Shoulder Region and Back

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Lecture Outline

- Shoulder Region
  - Shoulder Joint
  - Acromioclavicular Joint
  - Muscles

- Back
  - Joint
  - Muscles
    - Superficial
    - Deep
  - Scapular anastomosis
  - Spaces
Shoulder Joint

- Classification
- Bones & articular surfaces
- Articular capsule
- Ligaments
  - Intra- & Extra- capsular
- Bursae
- Blood supply & Nerve supply
- Movements & Muscles Involved
- Stability
- Applied Anatomy
Glenohumeral (Shoulder) Joint

Classification:
- Glenohumeral joint.

- **Type**: multiaxial spheroidal synovial Joint
- **Variety**: Ball & Socket.

Articulating Surfaces
- Head of humerus (H)
- Glenoid fossa (X) of scapula (S)
  - Glenoid labrum ↑ concavity
Articular capsule (AC)

- Thin fibrous membrane attached to margin of glenoid fossa & around anatomical neck of humerus
  - Deficient inferiorly

- Synovial membrane lines capsule & covers part of anatomical neck
  - Supported by SITS tendons
Ligaments

- **Glenohumeral**
  - 3 bands (superior, middle & inferior glenohumeral ligaments),
  - visible from within joint

- **Transverse humeral (TH)**

- **Coracoacromial (CA)**
  - strong accessory ligament.
  - medial border of acromion to lateral border of coracoid
Ligaments....

Coracohumeral (CH)

- Strong
- From inferior surface of coracoid process to margin of greater tubercle of humerus
- Blends with capsule
**Bursae**

- Several (8) Located where tendons rubs against a bone, ligament or tendon
  - Subacromial (subdeltoid)
    - Large & under coracoacromial ligament & deltoid muscle
  - Tendon of Subscapularis & capsule
Interior of Shoulder Joint
Blood Supply

- Anterior & posterior circumflex humeral
- Suprascapular
- Subscapular (circumflex scapular branch)
Nerve Supply

- **Articular branches**
  (axillary, suprascapular, lateral pectoral nerves)

- **Hilton’s Law** - The motor nerve to a muscle tends to give a branch of supply to the joint which the muscle moves and another to the skin over the joint.
## Movements & Muscles Involved

<table>
<thead>
<tr>
<th>Movement</th>
<th>Muscles Involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abduction</td>
<td>Deltoid, Supraspinatus</td>
</tr>
<tr>
<td>Adduction</td>
<td>Pectoralis major, Latissimus dorsi, Subscapularis, Infraspinatus, Teres minor</td>
</tr>
<tr>
<td>Flexion</td>
<td>Pectoralis major, Deltoid, Coracobrachialis</td>
</tr>
<tr>
<td>Extension</td>
<td>Deltoid, Teres major, Latissimus dorsi, Pectoralis major</td>
</tr>
<tr>
<td>Medial Rotation</td>
<td>Subscapularis, Pectoralis major, Deltoid, Latissimus dorsi</td>
</tr>
<tr>
<td>Lateral Rotation</td>
<td>Infraspinatus, Deltoid, Teres minor</td>
</tr>
<tr>
<td>Circumduction</td>
<td><em>Combination of all movements above</em></td>
</tr>
</tbody>
</table>
Factors for Stability

- Glenoid labrum - increased concavity
- Coracoacromial arch
  - coracoid process, coracoacromial ligament & acromion which prevent upward dislocation
- Tendon of long head of biceps
  - additional superior support.
- Long head of triceps
  - inferior support during abduction
Stability…

- Rotator cuff (SITS) muscles
  - Supraspinatus
  - Infraspinatus
  - Teres minor
  - Subscapularis
    - Provide strong lateral stability
    - Stabilizes head of humerus in glenoid cavity & prevent dislocation

- Ligaments
Applied Anatomy Shoulder Joint

- Most frequently dislocated joint

- Dislocation (especially in violent abduction) occurs towards inferior aspect which is devoid of muscles

- Axillary nerve
  - prone to tear in injury at surgical neck of humerus
  - close relation to inferior aspect of articular capsule
The Back of Pectoral girdle

- **Bones – Vertebral Column**
- **Joints**
  - Intervertebral Joints at the body of vertebra
  - Vertebral arch
  - Superior and Inferior facets
- **Muscles**
  - Superficial & Deep groups
Bony component of the Back
Superficial and Deep Muscles of the Back

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Superficial Muscles of Back

- Trapezius
- Deltoid
- Latissimus dorsi

- Triangle of auscultation
- Latissimus dorsi, trapezius & scapula
  - Post segments of lungs
Deep muscles of Back –
Medial group of pectoral muscles

- Levator scapulae
  - Dorsal scapular & cervical nerves

- Rhomboid minor

- Rhomboid major
  - Dorsal scapular nerve
Deep muscles of Back –
Lateral group of pectoral muscles

- Supraspinatus
- Infraspinatus
- Teres major
- Teres minor
- Subscapularis

See Table for origin, insertion, nerve supply and action of muscles in Recommended textbook
Anastomosis around the scapula

- Transverse cervical artery (Thyroccervical trunk of subclavian artery).
  - Gives off the dorsal scapular artery
- Suprascapular artery (thyroccervical artery)
- Subscapular artery (Axillary artery) divides into
  - circumflex scapular and thoracodorsal
Quadrangular Space

- **Boundaries**
  - Superior: T. minor
  - Inferior: T. major
  - Lateral: Surgical neck of humerus
  - Medial: Long head triceps

- **Contents**
  - Axillary nerve
  - Posterior circumflex humeral artery
Triangular Space - Upper

- **Boundaries**
  - Lateral: Long head of triceps
  - Superior: T. minor
  - Inferior: T. major

- **Contents**
  - Circumflex scapular artery
Triangular Space - Lower

**Boundaries**
- Above - subscapularis anteriorly and teres major posteriorly
- Medially - long head of triceps
- Laterally - the humerus laterally

**Contents**
- Radial nerve
- Profunda brachii vessels
Questions!!!

- With the aid of a table, list the movements at the shoulder joint and the muscles producing each movement.
- List the factors that stabilize the shoulder joint.
- Using a diagram, show the arteries involved in scapular anastomosis.
- What are the boundaries and contents of the quadrangular and triangular spaces.