Muscles of the Shoulder
Lecture Objectives

• List the muscles that are attached to the scapula
• Describe the attachments and the action of the above mentioned muscles and their nerve supply
• Discuss the inter-muscular spaces related to the scapula and their contents
• List the rotator cuff muscles
Anterior Axioappendicular muscles

- Pectoralis major
  - Clavipectoral (deltoplectoral) triangle
  - Deltoplectoral groove
  - Anterior wall of the axilla
  - Anterior axillary fold
- Pectoralis minor
  - Anterior wall of the axilla
- Subclavius
- Serratus anterior
  - Medial wall of the axilla
<table>
<thead>
<tr>
<th>Muscle</th>
<th>Proximal Attachment</th>
<th>Distal Attachment</th>
<th>Innervation&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Main Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pectoralis major</strong></td>
<td>Clavicular head: anterior surface of medial half of clavicle</td>
<td>Lateral lip of intertubercular sulcus of humerus</td>
<td>Lateral and medial pectoral nerves; clavicular head (C5, C6), sternocostal head (C7, C8, T1)</td>
<td>Adducts and medially rotates humerus; draws scapula anteriorly and inferiorly</td>
</tr>
<tr>
<td></td>
<td>Sternocostal head: anterior surface of sternum, superior six costal cartilages, aponeurosis of external oblique muscle</td>
<td></td>
<td></td>
<td>Acting alone, clavicular head flexes humerus and sternocostal head extends it from the flexed position</td>
</tr>
<tr>
<td><strong>Pectoralis minor</strong></td>
<td>3rd–5th ribs near their costal cartilages</td>
<td>Medial border and superior surface of coracoid process of scapula</td>
<td>Medial pectoral nerve (C8, T1)</td>
<td>Stabilizes scapula by drawing it inferiorly and anteriorly against thoracic wall</td>
</tr>
<tr>
<td><strong>Subclavius</strong></td>
<td>Junction of 1st rib and its costal cartilage</td>
<td>Inferior surface of middle third of clavicle</td>
<td>Nerve to subclavius (C5, C6)</td>
<td>Anchors and depresses clavicle</td>
</tr>
<tr>
<td><strong>Serratus anterior</strong></td>
<td>External surfaces of lateral parts of 1st–8th ribs</td>
<td>Anterior surface of medial border of scapula</td>
<td>Long thoracic nerve (C5, C6, C7)</td>
<td>Protracts scapula and holds it against thoracic wall; rotates scapula</td>
</tr>
</tbody>
</table>

<sup>a</sup>The spinal cord segmental innervation is indicated (e.g., “C5, C6” means that the nerves supplying the subclavius are derived from the fifth and sixth cervical segments of the spinal cord). Numbers in boldface (C5) indicate the main segmental innervation. Damage to one or more of the listed spinal cord segments or to the motor nerve roots arising from them results in paralysis of the muscles concerned.
# Anterior Axioappendicular muscles

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Origin</th>
<th>Insertion</th>
<th>Nerve Supply</th>
<th>Nerve Roots*</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pectoralis major</td>
<td>Clavicle, sternum and upper six costal cartilages</td>
<td>Lateral lip of bicipital groove of humerus</td>
<td>Medial and lateral pectoral nerves from brachial plexus</td>
<td>C5, 6, 7, 8; T1</td>
<td>Adducts arm and rotates it medially; clavicular fibers also flex arm</td>
</tr>
<tr>
<td>Pectoralis minor</td>
<td>Third, fourth, and fifth ribs</td>
<td>Coracoid process of scapula</td>
<td>Medial pectoral nerve from brachial plexus</td>
<td>C6, 7, 8</td>
<td>Depresses point of shoulder; if the scapula is fixed, it elevates the ribs of origin</td>
</tr>
<tr>
<td>Subclavius</td>
<td>First costal cartilage</td>
<td>Clavicle</td>
<td>Nerve to subclavius from upper trunk of brachial plexus</td>
<td>C5, 6</td>
<td>Depresses the clavicle and steadies this bone during movements of the shoulder girdle</td>
</tr>
<tr>
<td>Serratus anterior</td>
<td>Upper eight ribs</td>
<td>Medial border and inferior angle of scapula</td>
<td>Long thoracic nerve</td>
<td>C5, 6, 7</td>
<td>Draws the scapula forward around the thoracic wall; rotates scapula</td>
</tr>
</tbody>
</table>

*The predominant nerve root supply is indicated by boldface type.
Anterior Axioappendicular Muscles: Relations
Posterior Axioappendicular Muscles

• Superficial muscles:
  • Trapezius m.
  • Latissimus dorsi m.

