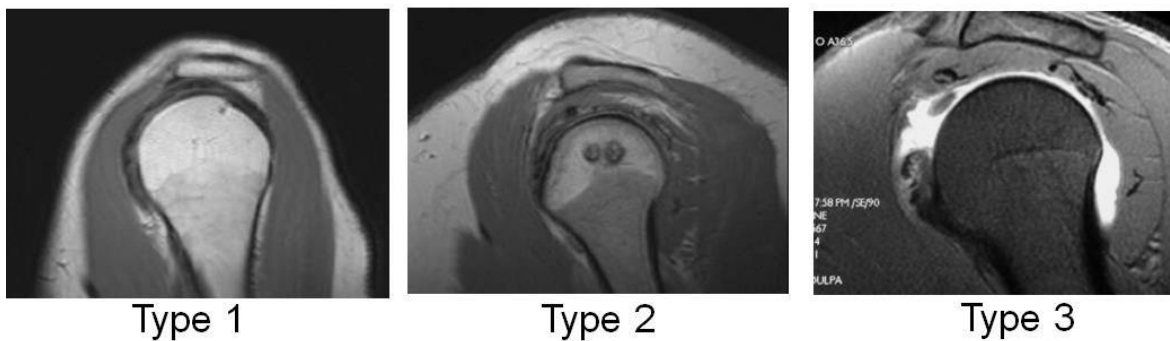
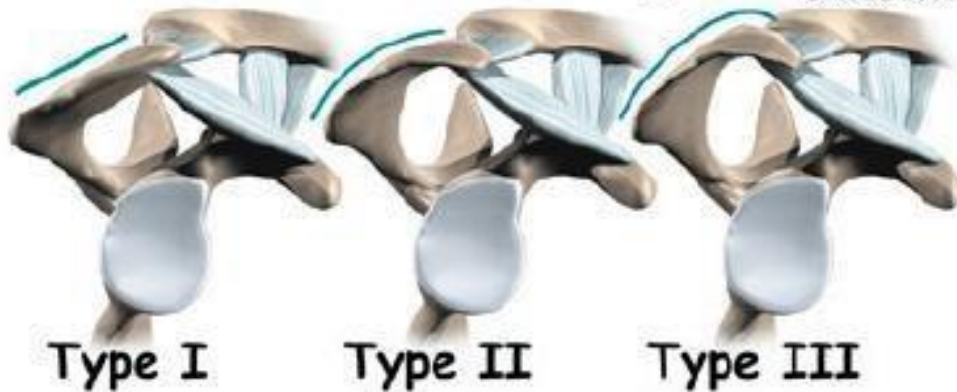
#AC joint:

Inferior osteophytes

Acromial morphology

### Variations in Acromion Shape

©MMG 2001



### Intrinsic Causes of SIS

**Weakness and damage to the supraspinatus.**

- Degenerative changes or trauma weaken the supraspinatus
- No longer able to center the humeral head on the glenoid.
- Humeral head migrates superiorly
- Subacromial space narrows
- Abutting the tuberosity and cuff against the undersurface of the acromion.

### Diagnosis

Accurate diagnosis of impingement requires:

**History- Physical examination - Imaging.**

## History

### Cuff-related symptoms:

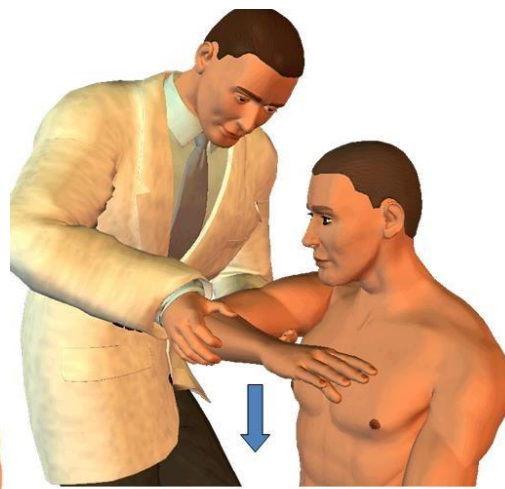
- # Anterolateral arm pain
- # Insidiously over a period of weeks to months.
- # Pain at night, exacerbated by lying on the involved shoulder, or sleeping with the arm overhead.
- # Exacerbation of symptoms is frequently reported with:
  - shoulder elevation at or above 90°
  - With lifting items away from the body
- # If associated with RCT → weakness ++

## Physical exam

- # If associated with RC tendinopathy (stage II) - Pain on resisted shoulder elevation (**Jobes test**)
  - Pain on resisted abduction and external rotation.
- # If associated with RCT (stage III)
  - Weakness +++
  - # **Neer and Hawkins tests** are typically used to evaluate for evidence of impingement, and these tests may be sensitive, but not specific.
  - # **Neither the Neer nor the Hawkins sign** had diagnostic utility for impingement



Neer's impingement sign .



