Anatomy and Kinesiology of the Shoulder Girdle
Lesson Plan:
40a  Anatomy and Kinesiology of the Shoulder Girdle

• 5 minutes:  Breath of Arrival and Attendance
• 20 minutes: New Muscles: rotator cuff muscles, pectoralis minor, and serratus anterior
• 15 minutes: Scapulothoracic Agonists
• 15 minutes: Glenohumeral Agonists
Classroom Rules

Punctuality- everybody's time is precious:

• Be ready to learn by the start of class, we'll have you out of here on time
• Tardiness: arriving late, late return after breaks, leaving early

The following are not allowed:

• Bare feet
• Side talking
• Lying down
• Inappropriate clothing
• Food or drink except water
• Phones in classrooms, clinic or bathrooms

You will receive one verbal warning, then you'll have to leave the room.
# New Muscles

## Rotator Cuff

<table>
<thead>
<tr>
<th>Code</th>
<th>Muscle</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Supraspinatus</td>
</tr>
<tr>
<td>I</td>
<td>Infraspinatus</td>
</tr>
<tr>
<td>T</td>
<td>Teres Minor</td>
</tr>
<tr>
<td>S</td>
<td>Subscapularis</td>
</tr>
</tbody>
</table>

Know these OIA’s

## Other Scapular Muscles

<table>
<thead>
<tr>
<th>Muscle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pectoralis Minor</td>
</tr>
<tr>
<td>Serratus Anterior</td>
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</tbody>
</table>

Don’t need to know these OIA’s yet
Supraspinatus

Origin:
  • Supraspinous fossa of the scapula

Insertion:
  • Greater tubercle of the humerus (superior facet)

Actions:
  • Shoulder AB duction
Supraspinatus

Origin:
- Supraspinous fossa of the scapula

Insertion:
- Greater tubercle of the humerus (superior facet)

Actions:
- Shoulder AB duction
Infraspinatus

Origin:
  • Infraspinous fossa of the scapula

Insertion:
  • Greater tubercle of the humerus (middle facet)

Actions:
  • Shoulder lateral rotation
Infraspinatus

Origin:
• Infraspinous fossa of the scapula

Insertion:
• Greater tubercle of the humerus (middle facet)

Actions:
• Shoulder lateral rotation
Teres Minor

Origin:
  • Upper axillary border of the scapula

Insertion:
  • Greater tubercle of the humerus (inferior facet)

Actions:
  • Shoulder lateral rotation
Teres Minor

Origin:
- Upper axillary border of the scapula

Insertion:
- Greater tubercle of the humerus (inferior facet)

Actions:
- Shoulder lateral rotation
Subscapularis

Origin:
- Subscapular fossa of the scapula

Insertion:
- Lesser tubercle of the humerus

Actions:
- Shoulder medial rotation
Subscapularis

Origin:
• Subscapular fossa of the scapula

Insertion:
• Lesser tubercle of the humerus

Actions:
• Shoulder medial rotation
Rotator Cuff

Posterior View

Supraspinatus
Infraspinatus
Teres Minor
(Teres Major)

(Latissimus Dorsi)

Anterior View

Subscapularis
Two other new muscles

Pectoralis Major

Serratus Anterior
Serratus Anterior

Origin:
- Ribs 1-9, outer surfaces

Insertion:
- Vertebral border of the scapula

Actions:
- Scapular depression
- Scapular abduction/protration
- Scapular upward rotation
- Holds the scapula to the thorax
Serratus Anterior

Origin:
- Ribs 1-9, outer surfaces

Insertion:
- Vertebral border of the scapula

Actions:
- Scapular depression
- Scapular abduction/protraction
- Scapular upward rotation
- Holds the scapula to the thorax
Serratus Anterior

Origin:
• Ribs 1-9, outer surfaces

Insertion:
• Vertebral border of the scapula

Actions:
• Scapular depression
• Scapular abduction/protracation
• Scapular upward rotation
• Holds the scapula to the thorax
Pectoralis Minor

Origin:
- Ribs 3-5

Insertion:
- Coracoid process of the scapula

Actions:
- Scapular depression
- Scapular abduction/protraction
- Scapular downward rotation
Pectoralis Minor

Origin:
• Ribs 3-5

Insertion:
• Coracoid process of the scapula

Actions:
• Scapular depression
• Scapular abduction/protracation
• Scapular downward rotation
Scapulothoracic Joint Muscles

Trapezius
Levator Scapula
Rhomboids
Serratus Anterior
Pectoralis Minor
Scapulothoracic Joint Muscles