• Deep muscles:
  • Levator scapulae m.
  • Rhomboid minor m.
  • Rhomboid major m.
Trapezius muscle

- Three parts:
  - Superior fibers
  - Middle fibers
  - Inferior fibers
Latissimus dorsi muscle

- Posterior axillary fold
- Relation with teres major m.
Deep axioappendicular muscles

- Levator scapulae
  - Superior part....deep to sternocleidomastoid m.
  - Inferior part ......deep to trapezius m.
- Romboids
  - Deep to the trapezius m.
  - Romboid minor is thicker
  - Romboid major is wider
<table>
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<tr>
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<th>Nerve Supply</th>
<th>Nerve Roots</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trapezius</td>
<td>Occipital bone, ligamentum nuchae, spine of seventh cervical vertebrae, spines of all thoracic vertebrae</td>
<td>Upper fibers into lateral third of clavicle; middle and lower fibers into acromion and spine of scapula</td>
<td>Spinal part of accessory nerve (motor) and C3 and 4 (sensory)</td>
<td>XI cranial nerve (spinal part)</td>
<td>Upper fibers elevate the scapula; middle fibers pull scapula medially; lower fibers pull medial border of scapula downward</td>
</tr>
<tr>
<td>Latissimus dorsi</td>
<td>Iliac crest, lumbar fascia, spines of lower six thoracic vertebrae, lower three or four ribs, and inferior angle of scapula</td>
<td>Floor of bicipital groove of humerus</td>
<td>Thoracodorsal nerve</td>
<td>C6, 7, 8,</td>
<td>Extends, adducts, and medially rotates the arm</td>
</tr>
<tr>
<td>Levator scapulae</td>
<td>Transverse processes of first four cervical vertebrae</td>
<td>Medial border of scapula</td>
<td>C3 and 4 and dorsal scapular nerve</td>
<td>C3, 4, 5</td>
<td>Raises medial border of scapula</td>
</tr>
<tr>
<td>Rhomboid minor</td>
<td>Ligamentum nuchae and spines of seventh cervical and first thoracic vertebrae</td>
<td>Medial border of scapula</td>
<td>Dorsal scapular nerve</td>
<td>C4, 5</td>
<td>Raises medial border of scapula upward and medially</td>
</tr>
<tr>
<td>Rhomboid major</td>
<td>Second to fifth thoracic spines</td>
<td>Medial border of scapula</td>
<td>Dorsal scapular nerve</td>
<td>C4, 5</td>
<td>Raises medial border of scapula upward and medially</td>
</tr>
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*The predominant nerve root supply is indicated by boldface type.

Scapulohumeral muscles

- Deltoid muscle
  - Covers the shoulder
  - Superficial muscle
  - Three parts:
    - Anterior fibers
    - Middle fibers
    - Posterior fibers
Scapulohumeral muscles

- Teres major muscle
  - Posterior wall of the axilla
  - Relations with latissimus dorsi m.
Rotator Cuff Muscles

- Attach humerus to scapula
- Encircle the joint supporting the capsule
- Hold head of humerus in socket
Scapulohumeral Muscles: Rotator Cuff Muscles

- Supscapularis m.
- Supraspinatus m.
  - Initial abduction of the arm
- Infraspinatus m.
- Teres minor m.
(A) Lateral oblique view (perpendicular to plane of scapula)

(B) Right anterolateral view
<table>
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<tr>
<th>Muscle</th>
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</thead>
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<tr>
<td>Deltoid</td>
<td>Lateral third of clavicle, acromion, spine of scapula</td>
<td>Middle of lateral surface of shaft of humerus</td>
<td>Axillary nerve</td>
<td>C5, 6</td>
<td>Abducts arm; anterior fibers flex and medially rotate arm; posterior fibers extend and laterally rotate arm</td>
</tr>
<tr>
<td>Supraspinatus</td>
<td>Supraspinous fossa of scapula</td>
<td>Greater tuberosity of humerus; capsule of shoulder joint</td>
<td>Suprascapular nerve</td>
<td>C4, 5, 6</td>
<td>Abducts arm and stabilizes shoulder joint</td>
</tr>
<tr>
<td>Infraspinatus</td>
<td>Infraspinous fossa of scapula</td>
<td>Greater tuberosity of humerus; capsule of shoulder joint</td>
<td>Suprascapular nerve</td>
<td>(C4), 5, 6</td>
<td>Lateral rotator arm and stabilizes shoulder joint</td>
</tr>
<tr>
<td>Teres major</td>
<td>Lower third of lateral border of scapula</td>
<td>Medial lip of bicipital groove of humerus</td>
<td>Lower subscapular nerve</td>
<td>C6, 7</td>
<td>Medially rotates and adducts arm and stabilizes shoulder joint</td>
</tr>
<tr>
<td>Teres minor</td>
<td>Upper two thirds of lateral border of scapula</td>
<td>Greater tuberosity of humerus; capsule of shoulder joint</td>
<td>Axillary nerve</td>
<td>(C4), C5, 6</td>
<td>Laterally rotates arm and stabilizes shoulder joint</td>
</tr>
<tr>
<td>Subscapularis</td>
<td>Subscapular fossa</td>
<td>Lesser tuberosity of humerus</td>
<td>Upper and lower subscapular nerves</td>
<td>C5, 6, 7</td>
<td>Medially rotates arm and stabilizes shoulder joint</td>
</tr>
</tbody>
</table>

*The predominant nerve root supply is indicated by boldface type.

Quadrangular space

• Boundaries:
  • Superiorly...subscapularis m.
  • Inferiorly... teres major m.
  • Laterally.... Surgical neck of humerus
  • Medially... long head of triceps

• Contents
Clavipectoral (Deltoplectoral) Triangle

- Boundaries
- Contents