

Work-related shoulder pain

Dr JS Kirsten

Louis Leipoldt Medical Centre

Bellville

Introduction

- Work related conditions described since early 20th century
- Current tools for evaluation
 - Criteria document for evaluating work relatedness of UEMSD
 - (Sluiter 2001)
 - Comp Comm guidelines for WRULD

Introduction

- Shoulder pain origin in work environment
 - Subacromial bursa
 - Rotator cuff tendon
 - AC joint
 - Biceps tendon
 - C-spine
 - Brachial plexus

Introduction

- With proper history taking + physical examination diagnose
 - Rotator cuff syndrome
 - Radiating neck pain
- Relation to work questionable in
 - TUS
 - Symptoms from synovitis AC joint
 - Symptoms from spondilosis C-spine

Introduction

- Challenge
 - Locate origin
 - Prove relationship to work
 - Determine disability (temporary/permanent)

Rotator cuff syndrome

- Pain originating from
 - Rotator cuff tendon/s
 - Subacromial bursa
 - Biceps tendon
- Pathology range from
 - Reactive inflammatory process
 - Mechanical impingement under SA arch
 - Degenerative changes

Rotator cuff syndrome

- Bursitis
- Inflammation of subacromial bursa from mechanical irritation

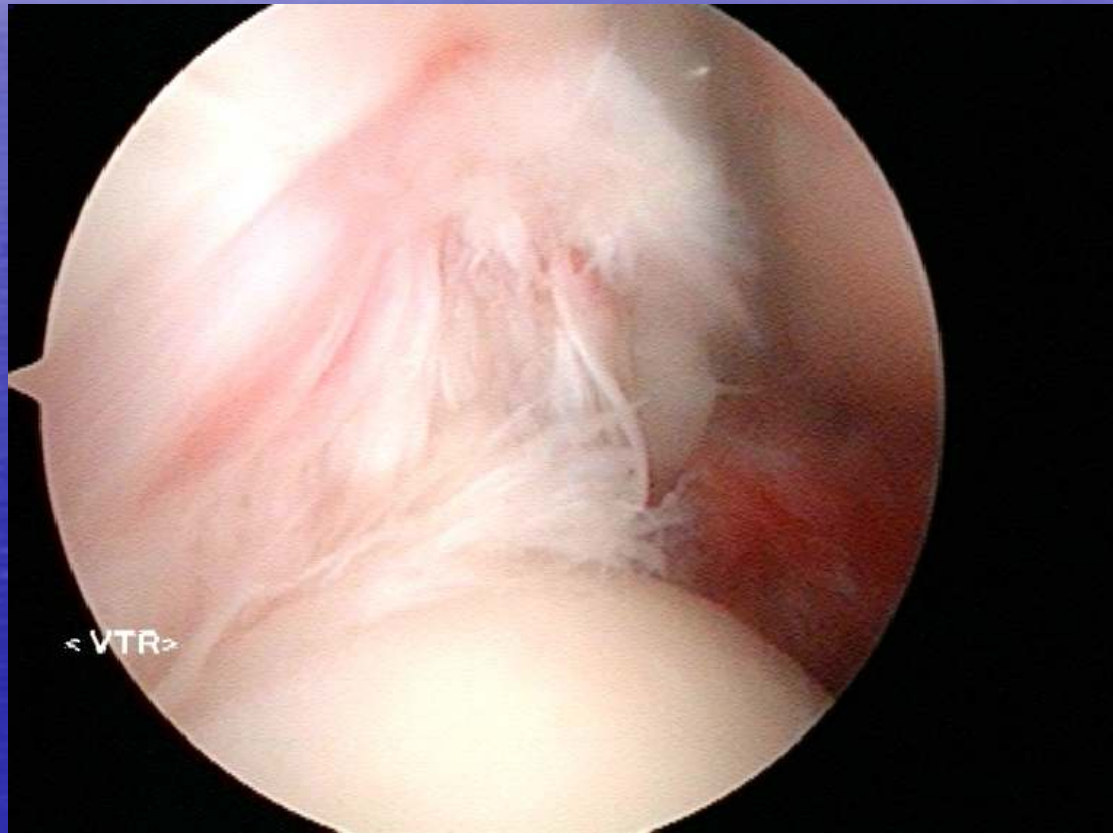
Rotator cuff syndrome

- Tendinitis
 - Inflammation of tendon



Rotator cuff syndrome

- Tendinosis
 - Degeneration of tendon
 - Articular side



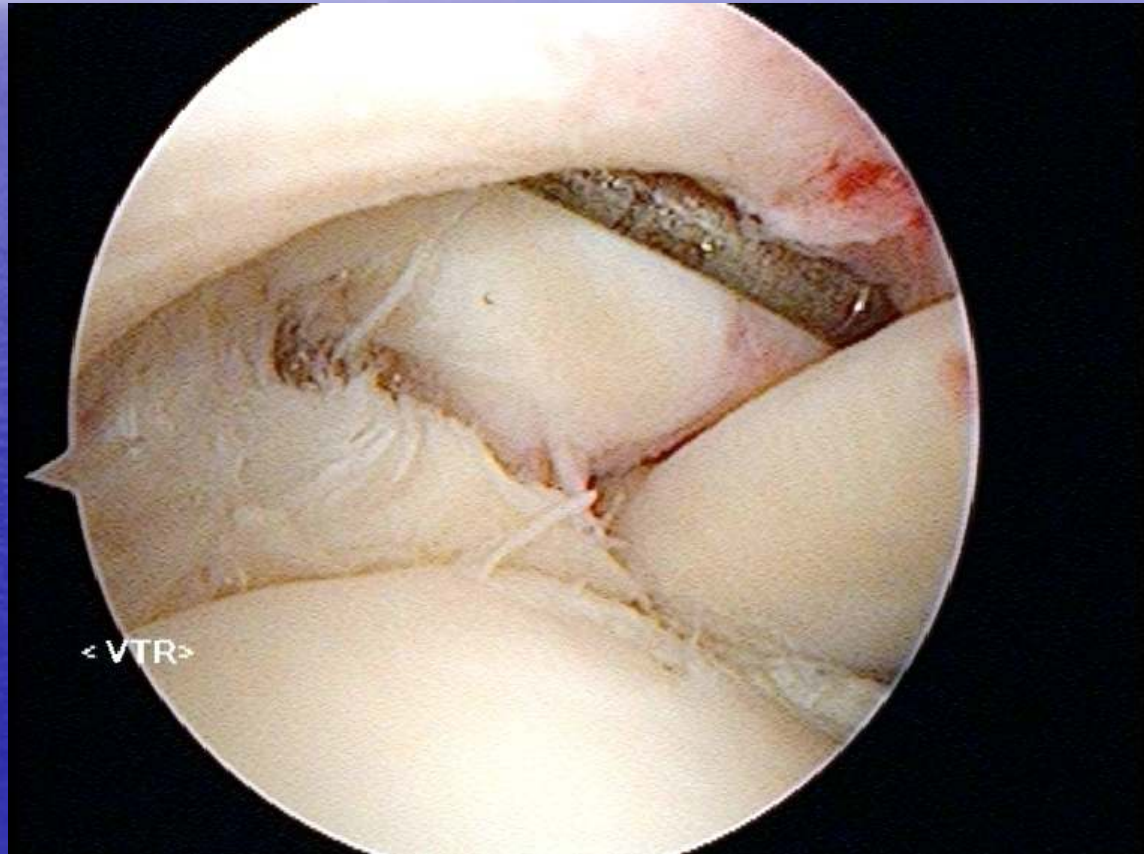
Rotator cuff syndrome

- Tendinosis
 - Bursal side



Rotator cuff syndrome

- Tear



Biomechanics

- Glenohumeral joint
 - Ball in socket
 - Different elements of movement active at the same time
 - Undesired ones canceled out by opposing muscles to allow desired action

Biomechanics

- Rotator cuff
 - Compress in head glenoid
 - Rotate head
 - Provide muscle balance during rotation
 - Provide stability while rest of shoulder girdle performs the motion

