Rehab from Bankhart Repair for Traumatic Anterior Shoulder Dislocation with Anterior Labral Tear

www.fisiokinesiterapia.biz

Mechanism of Injury

- Traumatic dislocation of the right shoulder
- Diagnosis: Traumatic right anterior shoulder dislocation with anterior labral tear
- Athlete wishes to resume his football career next season
- Athlete underwent Bankhart Repair

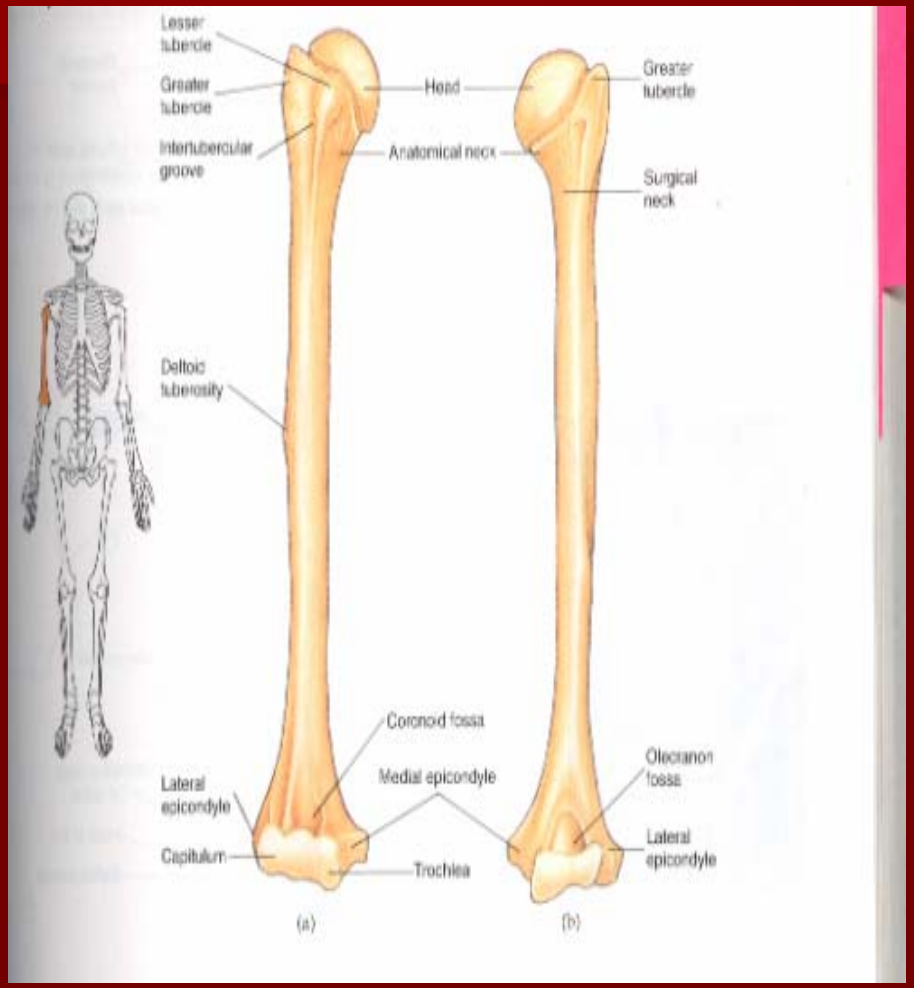
Surgery

- The Bankhart lesion is a specific injury to a part of the shoulder joint called the labrum
- When the labrum of the shoulder joint is torn, the stability of the shoulder joint is compromised
- The Bankhart lesion is located in a specific area of the labrum (anterio-inferior)
- Labrum is sutured back together and is tacked back around the fossa
- Immobilized for approximately 6 weeks
- http://orthopedics.about.com/library/glossary

Basic Anatomy

- Pictures from Gench

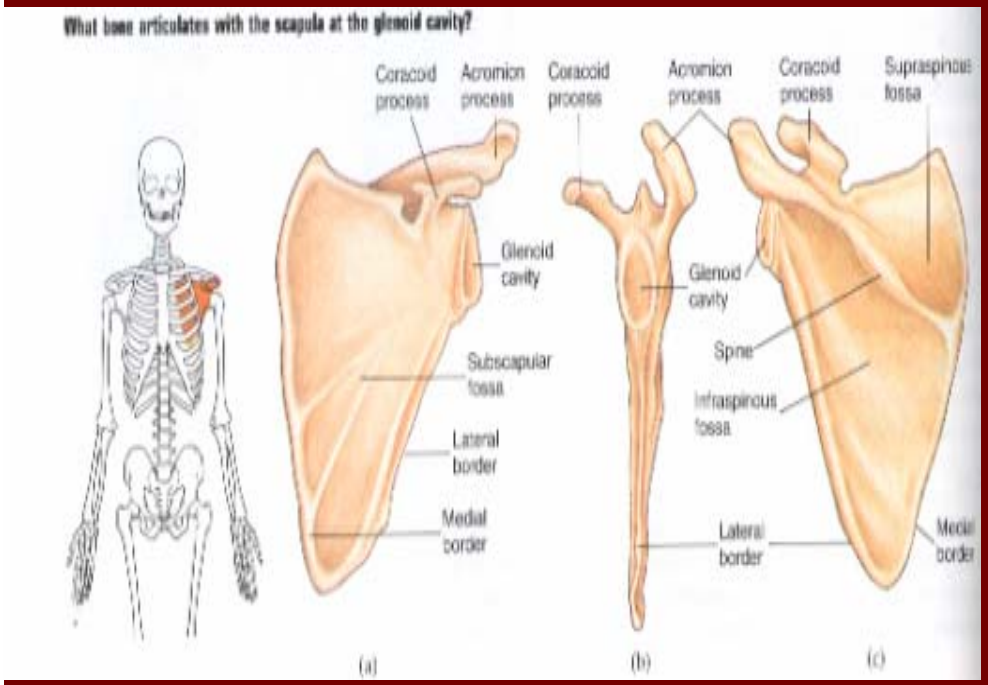
Bones and bone markings



Humerus

- Head
- Anatomical Neck
- Lesser tubercle
- Greater tubercle
- Intertubercular groove
- Deltoid tuberosity
- Wingerd 173