Hawkin's impingement test.

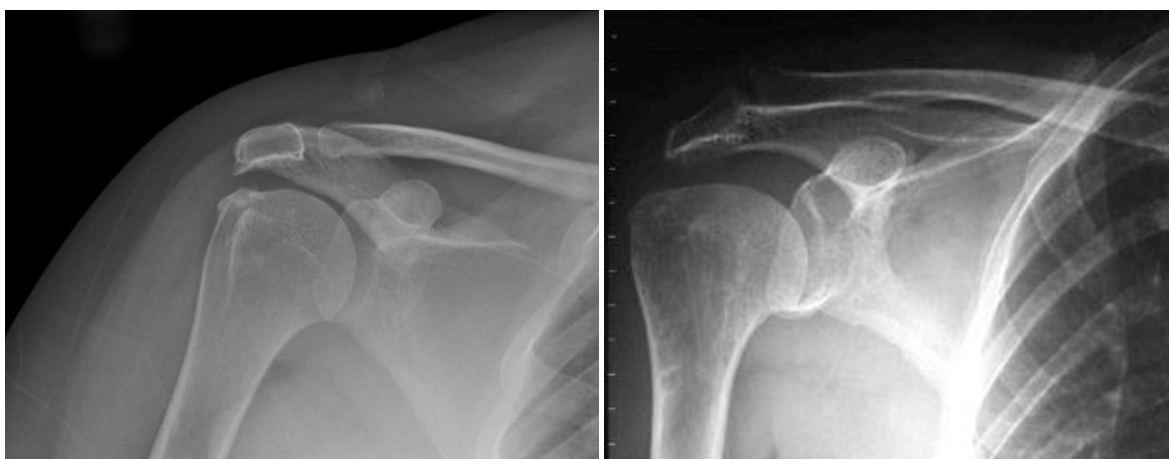
## Imaging

# Plain X-rays:

- Acromial spurs
- AC joint osteophytes
- Subacromial sclerosis
- Greater tuberosity cyst

# However, all of these findings may be present in **asymptomatic subjects**

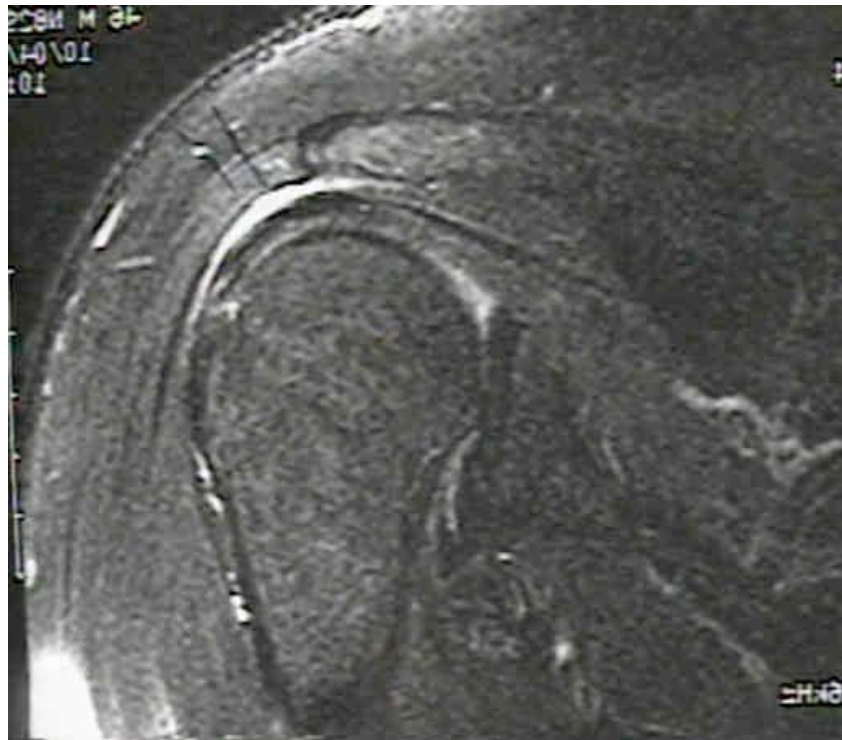
“Acromiohumeral distance (N=7-14mm) better reflected the clinical status of patients with subacromial impingement than did acromial shape”





### # MRI

- Ossification of the CAL
- Subacromial spur
- Bursal thickness >3 mm
- The presence of fluid medial to the AC joint or anterior aspect of the bursa
- Rotator Cuff pathology (if I suspect RC tear)



### Management (Stages I & II)

#### # **Conservative treatment (+++):**

- **Always start with it**
- For most patients with SIS, nonsurgical treatment is successful.