Posterior View

- Trapezius
- Levator Scapula
- Rhomboids
- Serratus Anterior
Scapulothoracic Joint Muscles

- Levator Scapula
- Trapezius
- Pectoralis Minor
- Serratus Anterior

Anterior View
Agonists of the Scapulothoracic Joint
# Agonists of the Scapulothoracic Joint

## Depression
1. Lower Trapezius
2. Serratus Anterior
3. Pectoralis Minor

## Elevation
1. Upper Trapezius
2. Levator Scapula
3. Rhomboids
Agonists of the Scapulothoracic Joint

Depression
1. Lower Trapezius
2. Serratus Anterior
3. Pectoralis Minor

Elevation
1. Upper Trapezius
2. Levator Scapula
3. Rhomboids
Agonists of the Scapulothoracic Joint

Retraction/Adduction
1. Middle Trapezius
2. Rhomboids

Protraction/Abduction
1. Serratus Anterior
2. Pectoralis Minor
Agonists of the Scapulothoracic Joint

Retraction/Adduction
1. Middle Trapezius
2. Rhomboids

Protraction/Abduction
1. Serratus Anterior
2. Pectoralis Minor
Agonists of the Scapulothoracic Joint

Upward Rotation
1. Upper and Lower Trapezius
2. Serratus Anterior

Downward Rotation
1. Rhomboids
2. Levator Scapula
3. Pectoralis Minor
Agonists of the Scapulothoracic Joint

Upward Rotation
1. Upper and Lower Trapezius
2. Serratus Anterior

Downward Rotation
1. Rhomboids
2. Levator Scapula
3. Pectoralis Minor
Glenohumeral Joint Muscles

- Deltoid
- Pectoralis Major
- Latissimus Dorsi
- Teres Major
- Triceps
- Supraspinatus
- Subscapularis
- Infraspinatus
- Teres Minor
Glenohumeral Joint Muscles

Deltoid
Pectoralis Major
Triceps Brachii
Biceps Brachii

Anterior View
Agonists of the Glenohumeral Joint

**Flexion**
1. Anterior Deltoid
2. Pectoralis Major (clavicular head)

**Extension**
1. Posterior Deltoid
2. Latissimus Dorsi / Teres Major
3. Pectoralis Major (sternal head)
4. Triceps Brachii (long head)
Agonists of the Glenohumeral Joint

**Flexion**
1. Anterior Deltoid
2. Pectoralis Major (clavicular head)

**Extension**
1. Posterior Deltoid
2. Latissimus Dorsi / Teres Major
3. Pectoralis Major (sternal head)
4. Triceps Brachii (long head)
Agonists of the Glenohumeral Joint

**Abduction**
1. Deltoid (all fibers)
2. Supraspinatus

**Adduction**
1. Pectoralis Major
2. Latissimus Dorsi / Teres Major
3. Triceps Brachii (long head)
Agonists of the Glenohumeral Joint

Abduction
1. Deltoid (all fibers)
2. Supraspinatus

Adduction
1. Pectoralis Major
2. Latissimus Dorsi / Teres Major
3. Triceps Brachii (long head)
Agonists of the Glenohumeral Joint

**Medial Rotation**
1. Anterior Deltoid
2. Subscapularis
3. Pectoralis Major

**Lateral Rotation**
1. Posterior Deltoid
2. Infraspinatus / Teres Minor
Agonists of the Glenohumeral Joint

**Medial Rotation**
1. Anterior Deltoid
2. Subscapularis
3. Pectoralis Major

**Lateral Rotation**
1. Posterior Deltoid
2. Infraspinatus / Teres Minor
Anatomy and Kinesiology of the Shoulder Girdle
Use the following slides if needed to review muscles
Trapezius in context
Trapezius in context
**Trapezius**

**Origin:**
- Occiput
- Ligamentum nuchae (nuchal ligament)
- Spinous processes of C7-T12

**Insertion:**
- Lateral one-third of clavicle
- Acromion process
- Spine of the scapula

**Actions:**
- **Upper:**
  - Elevate the scapula
  - Upwardly rotate the scapula
  - Laterally flex head and neck
  - Rotate head and neck to opposite side
  - Extend head and neck
- **Middle:**
  - Adduct the scapula
- **Lower:**
  - Depress the scapula
  - Upwardly rotate the scapula
**Trapezius**

