16a A&P: Skeletal System - Synovial Joints

# 16a A&P: Skeletal System - Synovial Joints Class Outline

5 minutesAttendance, Breath of Arrival, and Reminders10 minutesLecture: AOI- Scalenes25 minutesLecture:15 minutesActive study skills:60 minutesTotal

### 16a A&P: Skeletal System - Synovial Joints Class Reminders

#### **Assignments:**

17a Review Questions (A: 131-140)

#### **Quizzes and Exams:**

- 17a Quiz
- 18a Kinesiology Quiz (biceps brachii, coracobrachialis, sternocleidomastoid, levator scapula, scalenes, frontalis, occipitalis, temporalis, masseter)
- 19a Quiz
- 21a Exam

#### **Preparation for upcoming classes:**

- 17a Quiz and A&P: Skeletal System Joint Actions and Articulations
  - Trail Guide: frontalis, occipitalis, temporalis, and masseter
  - Trail Guide: Pages 23-24 and 34
  - Salvo: Pages 422-427
  - Packet E: 25-26
  - RQ Packet A-139
- 17b Kinesiology: AOIs Anterior Shoulder, Anterior Neck, and Head
- 21b CPR / First Aid: This class cannot cannot be made in the make-up room. To schedule a sitin, students should contact the Student Administrator. To be exempt, bring a copy of your CPR & first aid certificate.

### **Classroom Rules**

### Punctuality - everybody's time is precious

- Be ready to learn at the start of class; we'll have you out of here on time
- Tardiness: arriving late, returning late after breaks, leaving during class, leaving early

### The following are not allowed:

- Bare feet
- Side talking
- Lying down
- Inappropriate clothing
- Food or drink except water
- Phones that are visible in the classroom, bathrooms, or internship

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

# Scalenes Trail Guide, Page 247



Anterolateral View

### Scalenes

are sandwiched between the SCM and the anterior flap of the trapezius.

During inhalation, the scalenes perform the vital task of elevating the upper ribs.

### Unilateral actions of the Scalenes





Lateral flexion of the head and neck

Rotation of the head and neck to the opposite

### Bilateral actions of the Scalenes



Elevate the ribs during inhalation



Flexion of the head and neck

#### Anterior scalene

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### Middle scalene



#### Posterior scalene





Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

### Bilaterally:

Elevate the ribs during inhalation Flex the head and neck (anterior only)

0







Lateral View



Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

Bilaterally:

Elevate the ribs during inhalation Flex the head and neck (anterior only)











Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

### Bilaterally:

Elevate the ribs during inhalation Flex the head and neck (anterior only)







Lateral View



Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

### Bilaterally:

Elevate the ribs during inhalation Flex the head and neck (anterior only)



Lateral View







Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

### Bilaterally:

Elevate the ribs during inhalation Flex the head and neck (anterior only)









Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

### Bilaterally:

Elevate the ribs during inhalation Flex the head and neck (anterior only)

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**Unilaterally**:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

*Bilaterally:* **Elevate** the ribs during inhalation

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Lateral View



Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

*Bilaterally:* **Elevate** the ribs during inhalation

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Lateral View



Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

*Bilaterally:* **Elevate** the ribs during inhalation









Lateral View



Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

Bilaterally:

Elevate the ribs during inhalation

O T









Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

*Bilaterally:* **Elevate** the ribs during inhalation













**Unilaterally**:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

*Bilaterally:* **Elevate** the ribs during inhalation

0







Lateral View



Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

*Bilaterally:* **Elevate** the ribs during inhalation

0







Lateral View



Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

*Bilaterally:* **Elevate** the ribs during inhalation

0







Lateral View



Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

Bilaterally:

Elevate the ribs during inhalation

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Transverse processes of sixth and seventh cervical vertebrae (posterior tubercles)

Second rib





Unilaterally:

With the ribs fixed, laterally flex the head and neck to the same side Rotate the head and neck to the opposite side

*Bilaterally:* **Elevate** the ribs during inhalation









#### Anterior scalene

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### Middle scalene



#### Posterior scalene



16a A&P: Skeletal System - Synovial Joints E-21



### Joints

### Joint (AKA: articulation or arthrosis) Where bones come together or <u>join</u>.





### Joints

### Physiology

- Enable the body to move.
- Bear the weight of the body.
- Provide stability.





Fibrous / Synarthrotic

Cartilaginous / Amphiarthrotic

Synovial / Diarthrotic



### Fibrous / Synarthrotic

- Connected by dense <u>fibrous</u> connective tissue, consisting mainly of collagen.
- Extremely <u>limited</u> movement.
- Examples: cranial sutures, facial sutures, teeth, and tibiofibular joints







### **Cartilaginous / Amphiarthrotic**

- Connected by <u>cartilage</u>.
- Slightly <u>movable</u>.
- Examples: costochondral joints, pubic symphysis, and intervertebral disk joints







### Synovial / Diarthrotic

- Contains synovial fluid to nourish and lubricate articulation.
- Freely movable.
- Examples: glenohumeral, iliofemoral . . . see E-26 for more examples







Articular cartilage Joint capsule Joint cavity Synovial membrane Synovial fluid Synovial sheath Bursa Meniscus





Articular cartilage Hyaline cartilage covering an epiphysis.





**Joint capsule** Double-layered structure around a synovial joint. The outer layer is fibrous and forms ligaments. The inner layer is the synovial membrane.





### **Joint cavity** Space within a joint capsule. Lined with a <u>synovial</u> membrane.





**Synovial membrane** Membrane joint cavities, synovial sheaths, and bursae.





**Synovial fluid** Fluid secreted by synovial membranes to lubricate and nourish.





**Synovial sheath** Tube-like structure lined with synovial membrane that surrounds <u>long</u> tendons.





**Bursae (s. bursa)** Collapsed sac-like structure with an interior lining of <u>synovial</u> membrane. Contains synovial fluid.





**Menisci (s. meniscus)** Fibrocartilage <u>pads</u> smooth joint movement and absorb shock. Examples: knee and jaw.





Hinge Pivot Ellipsoidal / condyloid Saddle Ball and socket Gliding / planar





Hinge Limited to flexion and <u>extension</u>.







Pivot Limited to <u>rotation</u>.







Ellipsoidal / condyloid Limited to flexion, extension, abduction, and adduction.







**Saddle** Allowing flexion, extension, abduction, adduction, opposition, reposition, and circumduction, but not rotation.





**Posterior View** 



**Ball and socket** Allowing all movements except <u>gliding</u>. Offers the greatest range of motion.





**Gliding / planar** Limited to planar movements but movement may be permitted in all <u>directions</u>.





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