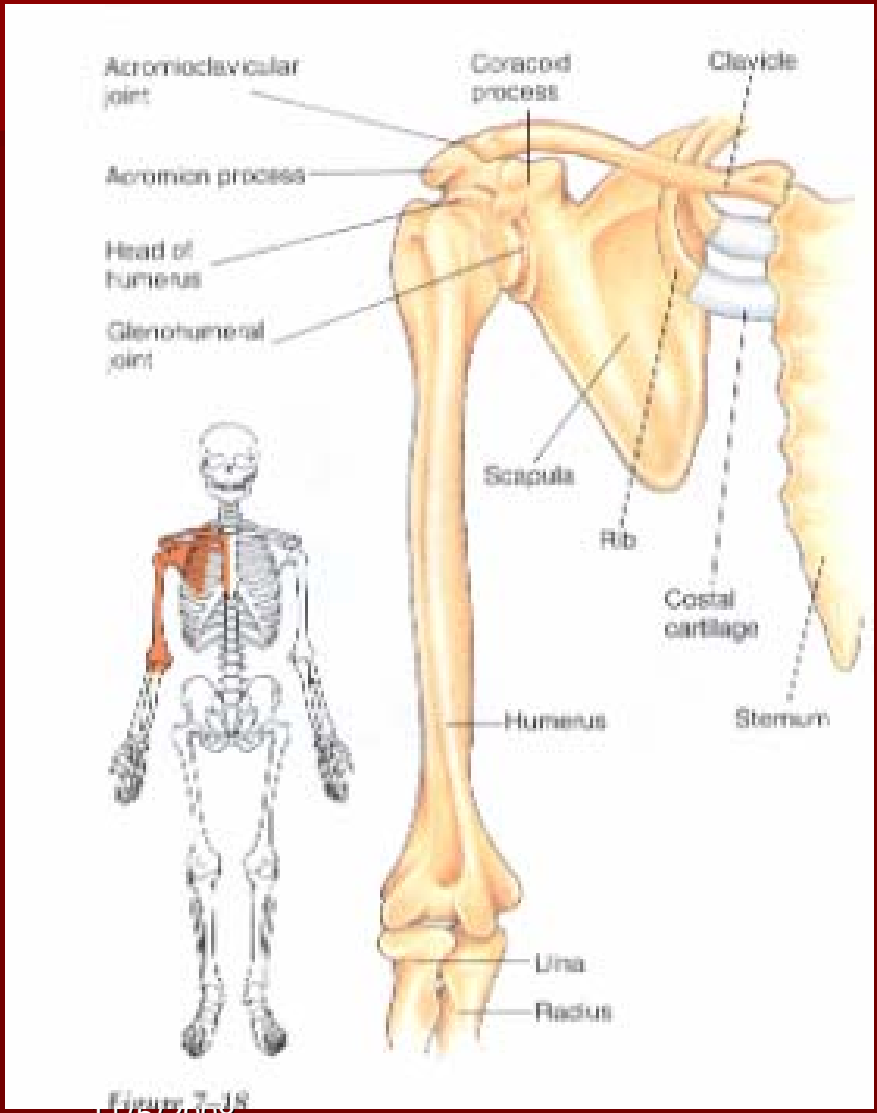
Bones and bone markings



Scapula

- Acromion process
- Coracoid process
- Glenoid fossa
- Subscapular fossa
- Lateral border
- Medial border
- Spine
- Supraspinous fossa
- Infraspinous fossa
- Wingerd 172

Bones and bone markings



- Clavicle
- Ribs
- Sternum
- Wingerd 172

Joints of the Shoulder

- Joint complex
  - A group of joints with a relatively high degree of functional interdependence
- Shoulder complex consists of 4 joints
  - Glenohumeral
  - Acromioclavicular
  - Sternoclavicular
  - Scapulothoracic
- Watkins 180

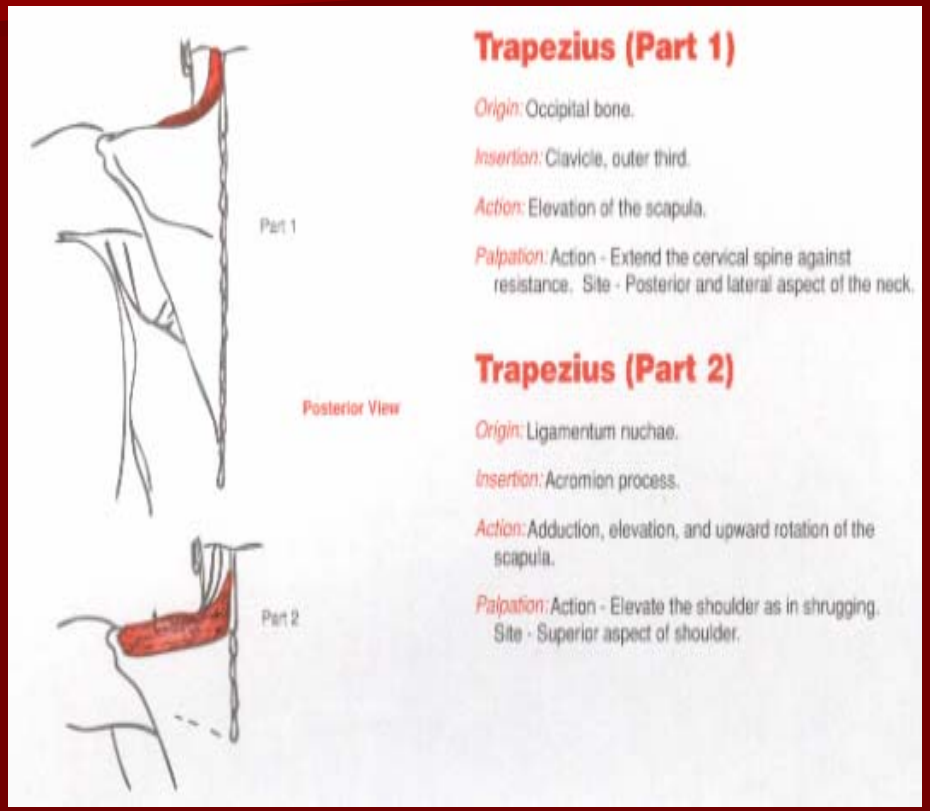
Glenohumeral joint

- Synovial ball and socket joint
  - Head of humerus is articulates with the glenoid fossa
- Glenoid fossa is approximately one-third the size of the head of the humerus
  - Fossa is area of articulation is increased by a ring of fibrocartilage called the glenoid labrum
- Watkins 181

Other joints

- Acromioclavicular
  - Synovial gliding joint
  - Articulation between the acromion process and distal end of the clavicle
- Sternoclavicular
  - Synovial joint that has sructural and functional characteristics of both saddle and gliding joints
  - Articulation between the manibrium of the sternum and the proximal end of the clavicle
- Scapulothoracic
  - Ability of the scapula to glide and rotate relative to the posterior aspect of the rib cage
- Watkins 183