#### **Operative:**

Surgery is indicated in patients with **persistent pain** who **fail** a trial of **nonsurgical treatment**

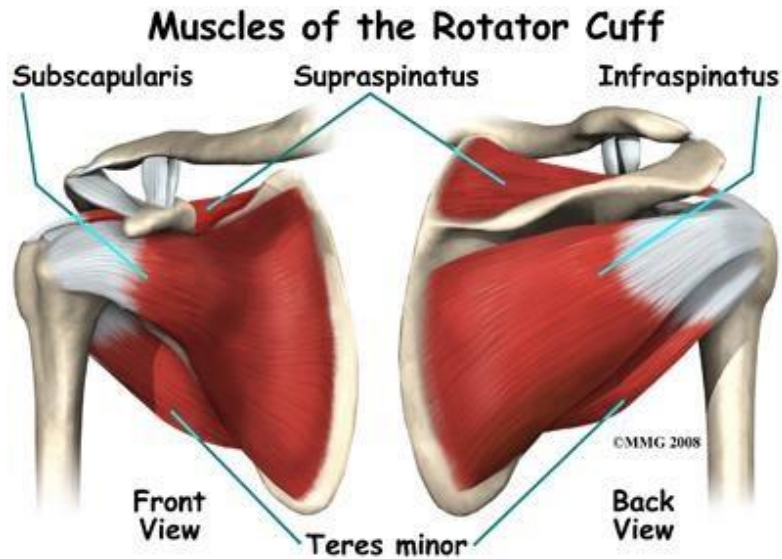
**Conservative treatment** (Avoid painful and overhead activities, Physiotherapy, NSAIDs, Steroid injection into the subacromial space)

**Arthroscopic subacromial decompression:**

- for Extrinsic causes.
- types of surgeries:
  - Acromioplasty - Bursectomy - CAL release

\*There is no evidence from the available RCTs for differences in outcome in pain and shoulder function between conservatively and surgically treated patients with subacromial impingement syndrome. **BE CONSERVATIVE!!**

## 2- Rotator Cuff:



### Supraspinatus

# Function < Initiates abduction, Concavity-compression, Prevents  
 ↑ HH migration. **Most common tear.**

### Infraspinatus

Primary ER. Test with arm at side. 2nd most common tear (after  
 Supra)

### Subscapularis

# Footprint (Inserts on LT, Adjacent to LHB/Groove, Fibers blend  
 with CHL)

# Function < **Strongest muscle**, Primary IR, Lift-off/belly press/IR  
 Lag.

### Teres minor

Function < Ex. Rotation

# Cuff tear – Etiology

## 1- Extrinsic causes

- # Type III Acromion/AC osteophyte/sclerosis may be age-related
- # Precursor to RCT
- # Subacromial space
- # ↓ with ABD/IR
- # Associated with “partial” RCT

## 2- Intrinsic causes

- # Originates within tendon
- # Overload
- # Biology
  - Aging/Avascularity
  - ↑ Type III collagen
  - Smooth muscle Actin
  - Shear forces

## 3- Traumatic

- Shoulder dislocation (Age >40, **Assume RCT until proven otherwise**)
- A simple fall or trying to catch or lift a heavy object can cause RCT.

## Symptoms

- # Pain is the predominant symptom
  - Often most troubling at night and with overhead activities.
  - Painful arc of motion
- # Stiffness
- # +/- apparent or real muscle weakness.
- # Partial tendon lesions are often much **more painful** than full thickness tears.