Impingement

- Mainly supraspinatus
- Lesser degree infraspinatus
- Three stages

Impingement

- Stage 1
 - Oedema
 - Hemorrhage
 - < 25yr
 - Reversible

Impingement

- Stage 2
 - Fibrosis
 - Tendinosis
 - 25 – 40yrs
 - Pain recurs with activity

Impingement

- Stage 3
 - Bone spurs
 - Tendon rupture
 - > 40 yrs

Pathology

- Ineffective contraction of rotator cuff muscle + upward pull of deltoid >
- Unbalanced force couples >
- Riding up of humeral head
- Compress cuff undersurface coraco-acromial arch

– Rockwood 2004

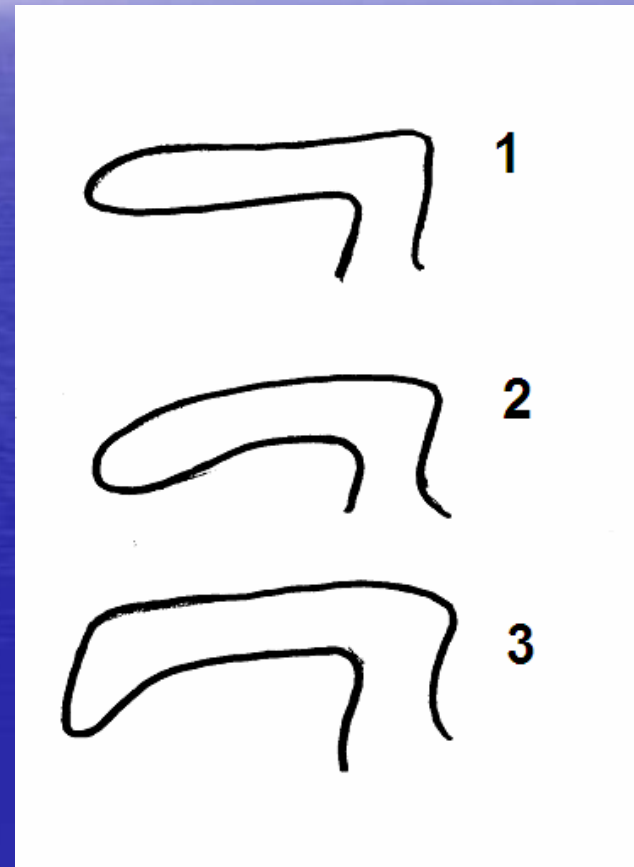
Pathology

- Tight posterior capsule >
- Eccentric rotation of head in glenoid
- Compress cuff undersurface coraco-acromial arch