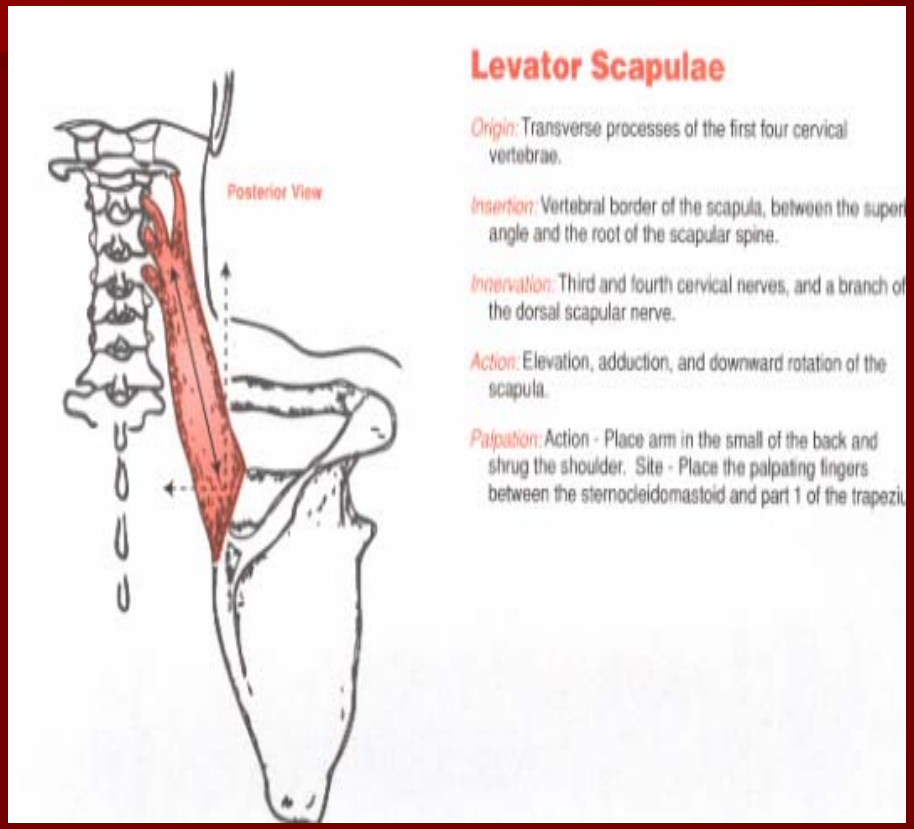
Musculature



Trapezius

- O-occipital bone and spines of the cervical and thoracic vertebrae
- I-acromion and spine of the scapula
- A-elevates and rotates the scapula
  - -adducts the scapula
  - -depresses the shoulder
  - -extends the head
- Wingerd 218

Musculature



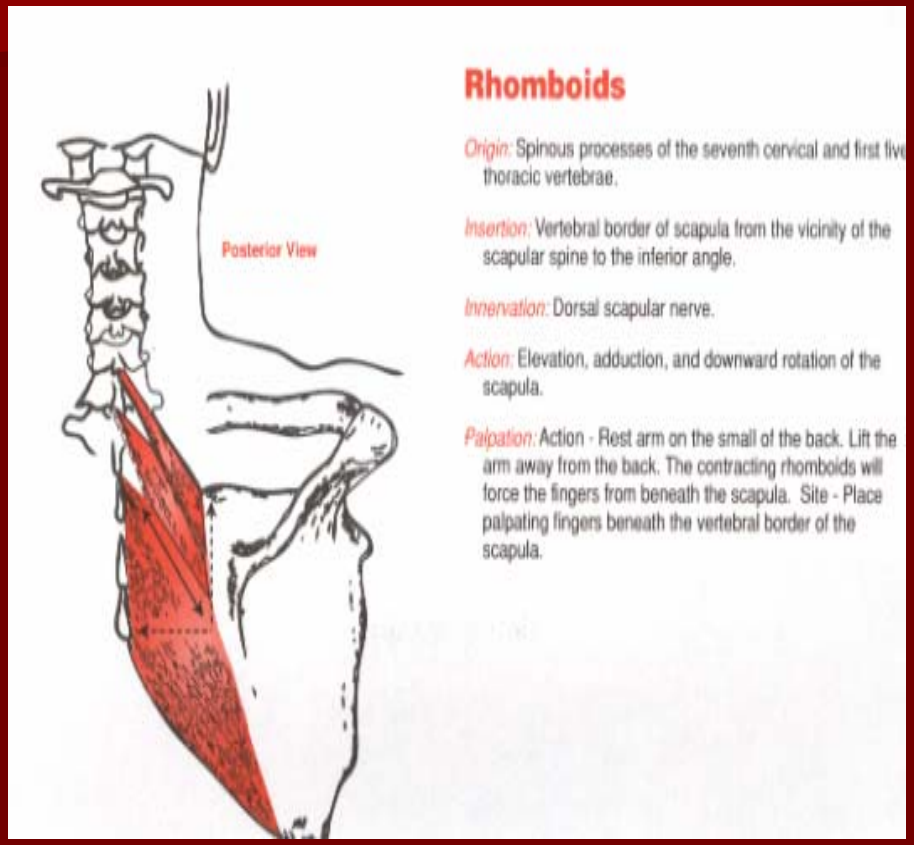
Levator scapulae

- O-first four cervical vertebrae
- I-Scapula
- A-elevate and adduct the scapula

  -flex the head to either side

Wingerd 218

Musculature



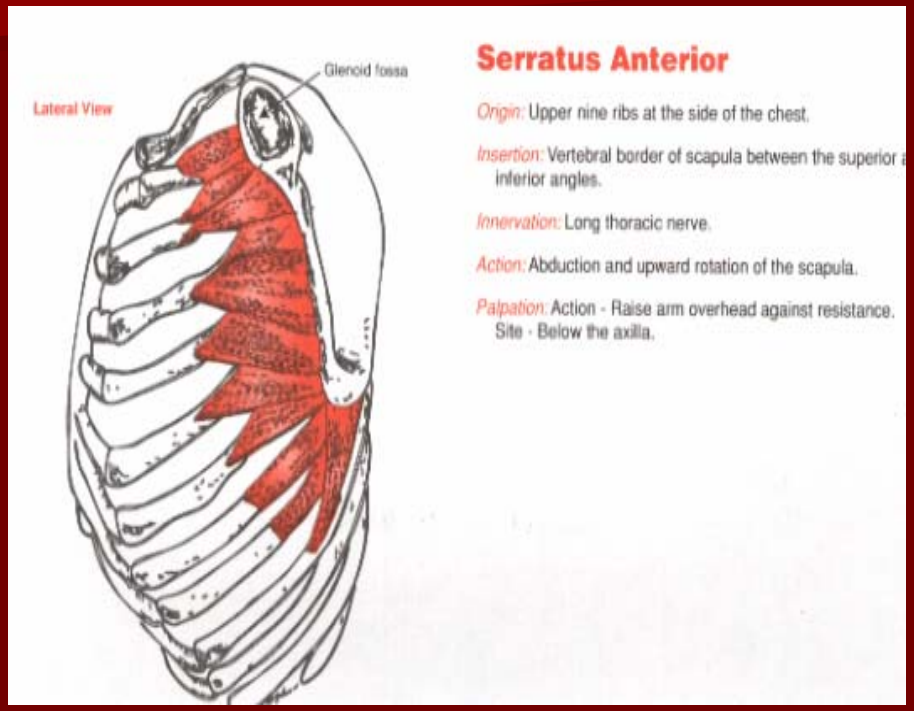
Rhomboids

- O-seventh cervical and first five thoracic vertebrae
- I-scapula
- A-adductthe scapula to square the shoulder

