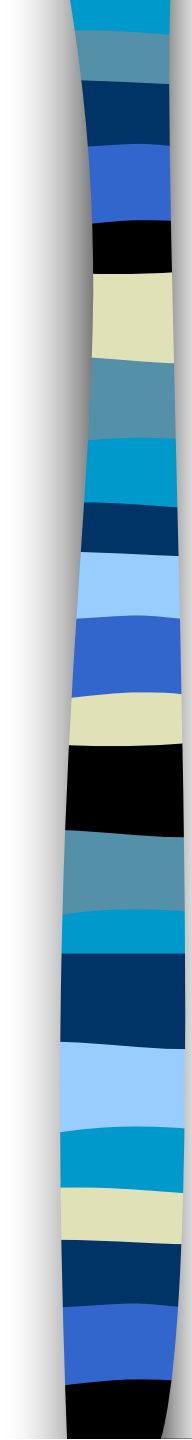
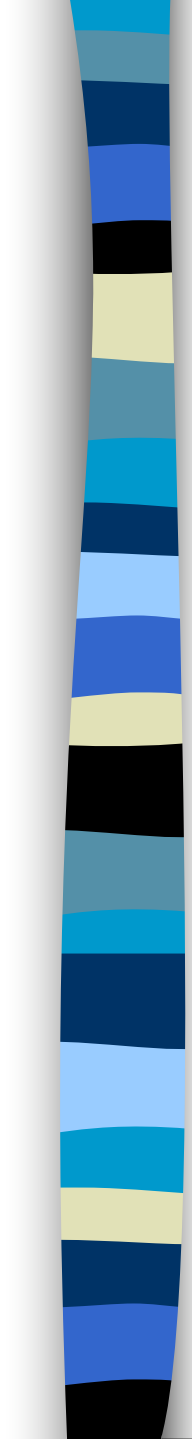


16a A&P: Skeletal System - Synovial Joints



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

5 minutes	Attendance, Breath of Arrival, and Reminders
10 minutes	Lecture: AOI- Scalenes
25 minutes	Lecture:
15 minutes	Active study skills:
60 minutes	Total



16a A&P:

Skeletal System - Synovial Joints

Class Reminders

Assignments:

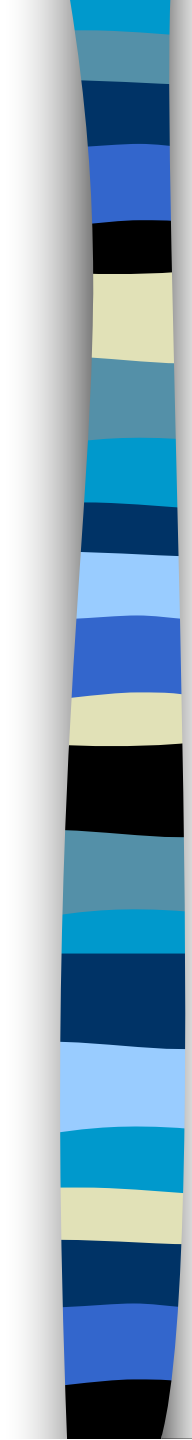
- 17a Review Questions (A: 131-140)

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 be made in the make-up room. To schedule a sit-in, 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

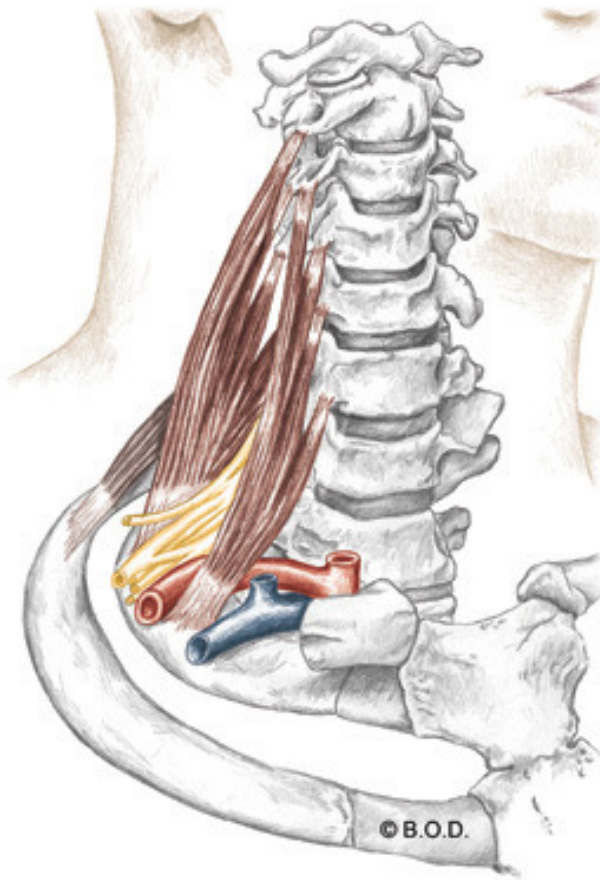
The following are not allowed:

- 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

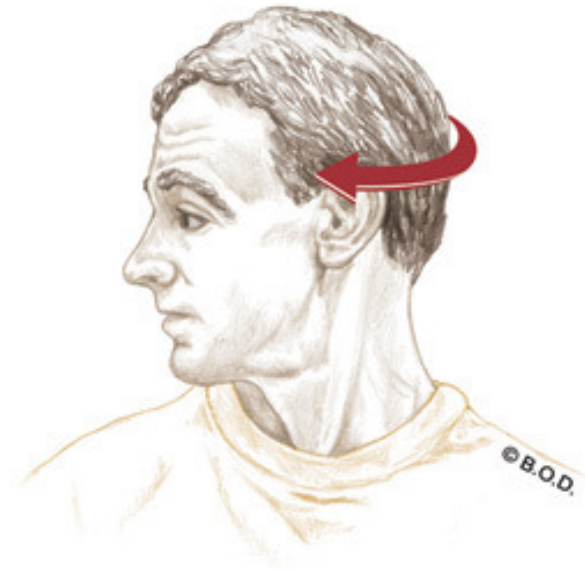
are sandwiched between the SCM and the anterior flap of the trapezius.