– Cofield 1984, Harryman 1990

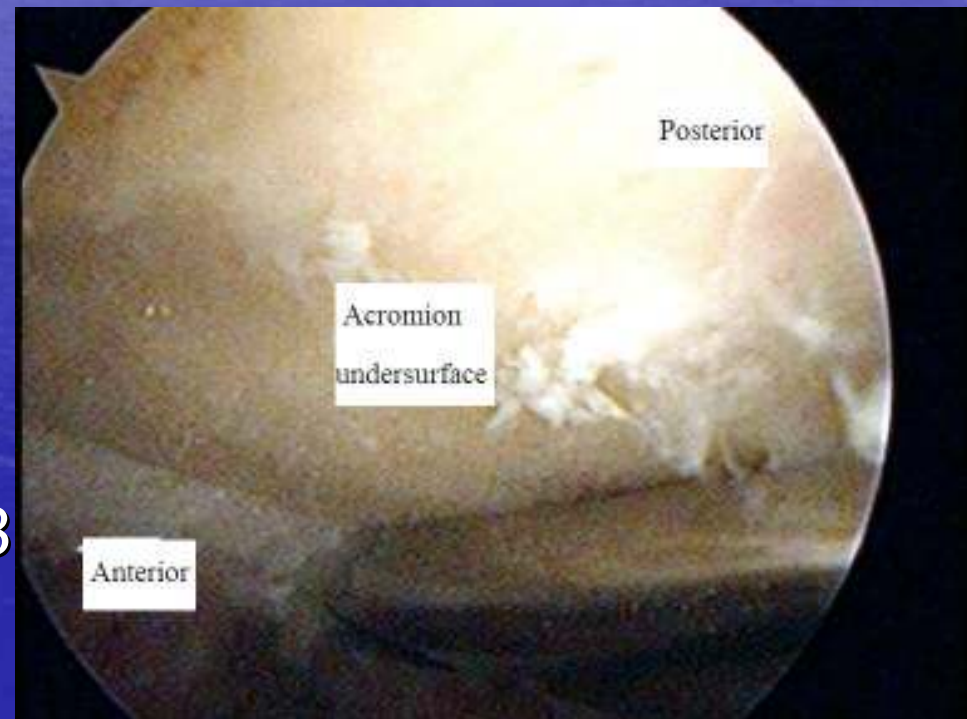
Pathology

- Shape of acromion correlates with incidence of tears
– Bigliani 1986



Pathology

- Results of arthroscopic acromioplasty closely correlates conversion of hooked to flat undersurface
– Morisson 1988



Pathology

- Tendon degeneration
 - Age related changes main reason
 - Pettersen 1942, Meyer 1931
 - Painless
- Calcification or rupture of tendon is painfull
 - Pettersen 1942

Pathology

- Cuff defects

- No clear association with strenuous physical work or heavy manual labour

– Neer 1983

- Age related

- uncommon < 40yrs

- 50-60 yrs incidence increases

- Relatively common > 70 yrs

– Meyer 1931

Occupation

- Assembly line workers
 - Probable relationship of some workload factors to upper limb disorders
 - Luopajarfe 1979

Occupation

- Higher incidence of shoulder pain
 - Repetitive use of tool/repetitive forceful movement eg. hitting
 - Arm above shoulder level for substantial period
 - Bending forward during work with arms
 - Use of vibrating tool??

– Leclerc 2004

Occupation

- Higher incidence of shoulder pain
 - Presence of depressive symptoms
 - Low level of job control by worker
 - Low social support

– Leclerc 2004

Symptoms

- Pain
- Muscle weakness
- Burning sensation
- Fatigue ability
- Stiffness

Signs

- Crepitis
- Muscle weakness
- Muscle spasm
- Decreased range of motion
- Tenderness

Rotator cuff syndrome

- Pain antero-lateral shoulder >
 - Deltoid region
 - Lateral arm
 - Lateral elbow
 - Anterior forearm