  -rotate scapula as in paddling a canoe

Wingerd 218

Musculature

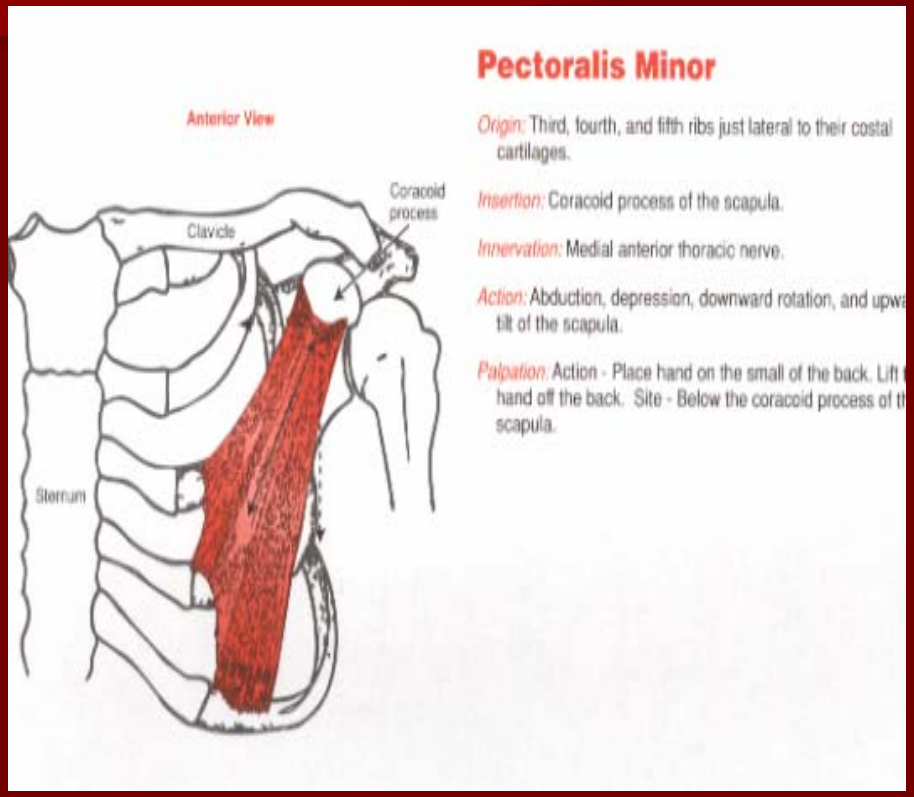


Seratus anterior

- O-first eight ribs
- I-scapula
- A-abduct the scapula
  -rotate the scapula

Wingerd 218

Musculature



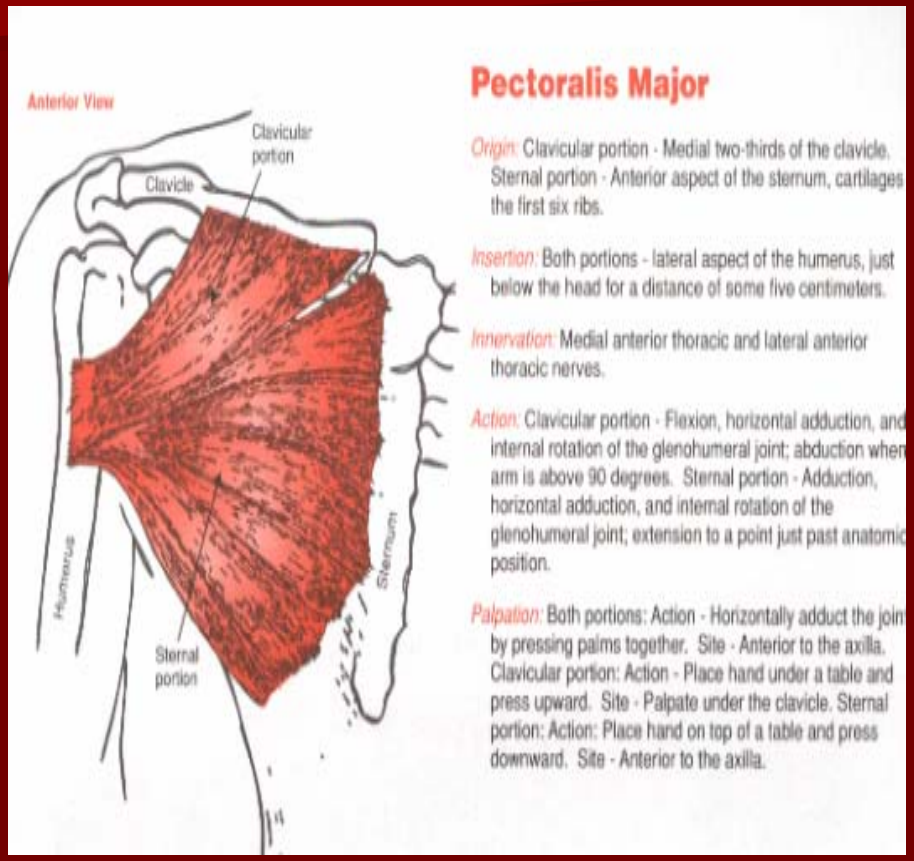
Pectoralis minor

- O-ribs 3 through 5
- I-scapula
- A-draws the scapula forward and downward

  -elevates the ribs

Wingerd 218

Musculature



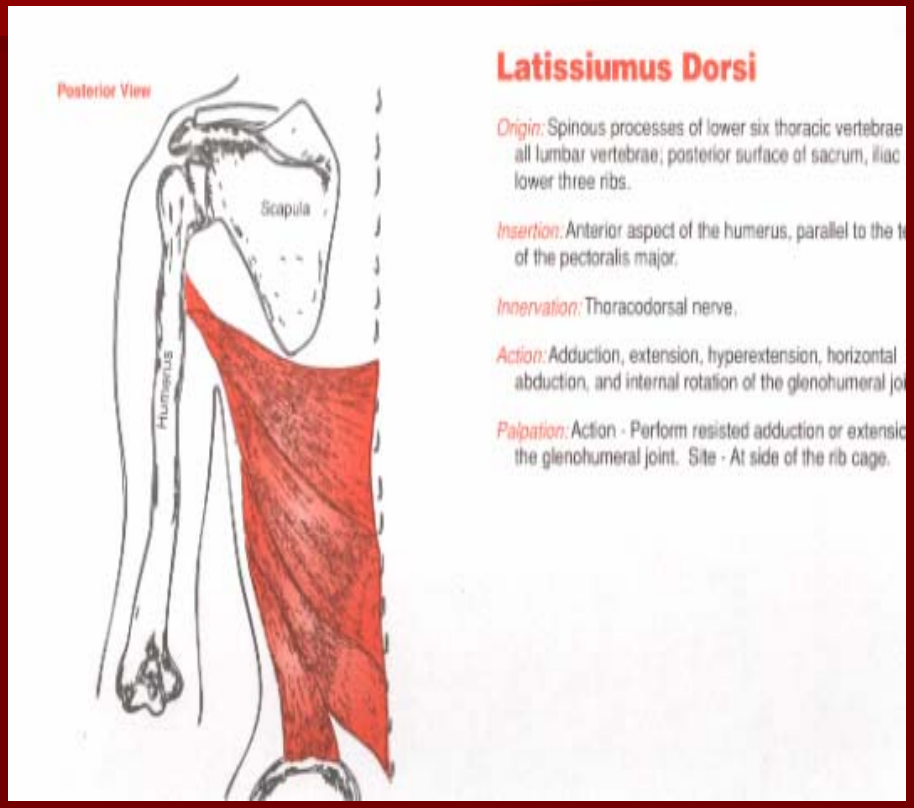
Pectoralis major

- O-clavicle, sternum, costal cartilages of first six ribs
- I-greater tubercle of humerus