# Rotator cuff integrity

## Subscapularis

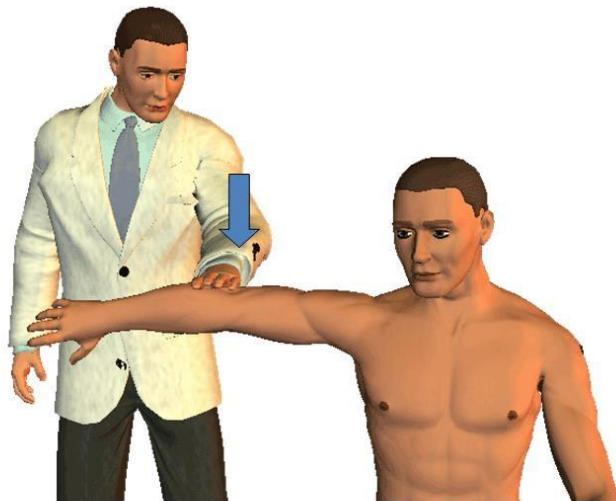


Belly Press Test



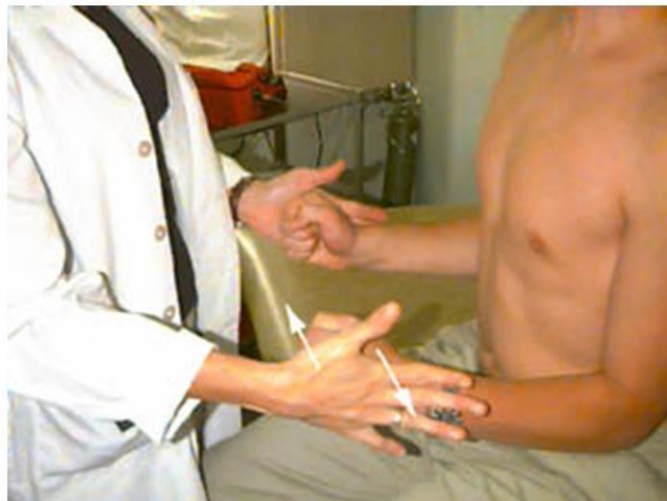
Lift-off Test

## Supraspinatus

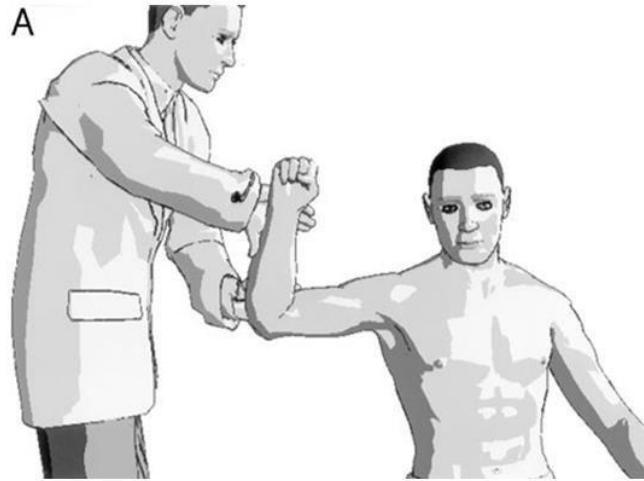


Jobe test

## Infraspinatus



# Teres minor



## Imaging

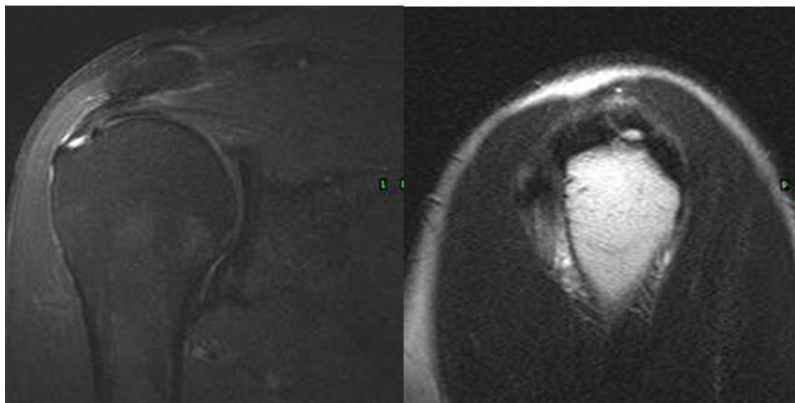
# MRI

# US

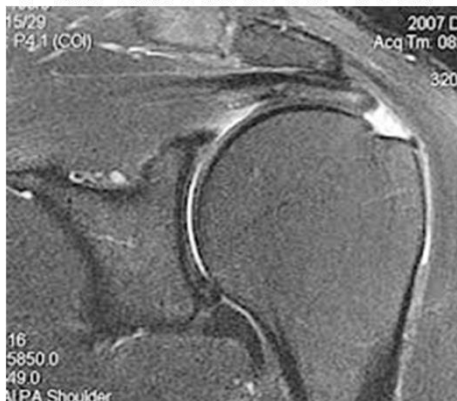
Sensitivity of 84% and a specificity of 96%.

Best for RC evaluation.

## Partial Tear



## Full thickness Tear



Do we need to treat asymptomatic elderly patient with an MRI reported RCT? **No. Only symptomatic patient**

### Natural history

# Most partial tears do not heal on their own.  
# Partial tears progress to become larger rather than smaller with time. #  
If chronic and irreparable → **rotator cuff arthropathy (massive tear 2 or more tendons)**



## Non-operative treatment

- **Indications:**
  - All partial thickness tears
  - Full thickness tear:
    - Chronic +degenerative
    - **Elderly low demanding + not active**
- **Options:**
  - Activity modification
  - NSAID
  - Physical therapy
  - Range of motion

- **Strengthening of the rotator cuff and periscapular musculature**
- **Corticosteroid injections**

## **Surgical treatment**

- **Indications:**

- **Acute traumatic tear**
- **Failed non- operative treatment**
- **Full thickness tear in (Acute, Young, painful and old but active patient)**

- **Options:**

- **Associated with extrinsic causes: treat like SIS**
- **Debridement only (<50% partial thickness tear)**
- **Rotator cuff repair (Arthroscopic or open)**

**Complications:** Recurrent tear (or non-healing), Stiffness infection

## **3- Adhesive Capsulitis:**

# It is characterized by painful, gradual loss of active and passive shoulder motion resulting from fibrosis and contracture of the joint capsule.