Rotator cuff syndrome

- Tenderness over greater tuberosity
- Subacromial crepitis that is painful



Rotator cuff syndrome

- Pain aggravated by abduction in scapular plane



Rotator cuff syndrome

- Weakness of supraspinatus



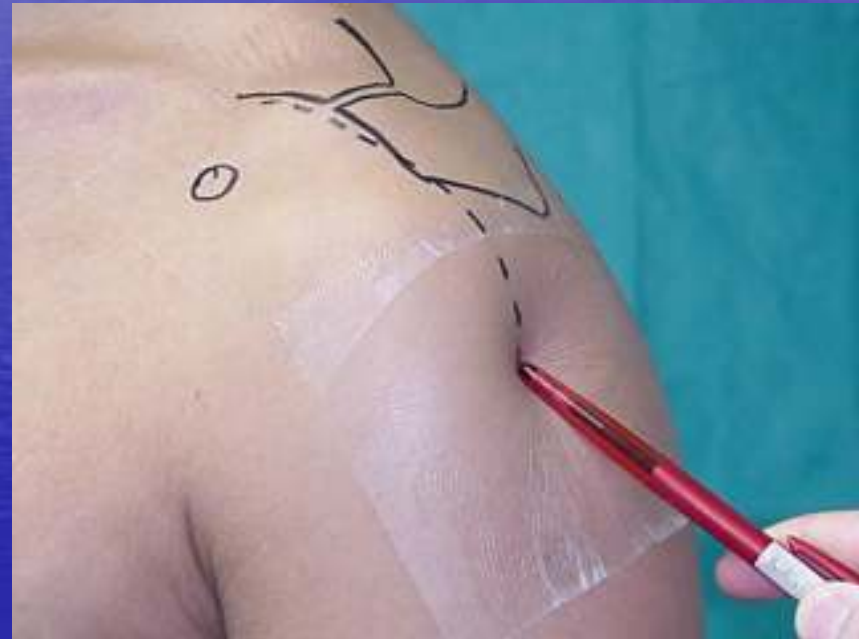
Rotator cuff syndrome

- Impingement test positive



Rotator cuff syndrome

- Lignocaine infiltration test positive



Rotator cuff syndrome

- Weakness of ER



Rotator cuff syndrome

- Tenderness over biceps tendon



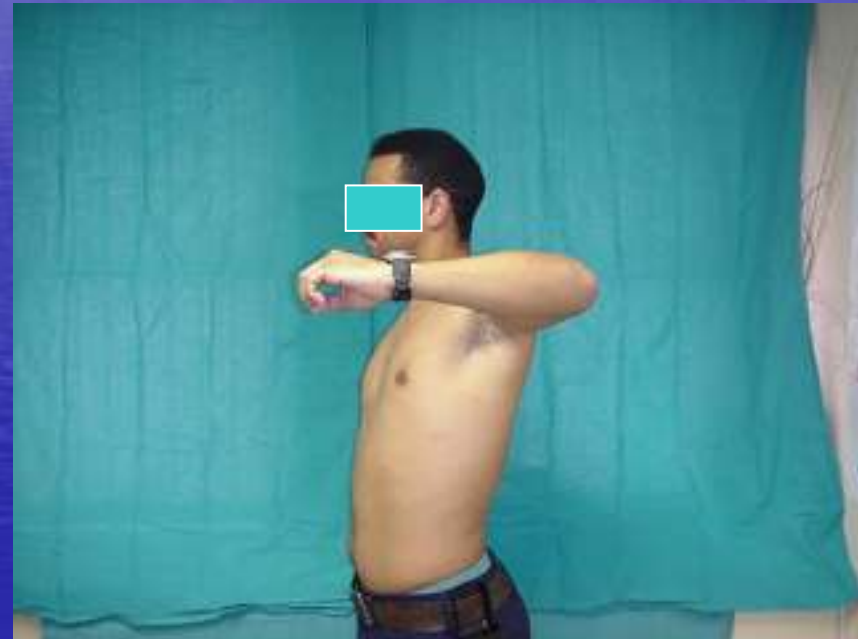
Rotator cuff syndrome

- Weakness of subscapularis



Rotator cuff syndrome

- Posterior capsular tightness



AC Joint

- Tenderness of AC joint



AC Joint

- Horizontal adduction pain over AC joint



Glenohumeral stiffness

- Limits the following:
 - Reaching behind head



Glenohumeral stiffness

- Limits the following:
 - Reaching behind back



Glenohumeral stiffness

- Limits the following:
 - Horizontal adduction



Glenohumeral stiffness

- Limits the following:
 - External rotation in neutral



Glenohumeral stiffness

- Limits the following:
 - Internal rotation in 90 degrees of abduction



Time Rules

- Symptoms for at least 4 days during course of a week over last 12 months since symptoms started
 - Sluiter et al, Criteria document for evaluating work relatedness of UEMSD.2001

Work relatedness of UEMSD

- Physical factors
 - Posture
 - Force
 - Movement
 - Time invoved

– Sluiter 2001

Work relatedness of UEMSD

- Posture

- Proximal muscles postural in nature
- Object further away from body >
- Greater muscle moment and –force >
- More recovery time needed

– Sluiter 2001

Work relatedness of UEMSD

- Force
 - 20% of max voluntary contraction requires 50% recovery time
 - i.e. 2 min requires 1 min
- Sluiter 2001

Work relatedness of UEMSD

- Movement
 - 2 - 4 repetitions per minute or
 - Cycles lasting at least 30 secs
 - More than half range of motion of joint
 - Sluiter 2001

Work relatedness of UEMSD

- Time involved
 - Posture and movement criteria more than 4 hours per day
 - Sluiter 2001

Work relatedness of UEMSD

- Non-physical factors
 - Work/rest ratio
 - Work tempo
 - Psychological demand
 - Deadlines and mental demands
 - Social support
 - Relationship with colleagues and supervisors
- Sluiter 2001