- A-flexes the arm

  -adducts and medially rotates the arm

Wingerd 220

Musculature



Latissimus dorsi

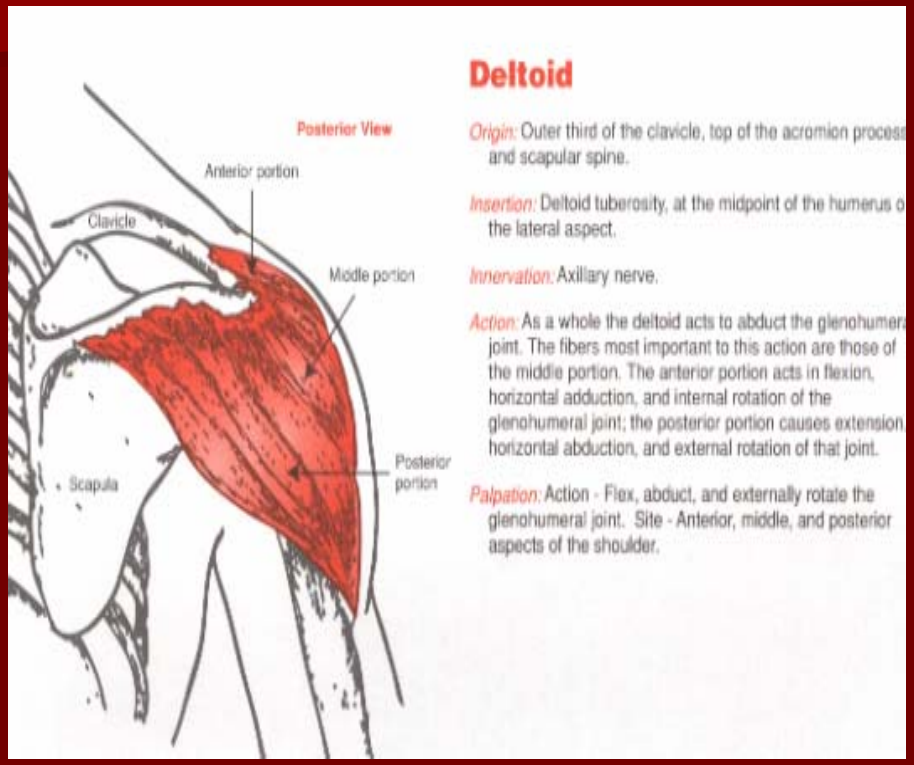
- O-spines of lower six thoracic vertebrae, lumbar vertebrae, lower ribs, and iliac crest
- I-intertubercular groove of humerus
- A-extends the arm

  -adducts and medially rotates the arm

  -pulls the shoulder downward and back

Wingerd 220

Musculature



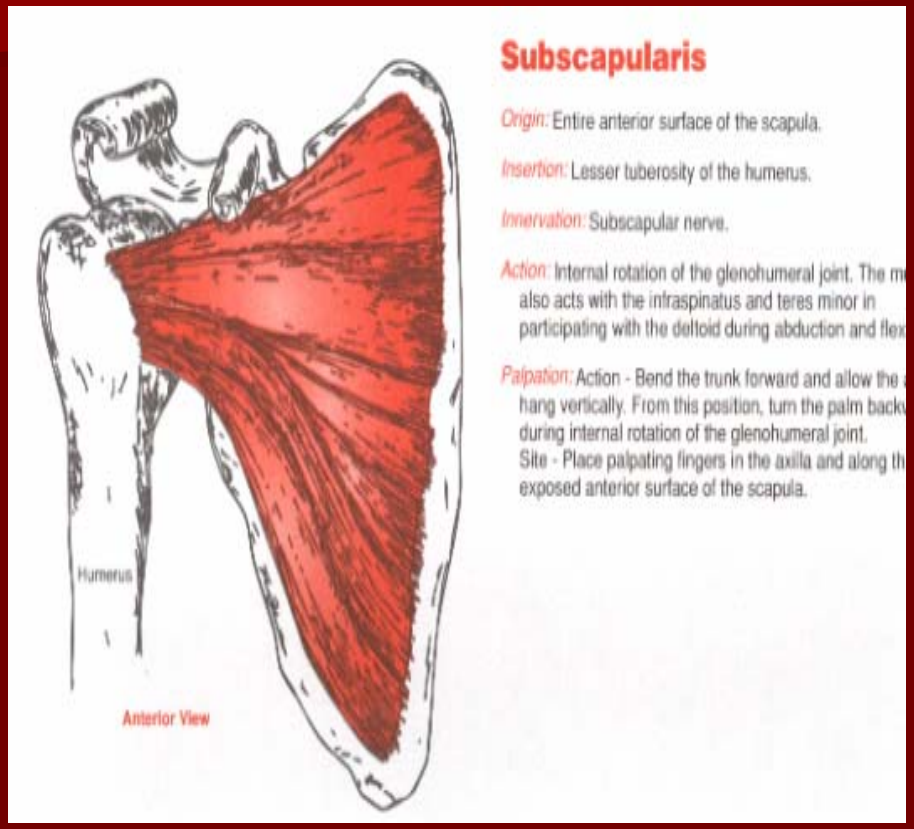
Deltoid

- O-acromion and spine of scapula, and clavicle
- I-deltoid tuberosity of humerus
- A-abducts the arm