**Origin:**
- Occiput
- Ligamentum nuchae
- Spinous processes of C7-T12

**Insertion:**
- Lateral one-third of clavicle
- Acromion process
- Spine of the scapula

**Actions:**
- **Upper:**
  - Elevate the scapula
  - Upwardly rotate the scapula
  - Laterally flex head and neck
  - Rotate head and neck to opposite side
  - Extend head and neck
- **Middle:**
  - Adduct the scapula
- **Lower:**
  - Depress the scapula
  - Upwardly rotate the scapula
Trapezius

Origin:
- Occiput
- Ligamentum nuchae
- Spinous processes of C7-T12

Insertion:
- Lateral one-third of clavicle
- Acromion process
- Spine of the scapula

Actions:
- Upper:
  - Elevate the scapula
  - Upwardly rotate the scapula
  - Laterally flex head and neck
  - Rotate head and neck to opposite side
  - Extend head and neck
- Middle:
  - Adduct the scapula (retraction)
- Lower:
  - Depress the scapula
  - Upwardly rotate the scapula
Rhomboids in context
Rhomboids

Origin:
- Major:
  - Spinous processes of T2-T5
- Minor:
  - Spinous processes of C7-T1

Insertion:
- Major:
  - Medial border of scapula, between the spine and inferior angle
- Minor:
  - Upper portion of medial border of scapula, across from the spine

Actions:
- Adduct the scapula
- Downwardly rotate the scapula
Rhomboids

Origin:
- Major:
  - Spinous processes of T2-T5
- Minor:
  - Spinous processes of C7-T1

Insertion:
- Major:
  - Medial border of scapula, between the spine and inferior angle
- Minor:
  - Upper portion of medial border of scapula, across from the spine

Actions:
- Adduct the scapula (retraction)
- Downwardly rotate the scapula
Levator Scapula in context
**Levator Scapula**

**Origin:**
- Transverse processes of C1-4

**Insertion:**
- Upper region of medial border of scapula
- Superior angle of scapula

**Actions:**
- Elevate the scapula
- Downward rotation of the scapula
**Levator Scapula**

**Origin:**
- Transverse processes of C1-4

**Insertion:**
- Upper region of medial border of scapula
- Superior angle of scapula

**Actions:**
- Elevate the scapula
- Downward rotation of the scapula
Teres major and Latissimus dorsi
Teres major and Latissimus dorsi
Latissimus dorsi

Origin:
- Spinous processes of last 6 thoracic vertebrae
- Last 3-4 ribs
- Thoracolumbar aponeurosis
- Iliac crest

Insertion:
- Crest of the lesser tubercle of the humerus

Actions:
- Shoulder extension
- Shoulder medial rotation
- Shoulder adduction
Latissimus dorsi

Origin:
- Spinous processes of last 6 thoracic vertebrae
- Last 3-4 ribs
- Thoracolumbar aponeurosis
- Iliac crest

Insertion:
- Crest of the lesser tubercle of the humerus

Actions:
- Shoulder extension
- Shoulder medial rotation
- Shoulder adduction
Latissimus dorsi

Origin:
- Spinous processes of last 6 thoracic vertebrae
- Last 3-4 ribs
- Thoracolumbar aponeurosis
- Iliac crest

Insertion:
- Crest of the lesser tubercle of the humerus

Actions:
- Shoulder extension
- Shoulder medial rotation
- Shoulder adduction
Teres Major

Origin:
• Lower axillary border and inferior angle of scapula

Insertion:
• Medial lip of bicipital groove of humerus

Action:
• Extension of humerus
• Adduction of humerus
• Medial rotation of humerus
Teres Major

Origin:
• Lower axillary border and inferior angle of scapula

Insertion:
• Medial lip of bicipital groove of humerus

Action:
• Extension of humerus
• Adduction of humerus
• Medial rotation of humerus
Teres Major

Origin:
- Lower axillary border and inferior angle of scapula

Insertion:
- Medial lip of bicipital groove of humerus

Action:
- Extension of humerus
- Adduction of humerus
- Medial rotation of humerus
Deltoid and Pectoralis Major
Deltoid and Pectoralis Major
Deltoid

Origin:
- Anterior: lateral third of clavicle
- Middle: acromion process of scapula
- Posterior: spine of scapula

Insertion:
- Deltoid tuberosity of humerus

Actions:
- All fibers: Shoulder abduction
- Anterior:
  - Shoulder horizontal adduction
  - Shoulder flexion
  - Shoulder medial rotation
- Posterior:
  - Shoulder horizontal abduction
  - Shoulder extension
  - Shoulder lateral rotation
Deltoid