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

Unilateral actions of the Scalenes

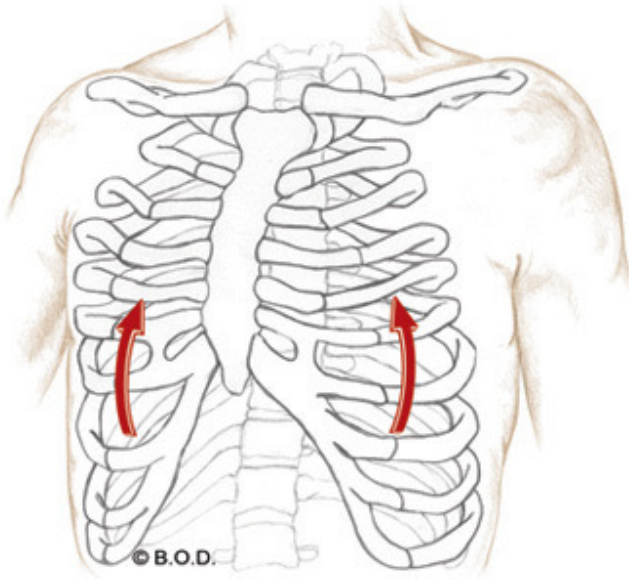


Lateral flexion of the head and neck



Rotation of the head and neck to the opposite

Bilateral actions of the Scalenes

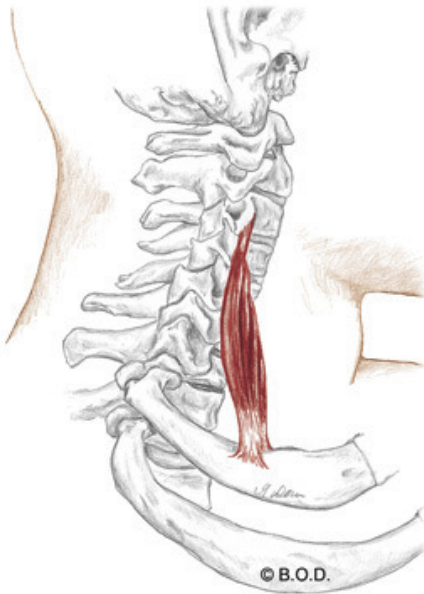


Elevate the ribs during inhalation

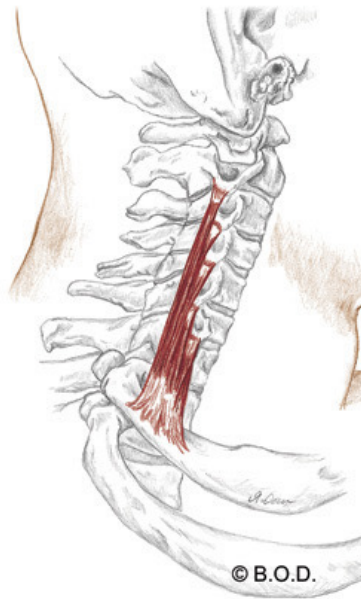


Flexion of the head and neck

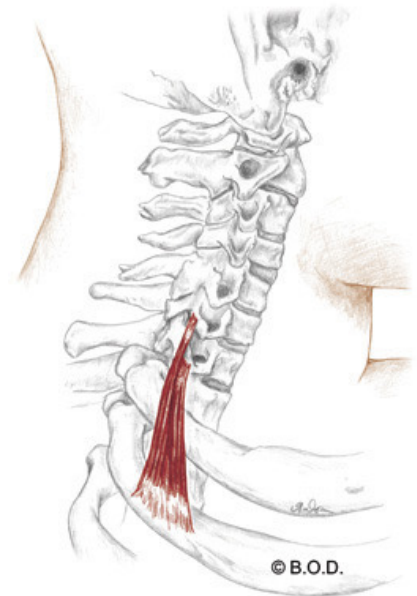
Anterior scalene



Middle scalene



Posterior scalene



Anterior Scalenes, page 247

A *Unilaterally:*

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

Rotate the head and neck to the opposite side

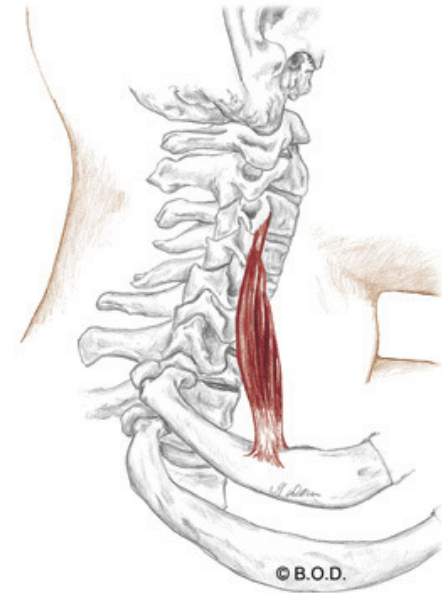
Bilaterally:

Elevate the ribs during inhalation

Flex the head and neck (anterior only)

O Transverse processes of third through sixth cervical vertebrae (anterior tubercles)

I First rib



Lateral View



Anterior Scalenes, page 247

A *Unilaterally:*

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

Rotate the head and neck to the opposite side

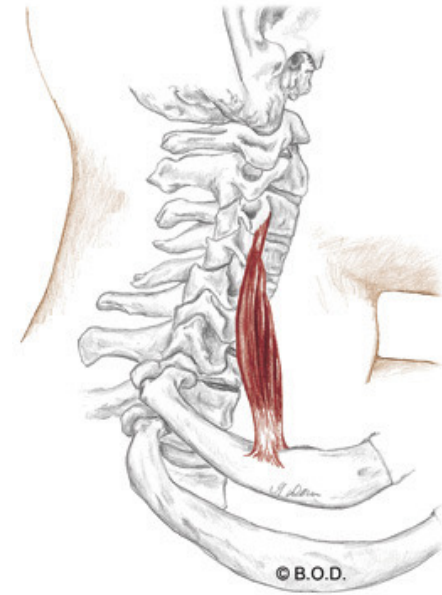
Bilaterally:

Elevate the ribs during inhalation

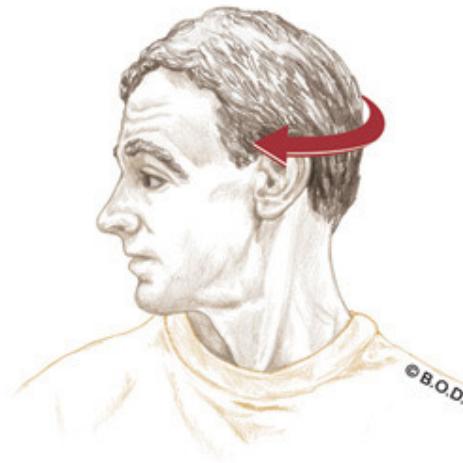
Flex the head and neck (anterior only)

O Transverse processes of third through sixth cervical vertebrae (anterior tubercles)

I First rib



Lateral View



Anterior Scalenes, page 247

A Unilaterally:

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

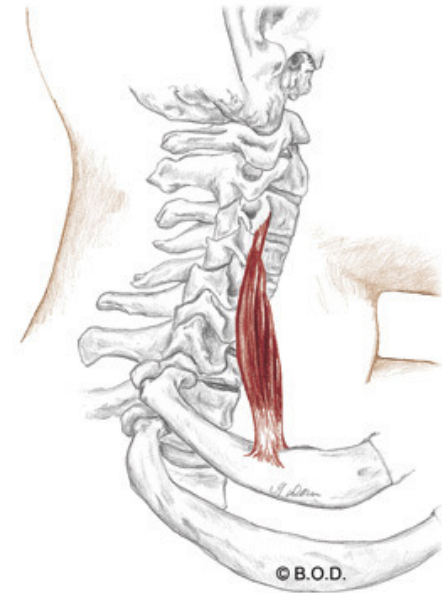
Bilaterally:

Elevate the ribs during inhalation

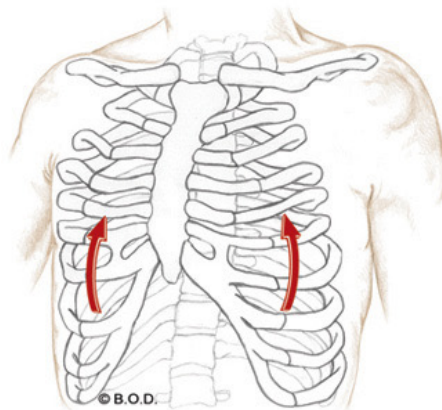
Flex the head and neck (anterior only)

O Transverse processes of third through sixth cervical vertebrae (anterior tubercles)

I First rib



Lateral View



Anterior Scalenes, page 247

A *Unilaterally:*

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

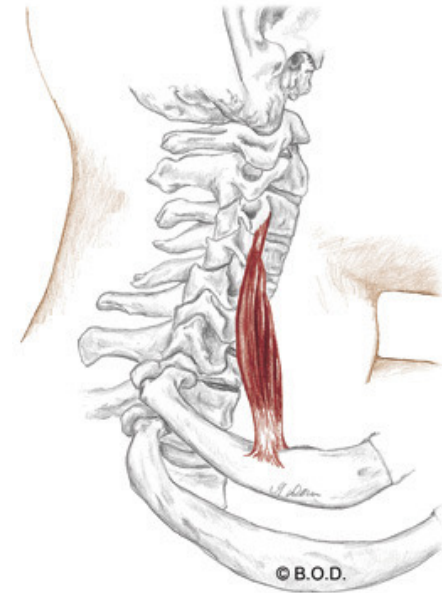
Bilaterally:

Elevate the ribs during inhalation

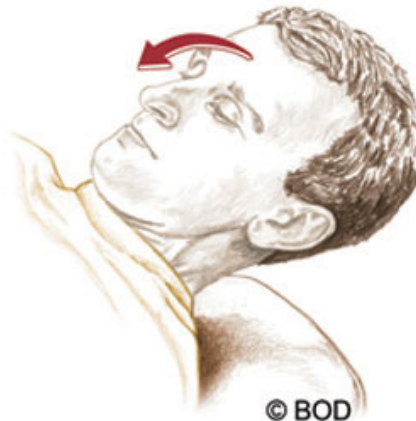
Flex the head and neck (anterior only)

O Transverse processes of third through sixth cervical vertebrae (anterior tubercles)

I First rib



Lateral View



Anterior Scalenes, page 247

A *Unilaterally:*

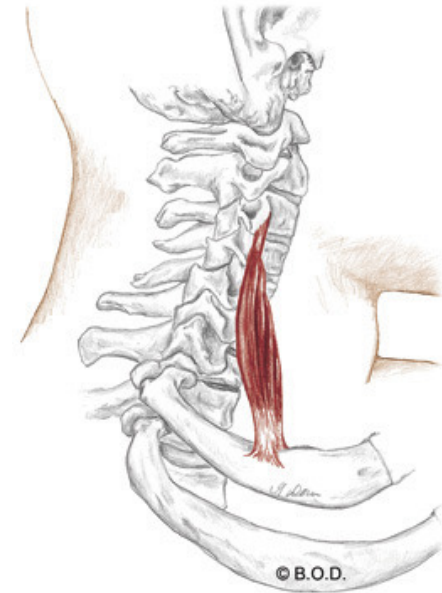
With the ribs fixed, **laterally flex** the head and neck to the same side
Rotate the head and neck to the opposite side

Bilaterally:

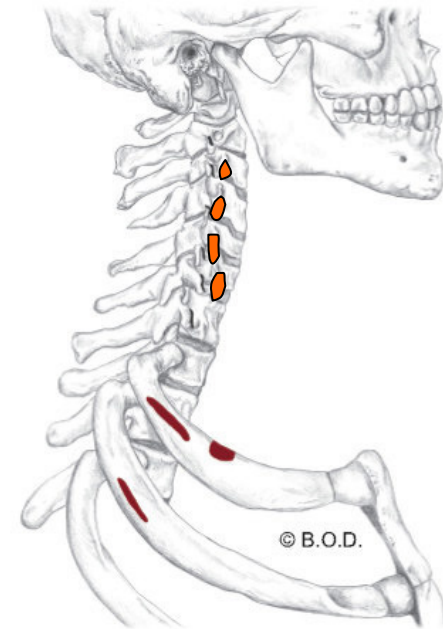
Elevate the ribs during inhalation
Flex the head and neck (anterior only)

O Transverse processes of third through sixth cervical vertebrae (anterior tubercles)

I First rib



Lateral View



Anterior Scalenes, page 247

A *Unilaterally:*

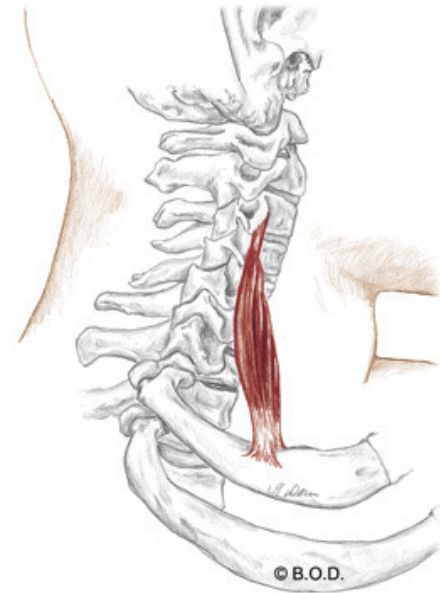
With the ribs fixed, **laterally flex** the head and neck to the same side
Rotate the head and neck to the opposite side

Bilaterally:

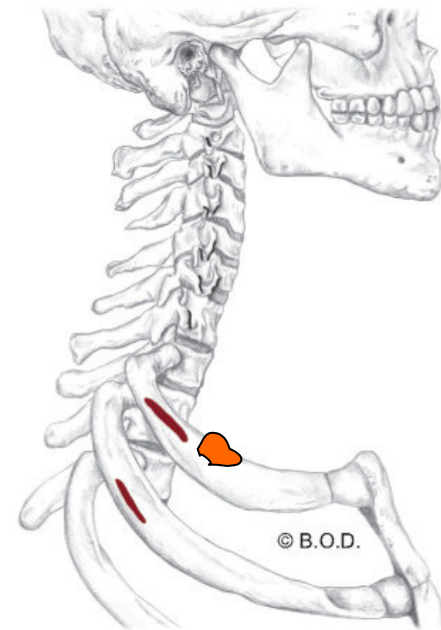
Elevate the ribs during inhalation
Flex the head and neck (anterior only)

O Transverse processes of third through sixth cervical vertebrae (anterior tubercles)

I First rib



Lateral View



Middle Scalenes, page 247

A *Unilaterally:*

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

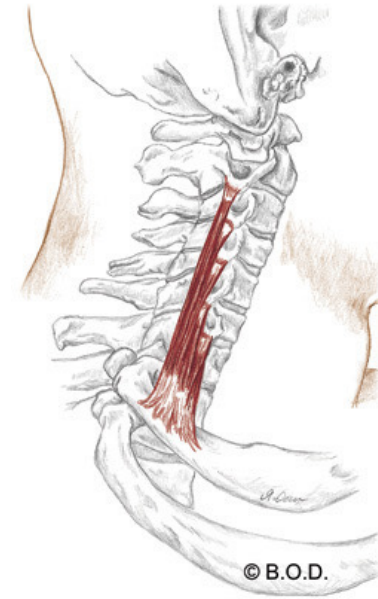
Rotate the head and neck to the opposite side