  -aids in extending and flexing the humerus

Wingerd 220

Musculature

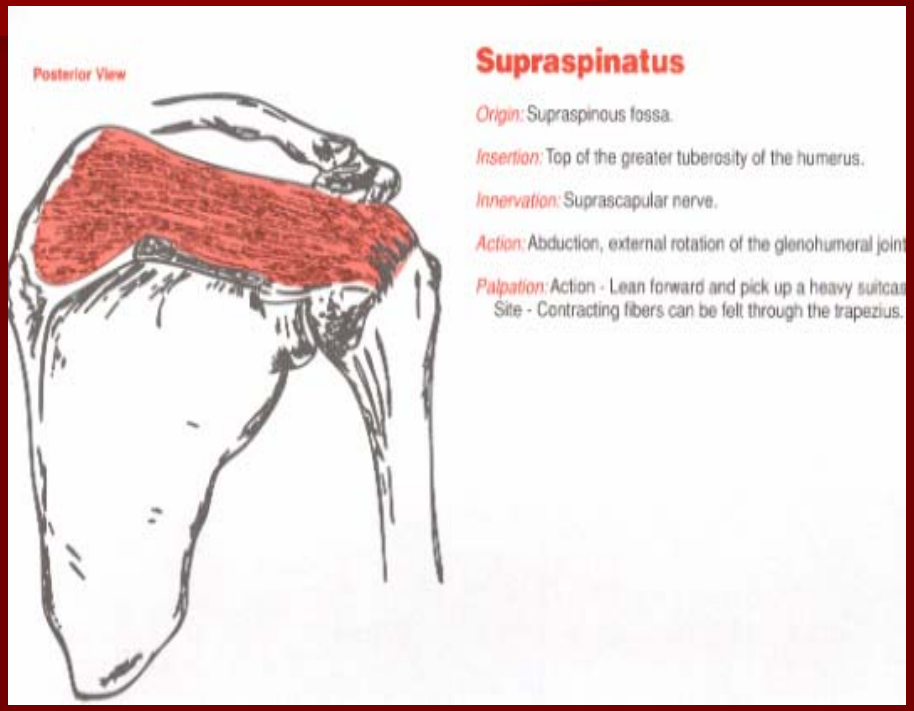


Subscapularis

- O-scapula, anterior surface
- I-lesser tubercle of humerus
- A-rotates the arm medially

Wingerd 220

Musculature

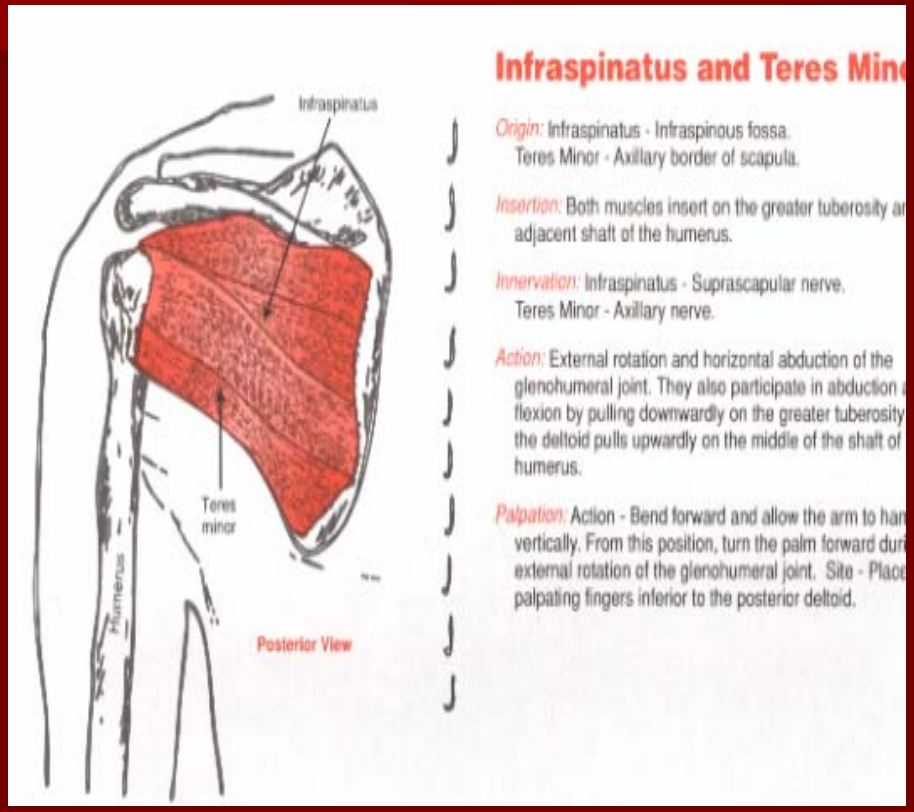


Supraspinatus

- O-scapula, posterior surface
- I-greater tubercle of humerus
- A-abducts the arm