Origin:
- Anterior: lateral third of clavicle
- Middle: acromion process of scapula
- Posterior: spine of scapula

Insertion:
- Deltoid tuberosity of humerus

Actions:
- All fibers: Shoulder abduction
  - Anterior:
    - Shoulder horizontal adduction
    - Shoulder flexion
    - Shoulder medial rotation
  - Posterior:
    - Shoulder horizontal abduction
    - Shoulder extension
    - Shoulder lateral rotation
**Deltoid**

**Origin:**
- Anterior: lateral third of clavicle
- Middle: acromion process of scapula
- Posterior: spine of scapula

**Insertion:**
- Deltoid tuberosity of humerus

**Actions:**
- All fibers: Shoulder abduction
- **Anterior:**
  - Shoulder horizontal adduction
  - Shoulder flexion
  - Shoulder medial rotation
- **Posterior:**
  - Shoulder horizontal abduction
  - Shoulder extension
  - Shoulder lateral rotation
Deltoid

Origin:
Anterior: lateral third of clavicle
Middle: acromion process of scapula
Posterior: spine of scapula

Insertion:
Deltoid tuberosity of humerus

Actions:
All fibers: Shoulder abduction
Anterior:
Shoulder horizontal adduction
Shoulder flexion
Shoulder medial rotation
Posterior:
Shoulder horizontal abduction
Shoulder extension
Shoulder lateral rotation
**Pectoralis Major**

**Origin:**
- Clavicular head:
  - Medial half of clavicle
- Sternocostal head:
  - Sternum and cartilages of 1-6 ribs

**Insertion:**
- Crest of the greater tubercle of humerus

**Actions:**
- All fibers:
  - Shoulder adduction
  - Shoulder medial rotation
- Upper fibers:
  - Shoulder horizontal adduction
  - Shoulder flexion
- Lower fibers:
  - Shoulder extension
Pectoralis Major

Origin:
   - Clavicular head: Medial half of clavicle
   - Sternocostal head: Sternum and cartilages of 1-6 ribs

Insertion:
   - Crest of the greater tubercle of humerus

Actions:
   - All fibers: Shoulder adduction, Shoulder medial rotation
   - Upper fibers: Shoulder horizontal adduction, Shoulder flexion
   - Lower fibers: Shoulder extension
Pectoralis Major

Origin:
  Clavicular head:
    Medial half of clavicle
  Sternocostal head:
    Sternum and cartilages of 1-6 ribs

Insertion:
  Crest of the greater tubercle of humerus

Actions:
  All fibers:
    Shoulder adduction
    Shoulder medial rotation
  Upper fibers:
    Shoulder horizontal adduction
    Shoulder flexion
  Lower fibers:
    Shoulder extension
**Pectoralis Major**

**Origin:**
- Clavicular head:
  - Medial half of clavicle
- Sternocostal head:
  - Sternum and cartilages of 1-6 ribs

**Insertion:**
- Crest of the greater tubercle of humerus

**Actions:**
- All fibers:
  - Shoulder adduction
  - Shoulder medial rotation
- Upper fibers:
  - Shoulder horizontal adduction
  - Shoulder flexion
- **Lower fibers:**
  - Shoulder extension
Biceps Brachii

Origin:
- Short head: coracoid process of the scapula
- Long head: supraglenoid tubercle of the scapula

Insertion:
- Tuberosity of the radius
- Aponeurosis of the biceps brachii

Actions:
- Elbow flexion
- Forearm supination
- Shoulder flexion
**Biceps Brachii**

**Origin:**
- Short head: coracoid process of the scapula
- Long head: supraglenoid tubercle of the scapula

**Insertion:**
- Tuberosity of the radius
- Aponeurosis of the biceps brachii

**Actions:**
- Elbow flexion
- Forearm supination
- Shoulder flexion
**Triceps Brachii**

**Origin:**
- Long head: infraglenoid tubercle of the scapula
- Lateral head: upper posterior humerus
- Medial head: lower posterior humerus

**Insertion:**
- Olecranon process of the scapula

**Actions:**
- Elbow extension
- Shoulder extension
- Shoulder adduction
Triceps Brachii

Origin:
- Long head: infraglenoid tubercle of the scapula
- Lateral head: upper posterior humerus
- Medial head: lower posterior humerus

Insertion:
- Olecranon process of the scapula

Actions:
- Elbow extension
- Shoulder extension
- Shoulder adduction