Bilaterally:

Elevate the ribs during inhalation

O Transverse processes of second through seventh cervical vertebrae (posterior tubercles)

I First rib



Lateral View



Middle Scalenes, page 247

A *Unilaterally:*

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

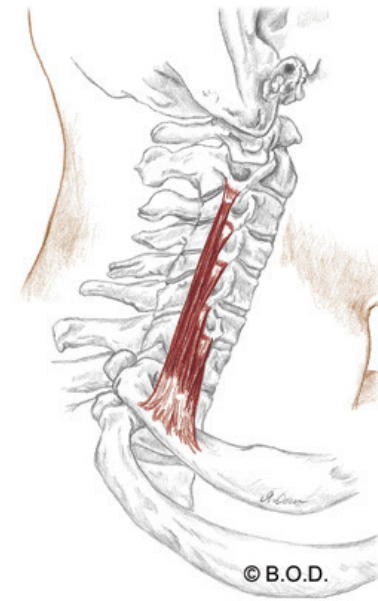
Rotate the head and neck to the opposite side

Bilaterally:

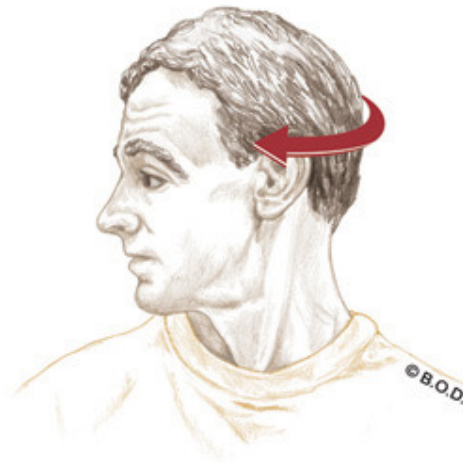
Elevate the ribs during inhalation

O Transverse processes of second through seventh cervical vertebrae (posterior tubercles)

I First rib



Lateral View



Middle Scalenes, page 247

A *Unilaterally:*

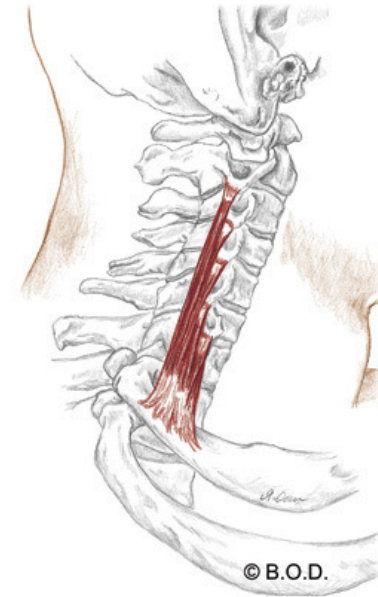
With the ribs fixed, **laterally flex** the head and neck to the same side
Rotate the head and neck to the opposite side

Bilaterally:

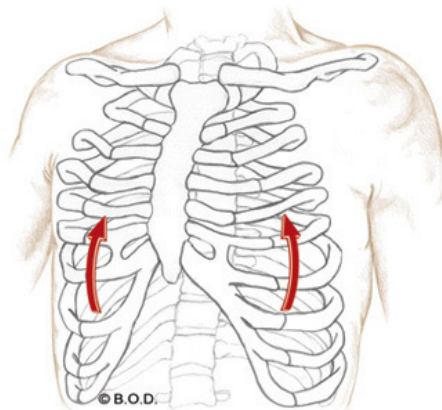
Elevate the ribs during inhalation

O Transverse processes of second through seventh cervical vertebrae (posterior tubercles)

I First rib



Lateral View



Middle Scalenes, page 247

A *Unilaterally:*

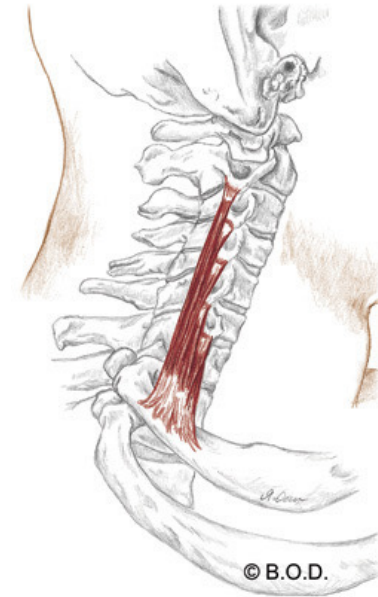
With the ribs fixed, **laterally flex** the head and neck to the same side
Rotate the head and neck to the opposite side

Bilaterally:

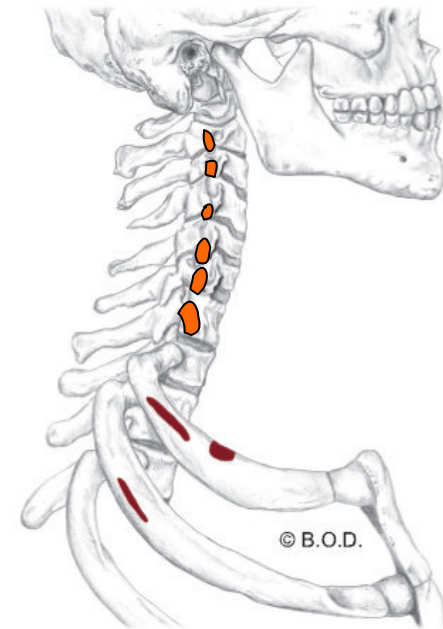
Elevate the ribs during inhalation

O Transverse processes of second through seventh cervical vertebrae (posterior tubercles)

I First rib



Lateral View



Middle Scalenes, page 247

A *Unilaterally:*

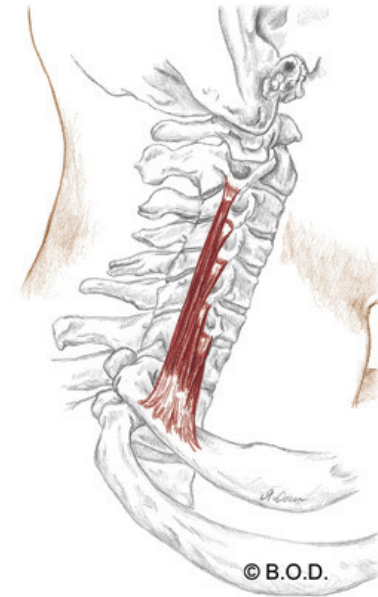
With the ribs fixed, **laterally flex** the head and neck to the same side
Rotate the head and neck to the opposite side

Bilaterally:

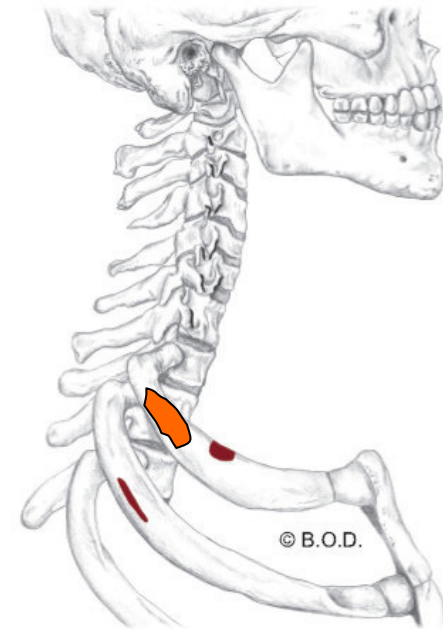
Elevate the ribs during inhalation

O Transverse processes of second through seventh cervical vertebrae (posterior tubercles)

I First rib



Lateral View



Posterior Scalenes, page 247

A *Unilaterally:*

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

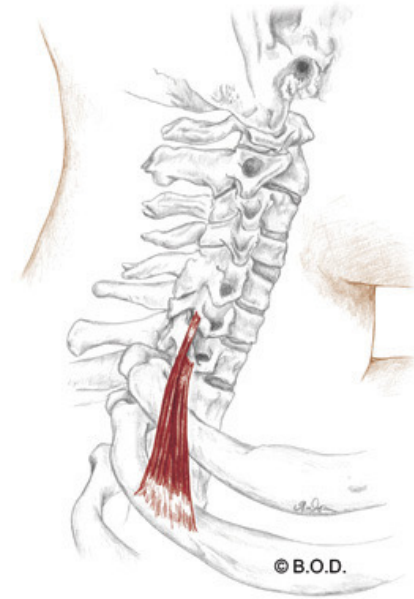
Rotate the head and neck to the opposite side

Bilaterally:

Elevate the ribs during inhalation

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

I Second rib



Lateral View



Posterior Scalenes, page 247

A *Unilaterally:*

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

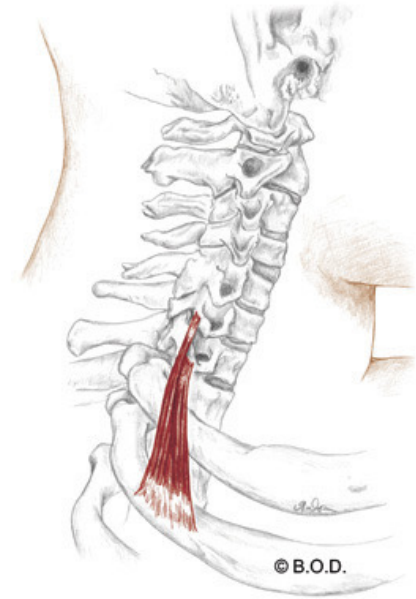
Rotate the head and neck to the opposite side

Bilaterally:

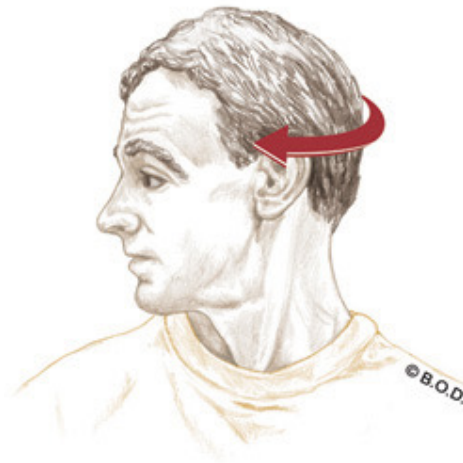
Elevate the ribs during inhalation

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

I Second rib



Lateral View



Posterior Scalenes, page 247

A *Unilaterally:*

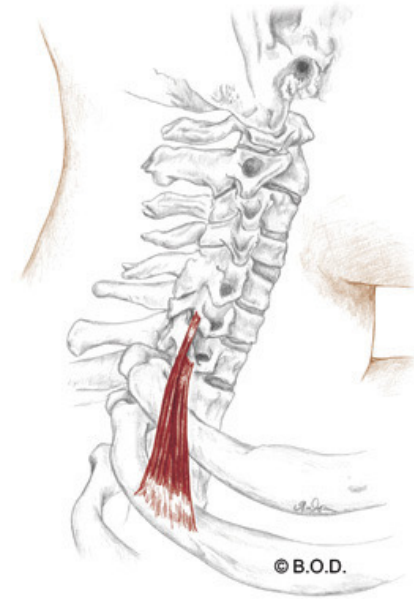
With the ribs fixed, **laterally flex** the head and neck to the same side
Rotate the head and neck to the opposite side

Bilaterally:

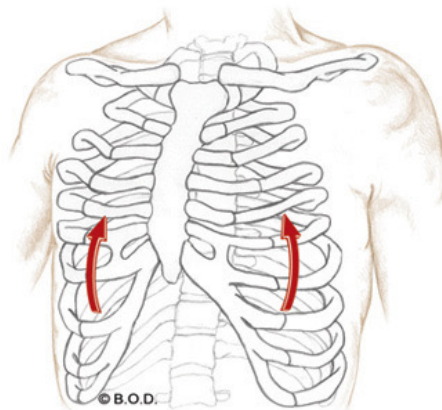
Elevate the ribs during inhalation

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

I Second rib



Lateral View



Posterior Scalenes, page 247

A *Unilaterally:*

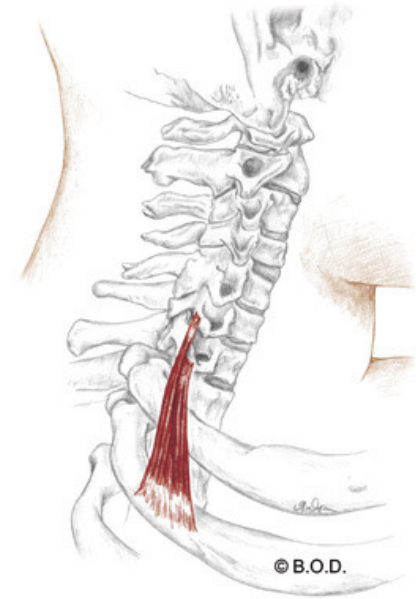
With the ribs fixed, **laterally flex** the head and neck to the same side
Rotate the head and neck to the opposite side

Bilaterally:

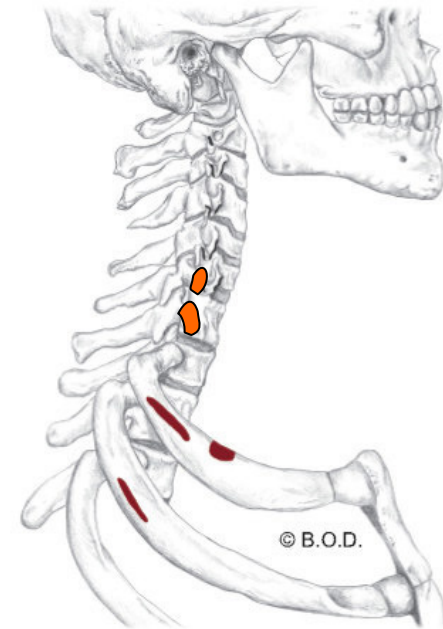
Elevate the ribs during inhalation

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

I Second rib



Lateral View



Posterior Scalenes, page 247

A *Unilaterally:*

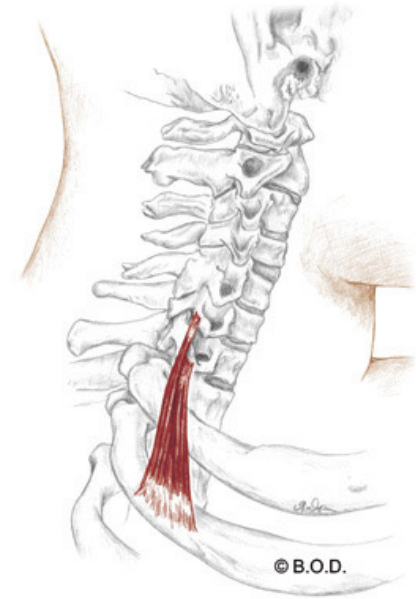
With the ribs fixed, **laterally flex** the head and neck to the same side
Rotate the head and neck to the opposite side

Bilaterally:

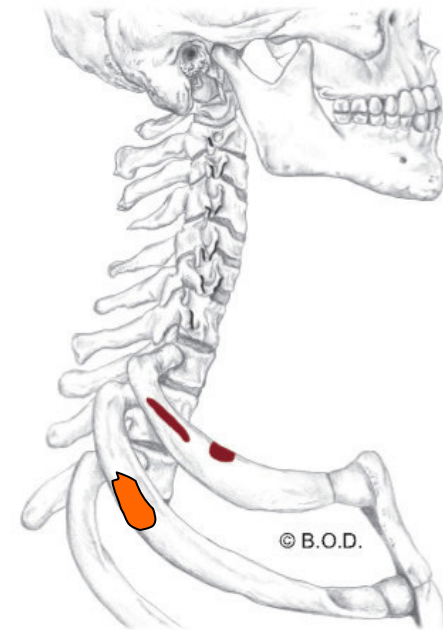
Elevate the ribs during inhalation

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

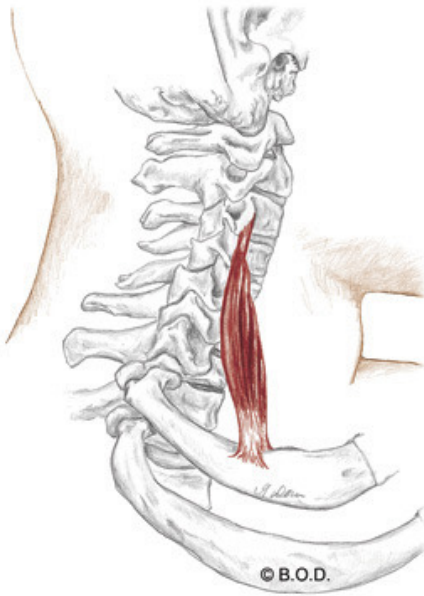
I Second rib



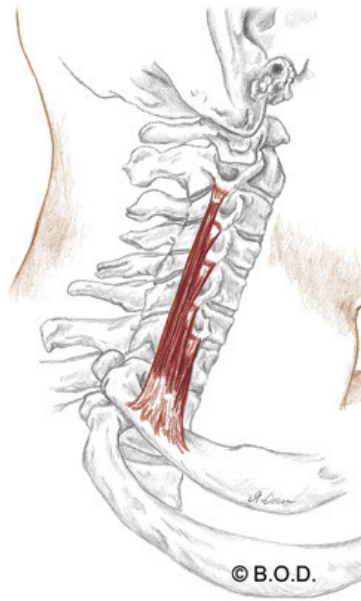
Lateral View



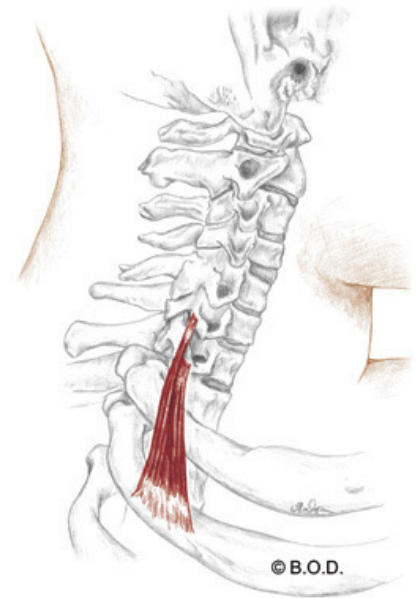
Anterior scalene

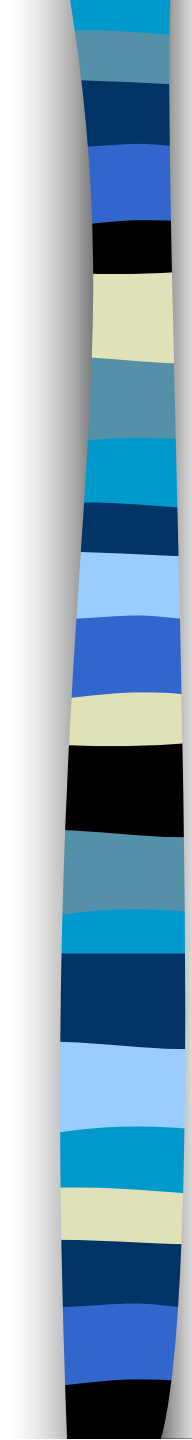


Middle scalene



Posterior scalene

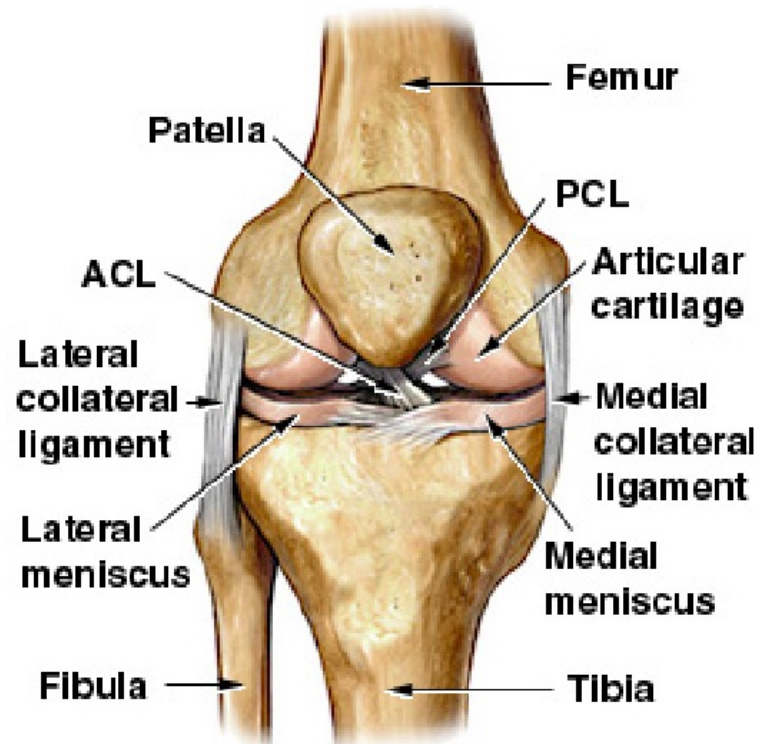




16a A&P: Skeletal System - Synovial Joints E-21

Joints

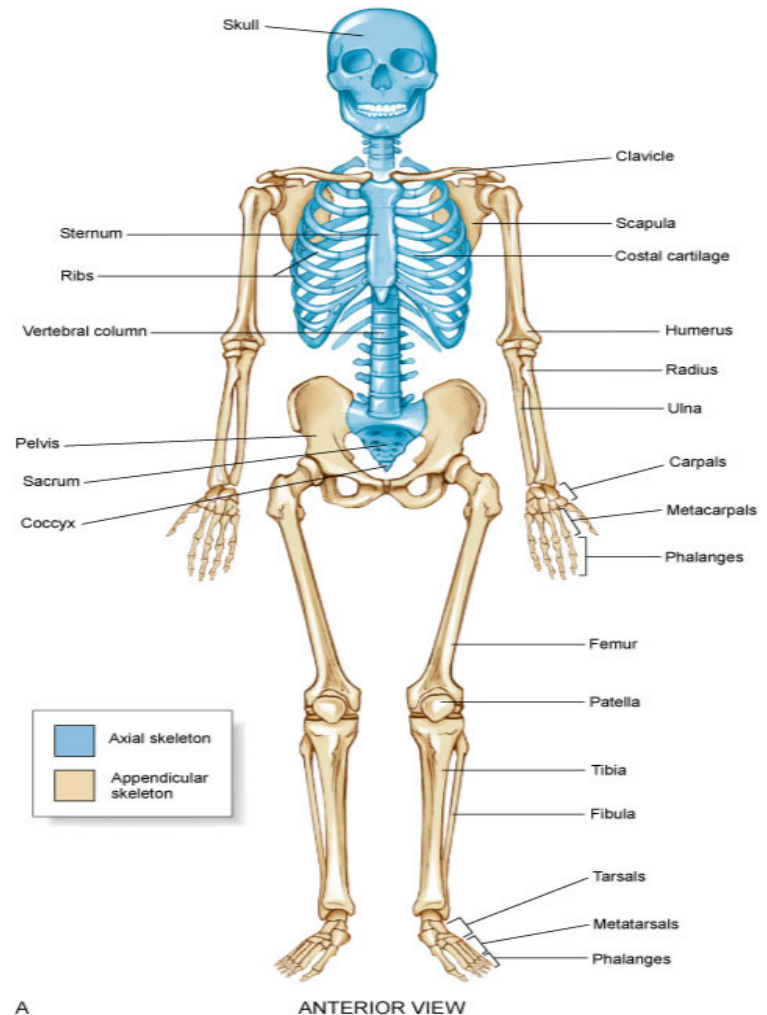
Joint (AKA: articulation or arthrosis) Where bones come together or join.

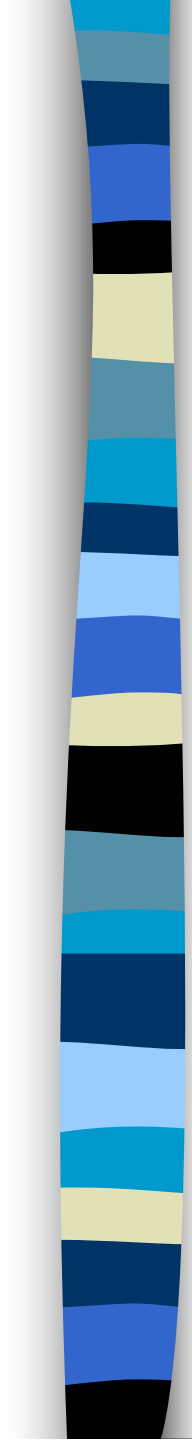


Joints

Physiology

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





Structural and Functional Classification

Fibrous / Synarthrotic

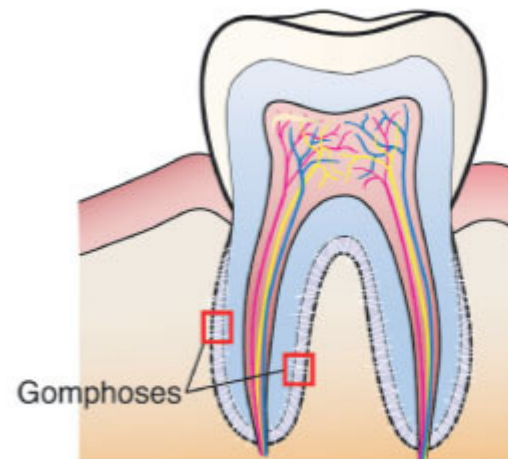
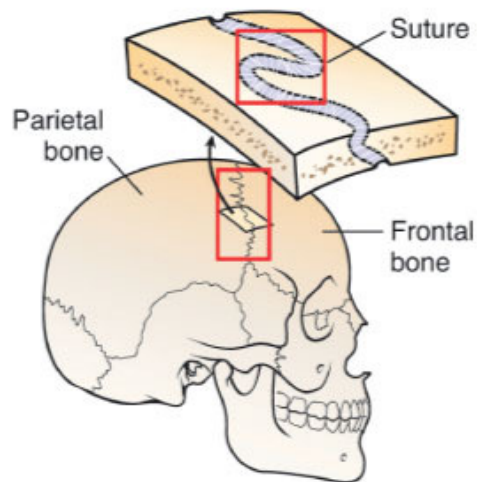
Cartilaginous / Amphiarthrotic

Synovial / Diarthrotic

Structural and Functional Classification

Fibrous / Synarthrotic

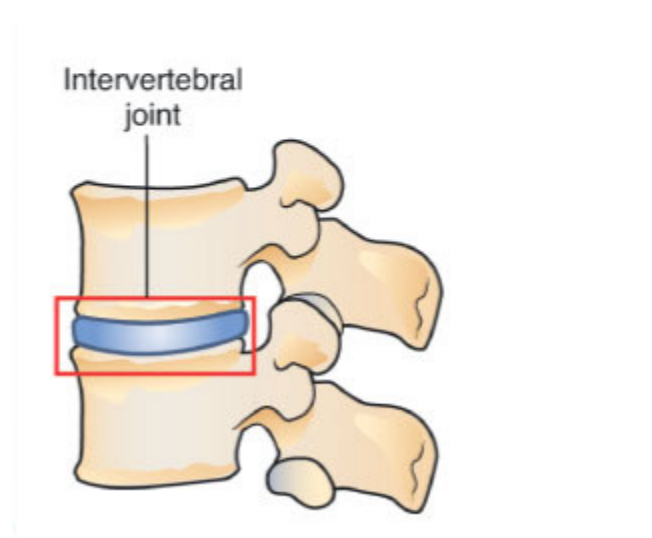
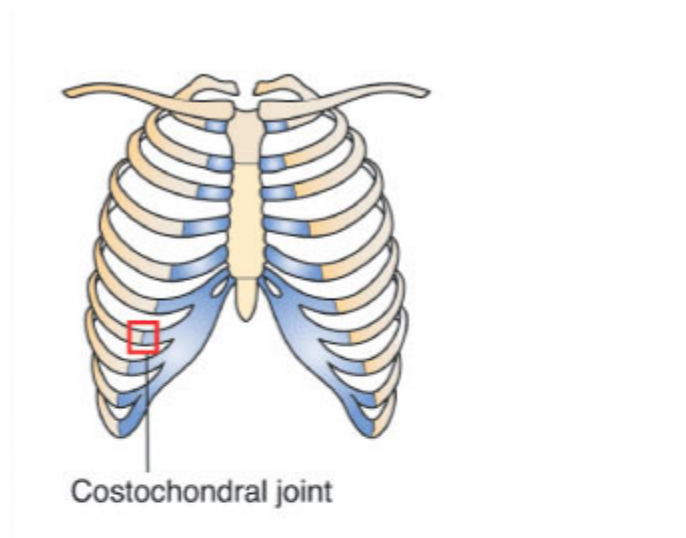
- Connected by dense fibrous connective tissue, consisting mainly of collagen.
- Extremely limited movement.
- Examples: cranial sutures, facial sutures, teeth, and tibiofibular joints