# **“frozen shoulder” is nonspecific description and should not be used as a diagnosis’ term**

# 3–5% in the general population and up to 36% in those with **diabetes.**



## Pathogenesis

### Idiopathic (so called primary)

# Chronic inflammation of the capsule subsynovial layer produces capsular thickening, fibrosis, and adherence of the capsule to itself and to the anatomic neck of the humerus.

### Secondary adhesive capsulitis

Many conditions can produce symptoms similar to those of adhesive capsulitis like: -Rotator cuff tears

- Calcific tendinitis
- Glenohumeral or acromioclavicular arthritis
- Cervical radiculopathy.

In these conditions, motion loss is typically multifactorial rather than the result of isolated capsular restriction

**Better to use the term: “Stiff and painful shoulder”**

### Association conditions (Risk factors) Important

Women 40-60 years	Thyroid dysfunction (hypo & hyper)
Cervical spondylosis	Breast cancer treatment
Cerebrovascular accident	Cardiovascular disease / MI

**Diabetes mellitus (Diabetes is associated with a significantly worse prognosis, greater need for surgery, and suboptimal results).**

## Clinical presentation

### # Pain

- Insidious onset of several months' duration. - The onset of symptoms tends to be more gradual - Commonly referred to the origin of the deltoid.
- Night pain is common
- patients typically cannot sleep on the affected side.

\*Pain following repetitive overhead activity is not a typical feature

→ **think about other pathology**

**# Loss of motion**

- With or after the onset of the pain, rarely before.
- Progressively worse with time
- Patients have difficulty dressing, combing their hair, reaching to a back pocket, or fastening a brassiere.

<b>Clinical Stages</b>		
<b>Freezing stage</b>	<b>Frozen stage</b>	<b>Thawing stage</b>
<ul style="list-style-type: none"> <li>- <b>Pain+++ / Hot++</b></li> <li>- <b>ROM mildly limited</b></li> <li>- <b>(3-9 Ms)</b></li> </ul>	<ul style="list-style-type: none"> <li>- <b>Pain decrease</b></li> <li>- <b>ROM more restricted</b></li> <li>- <b>(4-12 Ms)</b></li> </ul>	<ul style="list-style-type: none"> <li>- <b>Slow improvement in ROM</b></li> <li>- <b>(12-42 Ms)</b></li> </ul>
<p><b>Physical exam</b></p> <p><b>#A mechanical restraint to passive motion is the hallmark of adhesive capsulitis</b></p> <p>#This finding is best appreciated on passive external rotation with the arm at the side.</p> <p>#In early stage, <b>painful ROM++</b></p>		<p><b>Investigations</b></p> <p><b># Mainly clinical diagnosis</b></p> <p># To rule out other pathologies # Most of the time → normal investigations</p> <p># X-ray &lt; Disuse osteopenia</p> <p># MRI &lt; Thickening of the joint capsule and diminished filling of the axillary pouch</p> <p style="text-align: center;"><b>The diagnosis of adhesive capsulitis is often one of exclusion.</b></p>

\*Be careful... **Must rule out missed dislocation.**

## Treatment

### Mainly conservative:

# Physical therapy combined with a home exercise program is the mainstay of treatment, regardless of stage.

-Gentle progressive stretching

# Patients should be counseled that they face a prolonged recovery period.

#Adjunct to PT: (NSAID, Steroid injections)