Wingerd 220

Musculature

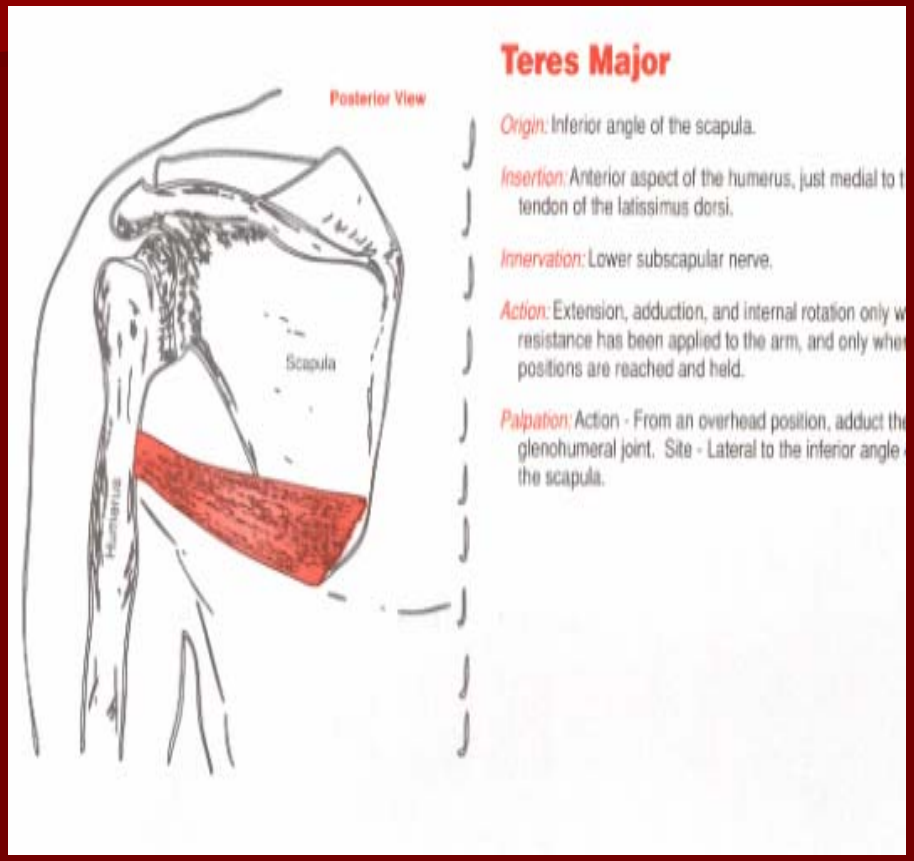


Infraspinatus

- O-scapula, posterior surface below spine
- I-greater tubercle of humerus
- A-rotates the arm laterally

Wingerd 220

Musculature



Teres major

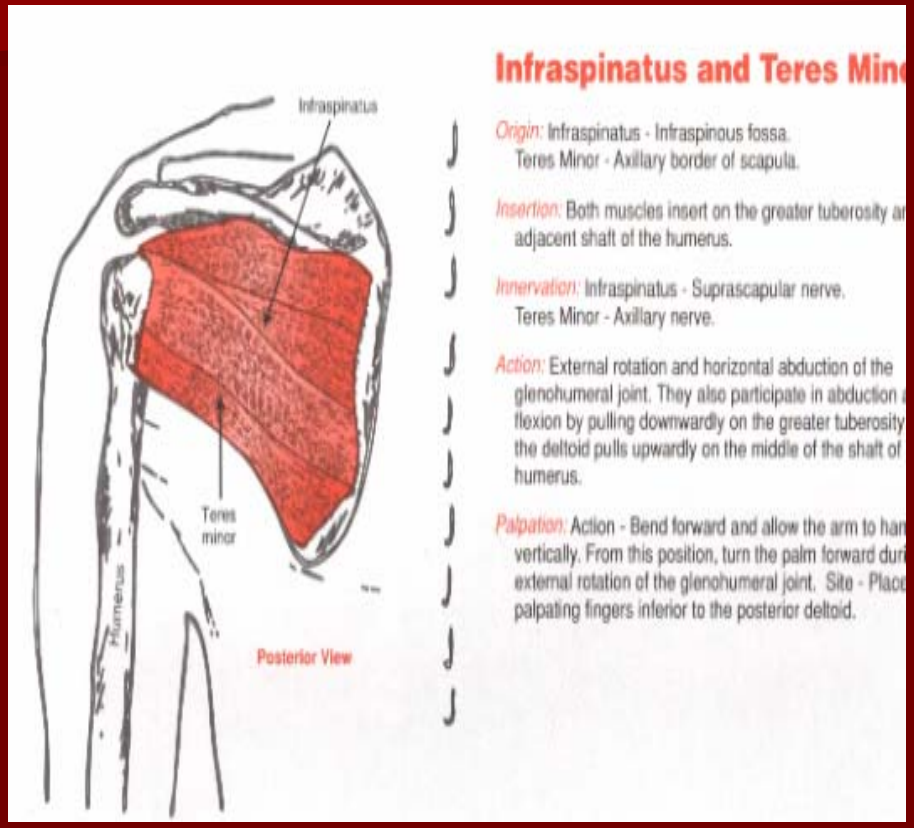
- O-scapula
- I-lesser tubercle of humerus
- A-extends arm

  -adducts arm

  -medially rotates the arm

Wingerd 220

Musculature



Teres minor

- O-scapula
- I-greater tubercle of humerus
- A-rotates the arm laterally with the infraspinatus

Wingerd 220

Healing phases

Inflammatory-response phase

- Last up to 4 days
- Inflammation vital to the healing process
  - S/S of inflammation
    - Redness
    - Swelling
    - Point tender
    - Temperature increase
    - Loss of function
- Clot is formed and the basic ground work of the wound is formed
- Prentice 4,6

Healing phases

Fibroblastic-repair phase

- Ends after 2 days up to 6 weeks
- Formation of crude scar from the granulation tissue
- Area becomes revascularized
- Prentice 6,8

Healing phases

Maturation-remodeling phase

- Ends after 3 weeks to 2-3 years
- Scar forms along lines of stress
  - With proper force and stress, the scar will line up along the area of tensile strength
- Scar never as strong as the original tissue
- Prentice 8

Factors that impede healing

- Extent of injury
- Edema
- Hemorrhage
- Poor vascular supply
- Muscle spasm
- atrophy
- Corticosteroids
- Keloids and hypertrophic scars
- Humidity, climate, and oxygen tension
- Health, age and nutrition
- Prentice 10

Modalities

During inflammatory response

- Cryocuff
- Electrical stimulation
- Intermittent compression
- Ultrasound (non-thermal or pulsed)
- Rest
- Prentice 12

Modalities

Fibroblastic-repair

- Thermotherapy
- Electrical stimulation
- Intermittent compression
- Ultrasound (pulsed)
- Range of motion
- Prentice 12

Modalities

Maturation-remodeling

- Ultrasound (thermal)
- Electrical stimulation
- ROM with strengthening
- Functional activities
- Prentice 12

Range of Motion

- Abduction
  - 180°
- Adduction
  - 45°
- Flexion
  - 180 °
- Extension
  - 45 °
- Internal rotation
  - 55 °
- External rotation
  - 45 °
- For all shoulder movements, the ration of movement of the glenohumeral to the scapulothoracic joints is 2:1
- Hoppenfeld 23-25

Flexibility

- Flexibility is the mobility of a body segment to move within the normal range of motion
- It is dependent on the the soft tissue tolerance to move and the if there is not structural impedance
- Flexibility can be improved with a constant regiment of stretching
  - Examples arm swing to partner stretching
- Can be measured with a goniometer
- Norkin and White

Manual muscle testing

- One of the ways to measure muscular strength
- Scale
  - 5 – normal
  - 4 – good
  - 3 – fair
  - 2 – poor
  - 1 – trace
  - 0 – gone or zero
- Examples
- Daniels and Worthingham 4-5

Other muscle tests

- Cybex test
  - Compare involved side to uninvolved side
- Free weights
  - Can be easily quantitative