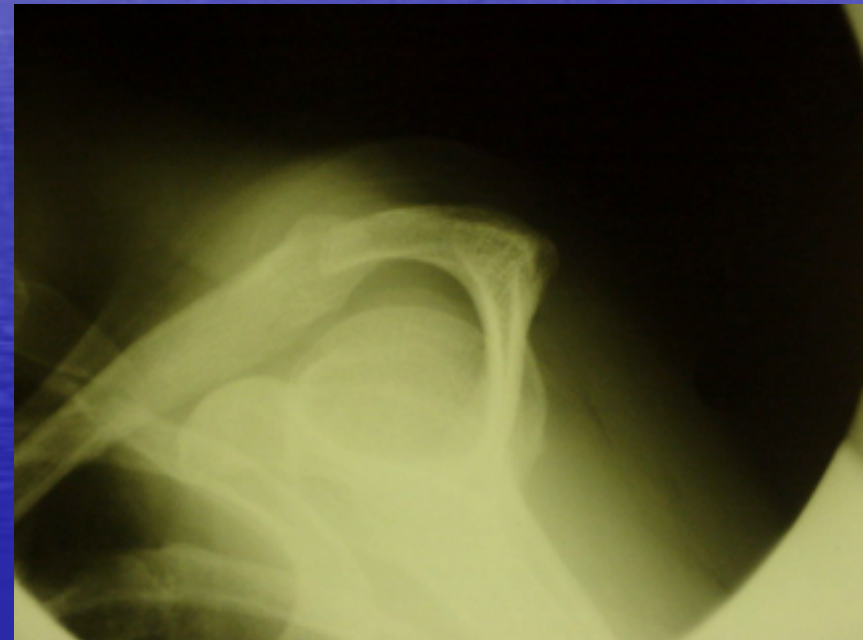
Risk of shoulder and upper arm disorders

- Hand behind trunk for
- Hand in front of opposite part of trunk
- Sustained external rotation of shoulder
- Sustained abduction (away from body)
- Hands moving above shoulder level
- Highly repetitive upper extremity movements
- Substantial part of day

● Sluiter 2001

Special investigations

- X-ray examination
 - Acromion



Special investigations

- X-ray examination
 - calcification



Special investigations

- X-ray examination
 - Degenerative changes GHJ



Special investigations

- X-ray examination
 - Degenerative changes ACJ



Special investigations

- Ultrasound
 - Subacromial fluid
 - Tendinosis
 - Small calcifications
 - Tear

Special investigations

- MRI
 - More sensitive and specific for soft tissue changes
 - Expensive

Management

- Physical treatment
 - Sling worn constantly 1-2 weeks
 - Taken off tds for mobility and strengthening exercises

Management

- Physiotherapy
 - Mobilize GHJ
 - Stretch posterior capsule
 - Strengthen RC, scapula retractors and - stabilizers

Management

- Work
 - Below shoulder level
 - Closer to trunk and centre of gravity
 - Reduce repetitive action
 - Objects of lower mass (less than 2 kg)
 - Resting periods in between

Management

- Medical
 - NSAIDS
 - Analgesics
 - Subacromial cortisone

Management

- Re-evaluate after 1 month
 - Reconsider diagnosis
 - Continue exercises
 - Repeat medication and cortisone subacromial
 - Continue work adjustment

Management

- Re-evaluate after 3 months
 - If symptoms return in original job > work evaluation > permanent job change
- Exclude neck pathology

Management

- Re-evaluate after 3 months
 - Indications for surgery
 - Cuff tear
 - Pt > 40yrs + persistent disability + positive lignocaine infiltration test
 - Refractory stage 2 impingement under 40yrs
 - Pt undergoing surgery for condition in which impingement is likely eg. fracture
 - Stiffness must be improved first
 - AC joint pathology

Management

- Re-evaluate at 6 months
 - Irreparable/permanent pathological changes
 - Secondary gain
 - Emotional factors
 - Work pressure
- Psychiatric evaluation