**Self-limiting disorder that resolves in 1–3 years**

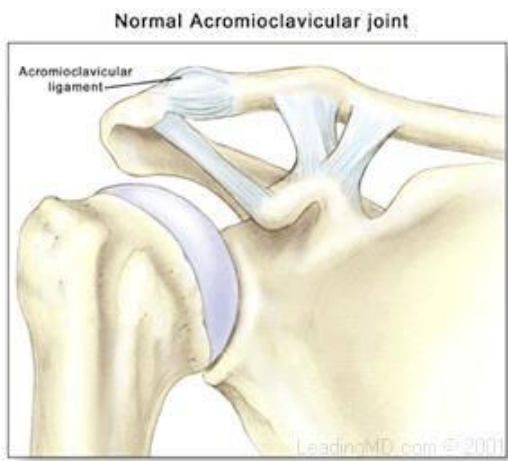
### **Surgical:**

# Rarely needed

# If no improvement after 6 months of therapy

# Options: (Manipulation under anesthesia, Arthroscopic capsular release)

## 4- AC joint common conditions:



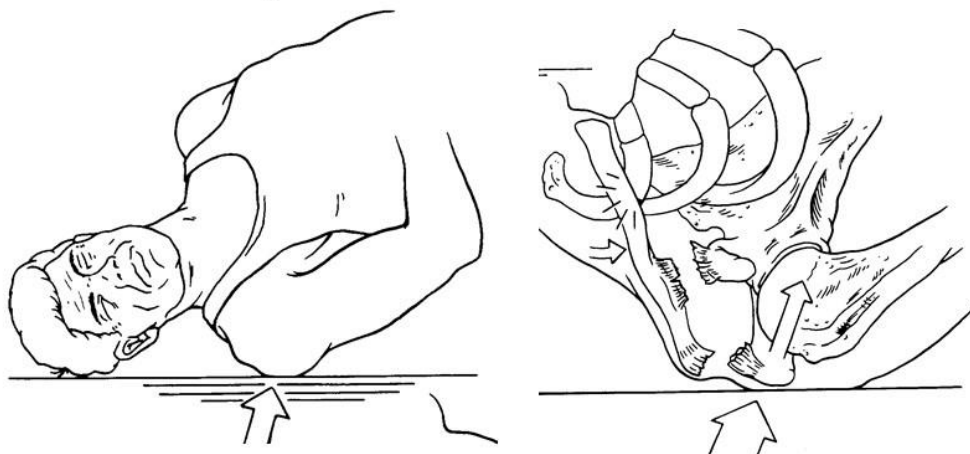
# Traumatic AC joint separation/dislocation

# Osteoarthritis

# Osteolysis of distal clavicle

## Traumatic AC joint separation/dislocation

Almost always a direct blow or fall onto acromion



### Treatment:

**Conservative:** partial dislocation

**Surgical:** complete dislocation



## Painful Conditions of the Acromioclavicular Joint

### # Primary Osteoarthritis

- Most common cause of pain in the AC joint
- 50 % of elderly **asymptomatic** Pts may have radiological evidence of OA

### # Post-traumatic Arthritis

## # Distal Clavicle Osteolysis

- Repetitive microtrauma
- Weight-lifting athletes

## X-ray

AC OA



Distal clavicle osteolysis



## Treatment

### # Conservative (main treatment)

- activity modification
- NSAID
- Corticosteroid injections
- physical therapy

### # Surgical

- Failed non-operative measures
- Distal clavicle resection

## 5- Shoulder dislocation:

Acute dislocation is a surgical emergency and demands urgent relocation.

## Shoulder Dislocation



- # The shoulder joint has the greatest ROM of any joint in the body.
- # It relies on soft-tissue restraints, including the capsule, ligaments, and musculature, for stability.
- # Therefore, this joint is at the highest risk for dislocation.

**Most frequently dislocated large joint of the body**

## Classification

### Atraumatic

- # Multidirectional instability
- # Generalized ligamentous laxity
- # Bilateral
- # Responds well to nonsurgical management.

### Traumatic

- # 96%
- # Unidirectional
- # further classified by the direction of the humeral head dislocation:

- **Anterior**
- Posterior
- Inferior

## Acute Anterior Traumatic Shoulder Dislocation

### # Mechanism of injury

Violent external rotation in abduction levers the head of the humerus out of the glenoid socket, avulsing anterior bony and soft tissue structures in the process (the Bankart lesion)