Muscular strength and endurance

- Cybex workout
  - Strength and endurance
- UBE
  - Endurance
- Free weights
  - Strength and endurance

Neuromuscular control

- Ability of muscle to perform the tasks it is suppose to do, or the movement you want the muscle to perform
- Is compromised of agility, balance and coordination
- Targeted after flexibility, strength and endurance has been improved back to normal limits

Balance

- Not a big part of the upper extremity
- Is influenced by sensory input from the CNS

PNF stretching

- Is a combination of active and passive stretching
- Hold relax
- Contract relax
- Reversal hold relax

Proprioception

- Is the bodies ability to be aware of it position in space
- Influenced by muscle spindles and golgi tendon organs
  - Detect lengthening and tension in muscle
  - Act as a limb stabilizer

Maintaining cardiorespiratory endurance

- Patient needs to not loose the endurance that they have built up before the injury
- Biking
  - Can keep arm stationary while getting a cardio workout
- EFX
  - Another alternative that may not be as good because the arm would be more at risk to move early in rehab
  - Better later in the rehab process
- Pool running
  - Water limits movement of arm while legs get a workout
  - Adds a variety to workout

Aquatic workout

- Good for early in rehab process if the wounds have healed from the surjury
- Advantageous because the water will decrease pain and spasm
  - Help increase ROM
- Maintain cardiorespiratory endurance

Aquatic workout

- Push/pull with the kickboard
  - Can work flex/ext, int/ext rotation, add/abd
- PNF paterns with snorkel and goggles
- Shoulder press with kickboard
- Shoulder stabilization with barbells

Plyometrics

- Will be late in rehab program
  - Dependent on intensity, volume, frequency, recovery
- Ball toss
  - Chest pass
  - Throw straight up overhead
  - Throw backwards overhead
  - Throw forward overhead
  - Throw over shoulder

Joint mobilization

- Want to make sure that patient is in a loose packed position
- Purpose of joint mobilization
  - Reduce pain
  - Decrease muscle guarding
  - Restore accessory movement
  - decrease joint hypomobility
- Types of movement
  - Spin
  - roll
  - Glide
  - traction

Manual therapy techniques

- Advantageous because you can control the amount of resistance that the patient is working against
- You can modify the program easily
- Disadvantageous because you cannot measure the resistance to evaluate performance and is very time comsuming

Functional Progression

- Start with the easiest activities then progress to the harder activities
- Could start with just moving the lower arm while the upper arm is stabilized still in the sling
- Move towards getting full PROM back, then AROM
- Then move on to increasing strength and endurance
- Once you have those three, you can work on agility, balance and coordination
- After that you can work on sport specific skills

Functional Progression

0-3 weeks

- Immobilizer
- Can take off sling to shower
- Work on squeezing ball 3 days after surgery
- Work on hand and wrist ROM with arm still in sling

Functional Progression

3-4 weeks

- Avoid stress to anterior capsule
- Work on ROM
  - Avoid extension
  - External rotation - 15°
  - Flexion - 45°
  - Abduction - 45°
- Work with surgical tubing or light freeweights
- Continue to do ball squeezes for hand
- Can use arm for writing with paper in their lap
- Shoulder shrugs

Functional Progression

5-6 weeks

- May lose sling if able to stabilize arm
- Avoid stress to anterior capsule
- Work on ROM
  - Extension - 0°
  - External rotation - 30°
  - Internal rotation - 90°
  - Flexion - 90°
  - Abduction - 90°
- Progress up surgical tubing and freeweight ladder
- Use UBE if motion ROM permits
- Biceps curls and triceps extension
- Shoulder elevation and depression

Functional Progression

6-8 weeks

- Lose sling
- ROM - Full
  - Extension - 10°
  - Flexion - 180°
  - External rotation - 30°
  - Internal rotation - 90°
  - Abduction - 180°
  - Horz abduction - 90°
  - Horz adduction - 90°

- Theraband and freeweights progression
- Work high reps low weight still
- Still work shoulder elevation and depression
- UBE at a low resistance

6-8 weeks con't

- PNF patterns
- PNF rhythmic stabilization
- Closed chain exercises
  - Treadmill hand walking, wall push ups
- Isokinetic resistance
  - Set resistance at minimal level like 300 degree/sec
- Start to catch ball
- Still limit the stress on the anterior capsule

Functional Progression

2-4 months

- Should have full ROM
- Work on rotator cuff theraband or freeweight
- Isokinetic resistance at 240 degree/sec
- Full push ups
- PNF pattens and PNF techniques like rhythmic stabilization
- UBE with higher resistance
- Physioball stabilization
- Light plyometric ball toss
- Ball rebounder
- Biceps curls and triceps extension with higher resistance

Functional Progression

4-6 months

- Return to activity if strength is 80 to 85 %

Types of braces

- McDavid shoulder support
  Adjustable shoulder support is ideal for symptomatic relief of sprains, strains, bursitis and tendonitis. Features pockets over the AC joint for an ice pack, a hot or cold pack, or extra padding. When used with a hot or cold pack, it compresses and supports soft tissue while adding therapeutic heat or cold.
- http://www.armsupport.com/shoulder/

Types of braces

- Simply Stable Shoulder Harness
  The SS Shoulder harness provides a light comfortable stabilizing system for non-contact and light contact sports applications. The SS Shoulder harness is designed with a minimum of chest wall restriction and its open design allows for good air circulation and maximum comfort.
- http://www.armsupport.com/shoulder/

Return to Play

- Ultimately up to the physician
- Must have ROM back to normal
- Strength should be equivalent to opposite arm
- Should be able to perform functional activities for position

Bibliography

- Gench, Barbara Kinesiology and Anatomy Study Cards. Eddie Bowers Publishing, inc. 1998
- Hislop, Helen J. Daniels and Worthingham's Muscle testing. W.B. Saunders Company. 1995
- Hoppenfeld, Stanley Physical Examination of the Spine and Extremities Appleton and Lange. 1976
- Houglum, Peggy A. Therapeutic Exercise for Athletic Injuries. Hunan Kinetics. 2001
- Norkin, Cynthia C. Measurement of Joint Motion a Guide to Goniometry. F.A. Davis Company. 1995

Bibliography

- Prentice, William E. Therapeutic Modalities. McGraw-Hill 1999
- Starky, Chad Therapeutic Modalities. F.A. Davis Company 1993
- Watkins, James Structure and Function of the Musculoskeletal System. Human Kinetics 1999
- Wingerd, Bruce D. The Human Body Concepts of Anatomy and Physiology. Saunders College Publishing. 1994
- www.armsupport.com/shoulder/
- www.orthopedics.about.com/library/glossary
- Functional progression from Houglum and JB