Management

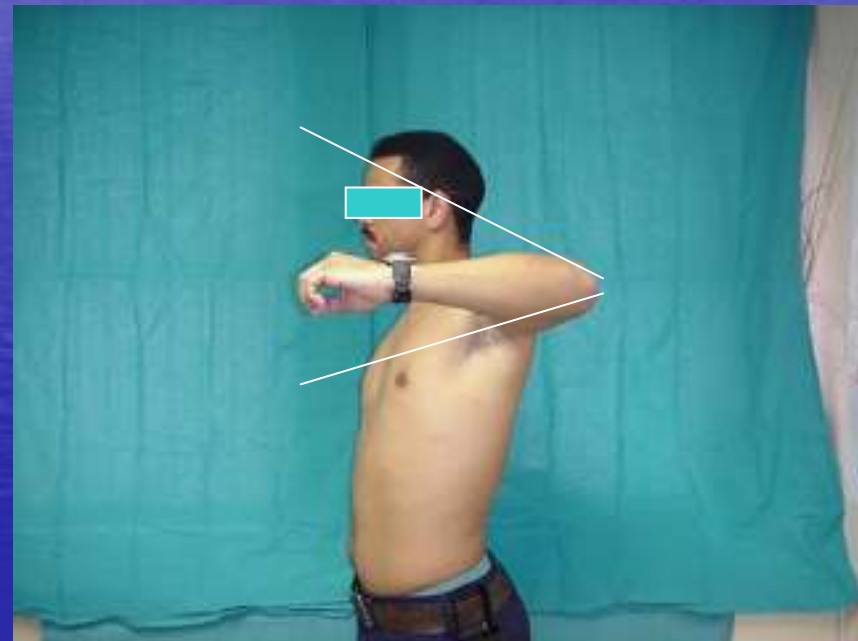
- 1 yr assesment
 - Condition stabilized
 - Permanent work adjustment

Work Changes

- Reduce
 - Repetitive movements
 - Power to complete task
 - Aids
 - 2nd worker
 - ergonomics
 - Extremes of reach
 - Static muscle loading
 - Cold exposure

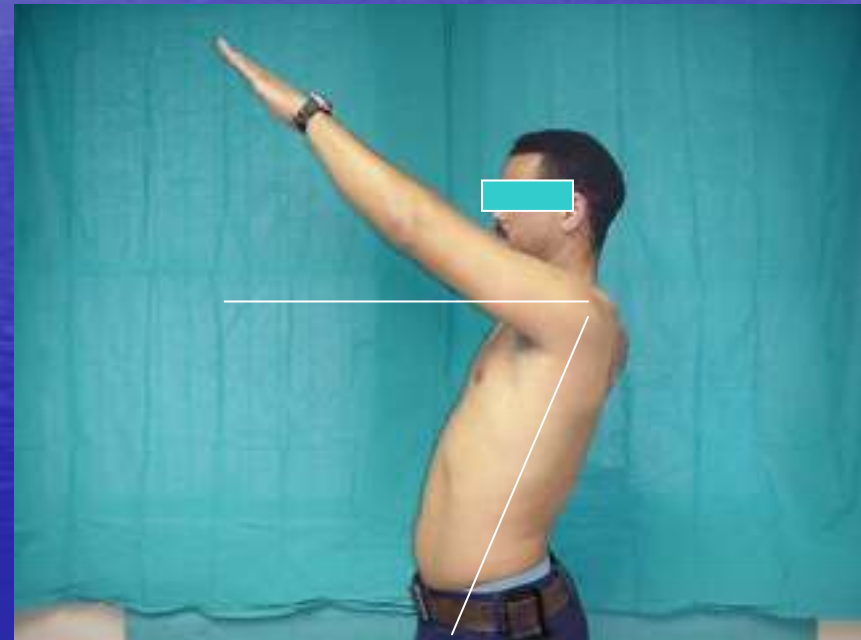
Work Changes

- Safe zones
 - 30 deg ER in abduction
 - 20 deg IR in abduction



Work Changes

- Safe zones
 - 30 - 90 deg of shoulder flexion



Work Changes

- Safe zones
 - 10 – 90 deg abduction



Conclusion

- Multidisciplinary approach
- Start with good history taking
- Sometimes end in psychiatric evaluation
- Often involves employer
- Always requires good communication with patient

Thank you

