I. **Articular Surfaces**
   - Glenoid fossa of scapula
     - Small and oval
       - Mildly concave – contributes to the concavity portion of the concavity-compression mechanism of glenohumeral stability
   - Head of humerus
     - Large rounded surface – much larger area than glenoid
     - Even though surface areas of glenoid and humeral head are quite different their curves are similar (congruent)

II. **Glenoid Labrum**
   - Rim of fibrocartilage that attaches to edge of glenoid
     - Wedge-shaped in cross section
     - May be transitional tissue between joint capsule and articular cartilage
   - Deepens glenoid and increased the surface area of the glenoid
     - Enhances the concavity portion of the concavity-compression mechanism
   - Likely important in “shelf-mechanism” of Basmajian
   - SLAP Lesions
     - Superior Labral Anterior Posterior
     - Tendon of Long Head of Biceps
   - Bankart Lesions
     - Detachment of anterior-inferior aspect of glenoid labrum and associated capsule associated with traumatic anterior dislocation

III. **Joint Capsule**
   - Extends from edge of glenoid and labrum to anatomic neck of humerus except inferiorly where it extends 1-1.5 cm distally (axillary pouch)
   - Medial aspect of capsule (medial to point where tendons of rotator cuff muscles blend with capsule)
     - Capsular tissue only - thin posteriorly and considerably thicker anteriorly
- Lateral aspect of capsule (capsule plus rotator cuff tendons)
  - Rotator cuff tendons blend with capsule laterally so this part of capsule thicker than medially

- Reinforcing ligaments of glenohumeral joint capsule
  - Ligaments not positioned all the way around the joint capsule
    - located anterosuperiorly, anteriorly and inferiorly
  - Coracohumeral ligament
    - root of coracoid to anterosuperior humerus near greater tubercle
    - important in “shelf mechanism”?
  - Superior and Middle Glenohumeral ligaments
    - both attach to anterosuperior glenoid and diverge as they pass laterally
    - superior attaches to anterosuperior humerus above lesser tubercle
    - middle attaches to anteroinferior humerus near lower part of lesser tubercle
  - Inferior Glenohumeral Ligamentous Complex
    - covers inferior aspect of joint
    - hammock-like in construction
      - anterior and posterior bands = ropes of hammock
      - axillary pouch (central part) = sling part of hammock

- Role of capsule and reinforcing ligaments in glenohumeral joint stability
  - These structures help to stabilize the glenohumeral joint when they are elongated and placed on tension

- In anatomic or neutral position (upper limb at side) the capsule is taut superiorly and loose inferiorly
  - This arrangement essential for motion – capsular tissue relatively inelastic so if capsule was taut all around there would be very limited motion

- When humerus is elevated above 90 degrees the complex tightens and the humeral head rotates into the pouch – the IGHLC will then play a major role in providing joint stability
IV. Intrinsic Muscles of the Shoulder

- Intrinsic muscles extend from either the clavicle or scapula to the humerus

- Deltoid muscle
  - Strongest of the intrinsic muscles – consists of anterior, middle and posterior parts – important in elevation of the humerus

- Teres major muscle
  - Extender and medial rotator of the humerus

- Coracobrachialis muscle
  - Weak flexor of the humerus

- Muscles of the rotator cuff (musculocutaneous cuff)
  - Surround joint on three sides – anteriorly, superiorly and posteriorly
    - Subscapularis anteriorly – largest and strongest – medial rotator
    - Supraspinatus superiorly – abductor – subjected to most wear and tear – active whenever elbow is “cleared”
    - Infraspinatus and teres minor posteriorly – external rotators
  - Tendons blend with lateral aspect of joint capsule before attaching to humerus
  - Responsible for compression portion of the concavity-compression mechanism

- Rotator Interval
  - Anterior – superior region of glenohumeral capsule
    - Coracohumeral and superior glenohumeral ligaments
  - Boundaries
    - Superior; anterior aspect of supraspinatus tendon
    - Inferior; superior aspect of subscapularis tendon
    - Lateral; long head of biceps/intertubercular groove
    - Medial; base of coracoid process

V. Tendon of the Long Head of the Biceps Brachii Muscle

- Enters intertubercular groove of humerus then crosses anterosuperior aspect of humeral head to attach to supraglenoid tubercle

- During humeral motion this tendon is stationary as humeral head spins and rotates

- Appears to play role in “holding humeral head down” (preventing superior translation)
VI. **Stability of the Glenohumeral Joint**

- Stability not consistent – different in static and dynamic situations

- Static stability – upper limb in neutral position
  - “Shelf mechanism” of Basmajian and Basant
    - In the neutral position the integrity of the joint can be maintained with virtually no muscle activity
    - Likely explanation is that the inferior aspect of the humeral head is resting on the inferior glenoid labrum (the shelf) and it is held there by the superior aspect of the capsule which is taut in that position
    - If weight is added to the limb in this position the supraspinatus becomes active presumably reinforcing the superior aspect of the capsule

- Dynamic stability – occurs with any motion
  - Concavity-compression mechanism (Lippitt, 1993)
    - Muscles of the rotator cuff – provide compression portion of concavity-compression mechanism
    - Glenoid fossa and labrum – provide concavity portion of concavity-compression mechanism
  - Role of scapulothoracic muscles in dynamic glenohumeral stability
    - Play an important role in positioning the glenoid fossa so as to maintain optimal alignment between the humeral head and glenoid fossa (concavity portion of concavity-compression mechanism)

VII. **Suprachumeral (subacromial) Space**

- Not part of the glenohumeral joint and not a joint in any sense but an important anatomic area of the shoulder that is involved in virtually any motion and the location of a number of common shoulder problems

- Boundaries of space
  - Roof or superior boundary;
    - Acromion, coracoid process, intervening coracoacromial ligament and the acromioclavicular joint
  - Floor
    - Head of humerus

- Contents of space (from superior to inferior)
  - Subacromial (subdeltoid) bursa
  - Supraspinatus muscle/tendon
  - Superior aspect of joint capsule
  - Tendon of the long head of the biceps brachii muscle (limited to the anterior aspect of the space)
• Impingement Syndrome
  o Intrinsic versus Extrinsic
    ▪ Intrinsic
      – tendonitis versus tendionosis
    ▪ Extrinsic
      – compression from acromion, CA ligament, AC joint
      – compression between greater tubercle and posterior superior glenoid

• Rotator Cuff Tears