## Clinical presentation

#Patient is in pain+++

# The arm is usually held in an abducted and externally rotated position.

# There is loss of the normal contour of the deltoid # Acromion is prominent posteriorly and laterally.

# The humeral head itself may well be palpable anteriorly.



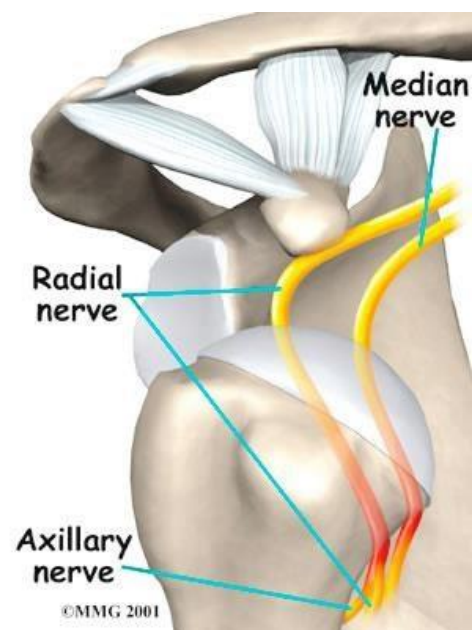
## Neurological assessment

# Neurological injury → 13%

# Axillary nerve

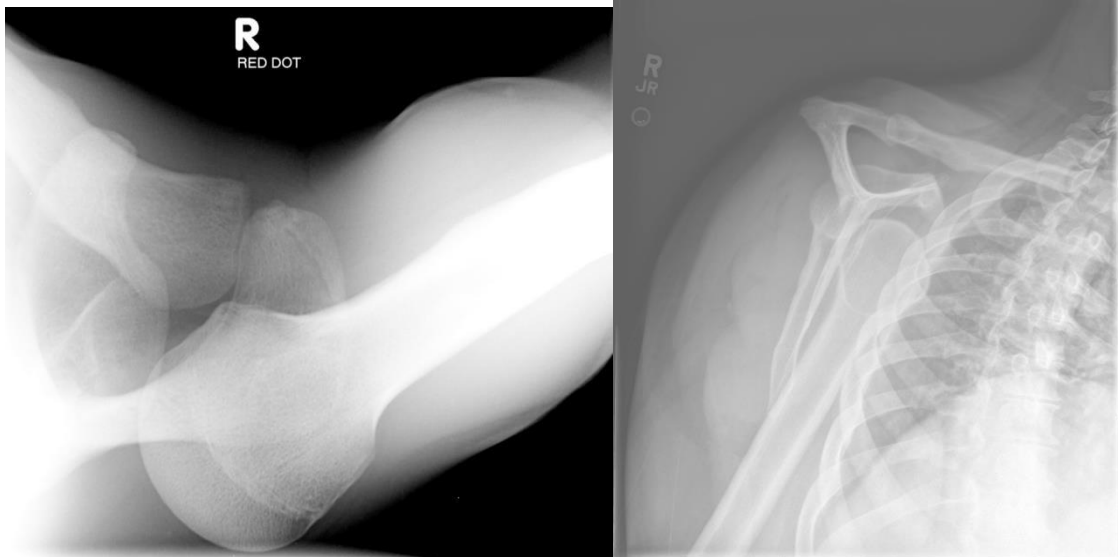
-Deltoid weakness or numbness over the anterolateral shoulder.

- Normal sensation **does not exclude** axillary nerve injury.



## Radiological evaluation

**You must obtain an AXILLARY view!**



## Acute management

1. R/O other injuries (ATLS)
2. Clinical assessment
3. Neurovascular examination
4. X-ray
  - AP+ Scapular Y+ Axillary views
  - R/O fracture dislocation
5. **Immediate reduction at ER**
6. Re-check neurovascular
7. X-ray (you must confirm the reduction on **Axillary view**)
8. Shoulder Immobilization
9. If no fracture → D/C home with analgesia and F/U at OPD



## Shoulder reduction steps

# Explain to the patient the procedure and the risks

# Analgesia

# +/- sedation

- Must monitor the CV + respiratory

# Maneuvers

- More than 24 techniques reported

## What pre-medication regimen works best?

# Intra-articular lidocaine is preferred to IV sedation

- No difference in reduction success
- Shorter time in ER
- Fewer complications

(0.9% vs 16.4%)

## What is the Best Reduction Method?

# Over 24 Different Techniques Described

- Different Pre-medication
- Different Patient Populations
- Different Levels of Experience

## FARES Technique (Fast, Reliable, and Safe)

- No sedation or analgesics
- Gentle longitudinal traction Arm - moved into abduction with vertical oscillating movements
- After 90 degrees' abduction, arm moved into external rotation while abduction and oscillations



Fig. 2  
The physician holds the patient's hand while the arm is at the side, the elbow is extended, and the forearm is in neutral rotation. Next, the physician gently applies longitudinal traction and slowly moves the arm into abduction. Continuously performed, brief (two to three full "cycles" per second), and "short-range" (approximately 5 cm above and beneath the horizontal level) vertical oscillating movements accompany all stages of the reduction.

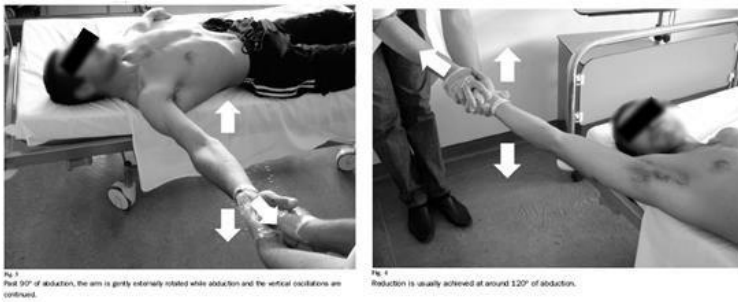


Fig. 1 Post 90° of abduction, the arm is gently externally rotated while abduction and the vertical oscillations are continued. Fig. 2 Reduction is usually achieved at around 120° of abduction.

## Is there an ideal reduction method?

- # Unknown - more data required
- # FARES technique > Hippocratic or Kocher
- # Seated without Sedation reduces ER time

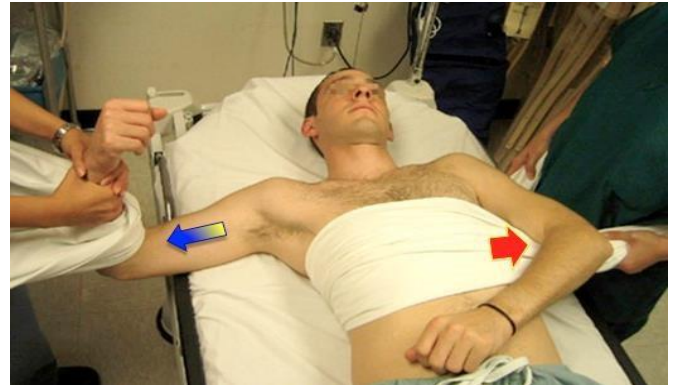
## Associated Injuries

- # RCT or fracture of the greater tuberosity → 33%
- Dislocation + Patients > 40 years → high risk of RCT (20-54%)
- # Neurological injury → 13%
- Axillary nerve → most common
- # Bankart lesions → 85%
- # Hill-Sachs lesion (an impaction fracture of the posterolateral humeral head on the glenoid rim) → 40-90%

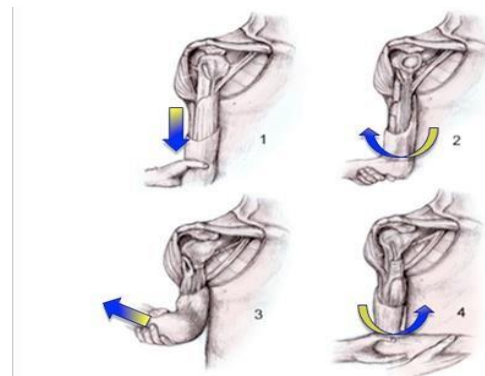
**Shoulder dislocation in patient >40 Y/O → get an MRI to R/O RCT**

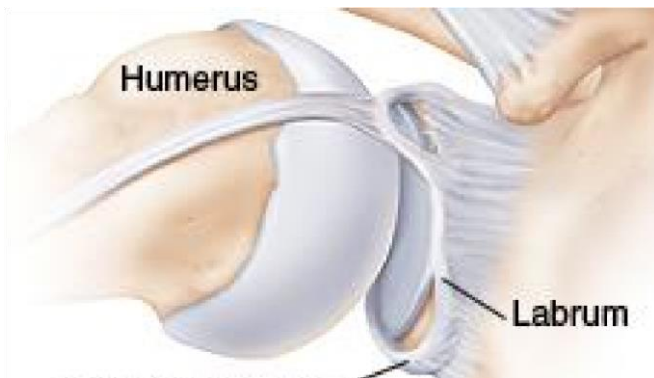
## Bankart lesions

Detachments of the anterior labrum from the glenoid rim

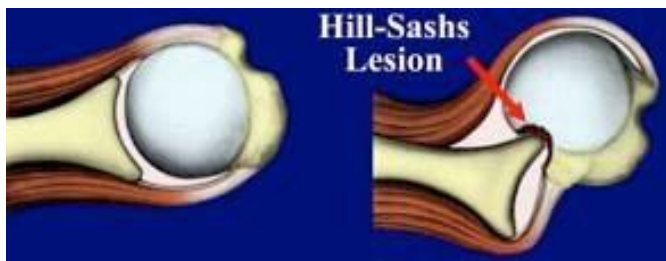


## Traction - Countertraction





## Hill-Sachs lesion



## Post-reduction rehabilitation

# The goal of rehabilitation is to regain maximum ROM while retaining stability.

# The affected arm can immobilize for a minimum of 1 to 4 weeks, and limited physical rehabilitation is recommended.

# physical therapy and immobilization **do not reduce the risk of recurrence.**

# **? ROM can be safely initiated within 1 week**

# **No benefit** of conventional sling immobilization for longer than **one week** for the treatment of primary anterior shoulder dislocation in younger patients

## Does immobilization reduce recurrence rates?

Immobilization in internal rotation does not affect recurrence  
(EBM)

Level I). Immobilization in external rotation **might** (EBM Level I&II)

**Age <30 = more important factor**

## When to request MRI or CT?

### # MRI

- 1- In patients with limited active ROM, weakness, or persistent pain 2 to 3 weeks after closed reduction.
- 2- Rotator cuff pathology is suspected (>40)
- 3- in cases of recurrent dislocation to evaluate for underlying pathoanatomy.

### # CT

Suspected bone loss (e.g., bony Bankart lesions)

## Complications of anterior Shoulder Dislocation

# Axillary nerve injury

# Rotator Cuff Tear

- Most common over age 40

# Greater Tuberosity Fracture

- DECREASES Risk of Recurrence

# Avascular necrosis of the head of the Humerus (high risk with delayed reduction)

# Recurrent shoulder dislocations/ instability

## Recurrent shoulder dislocations/ instability

Risk factors **AGE of Patient < 30 Y/O**

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