Structural and Functional Classification

Cartilaginous / Amphiarthrotic

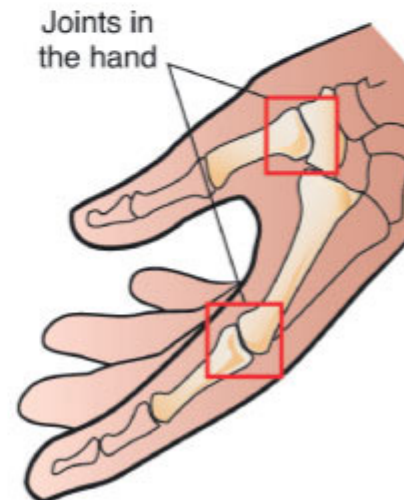
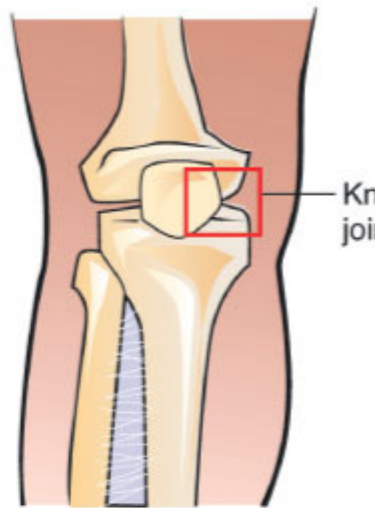
- Connected by cartilage.
- Slightly movable.
- Examples: costochondral joints, pubic symphysis, and intervertebral disk joints



Structural and Functional Classification

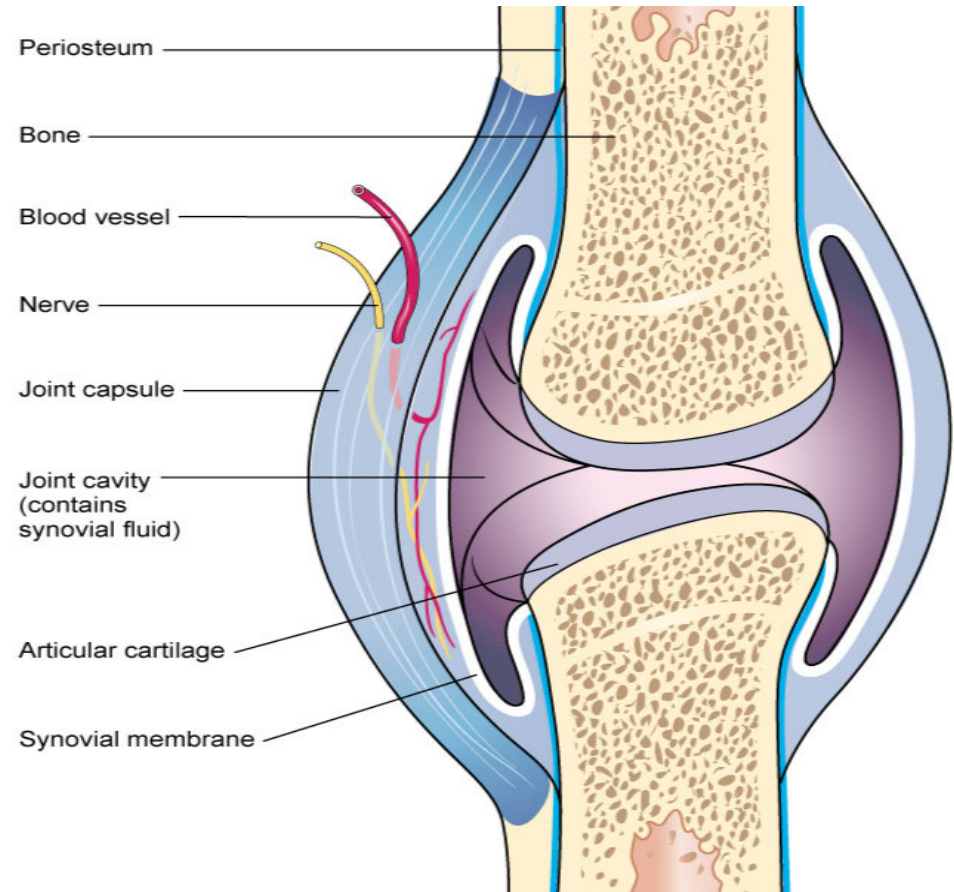
Synovial / Diarthrotic

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



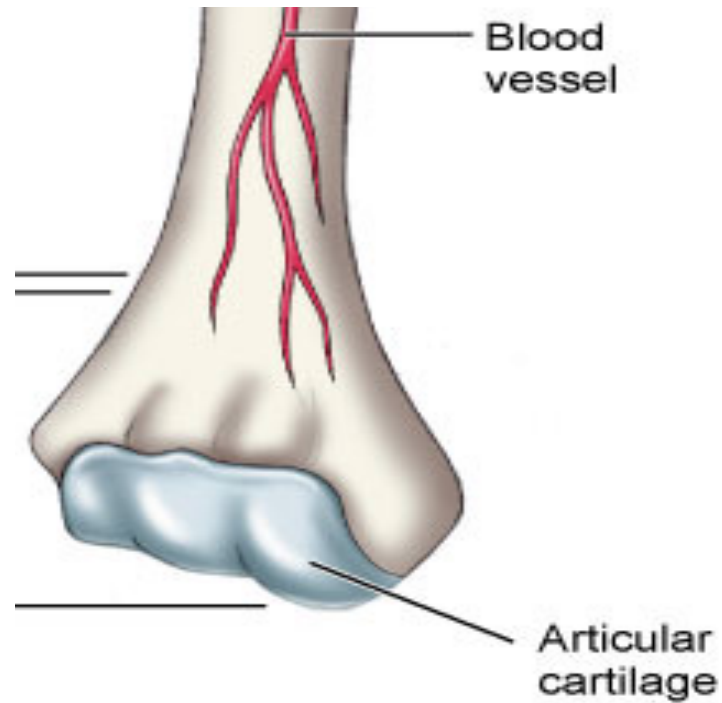
Synovial Joints

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



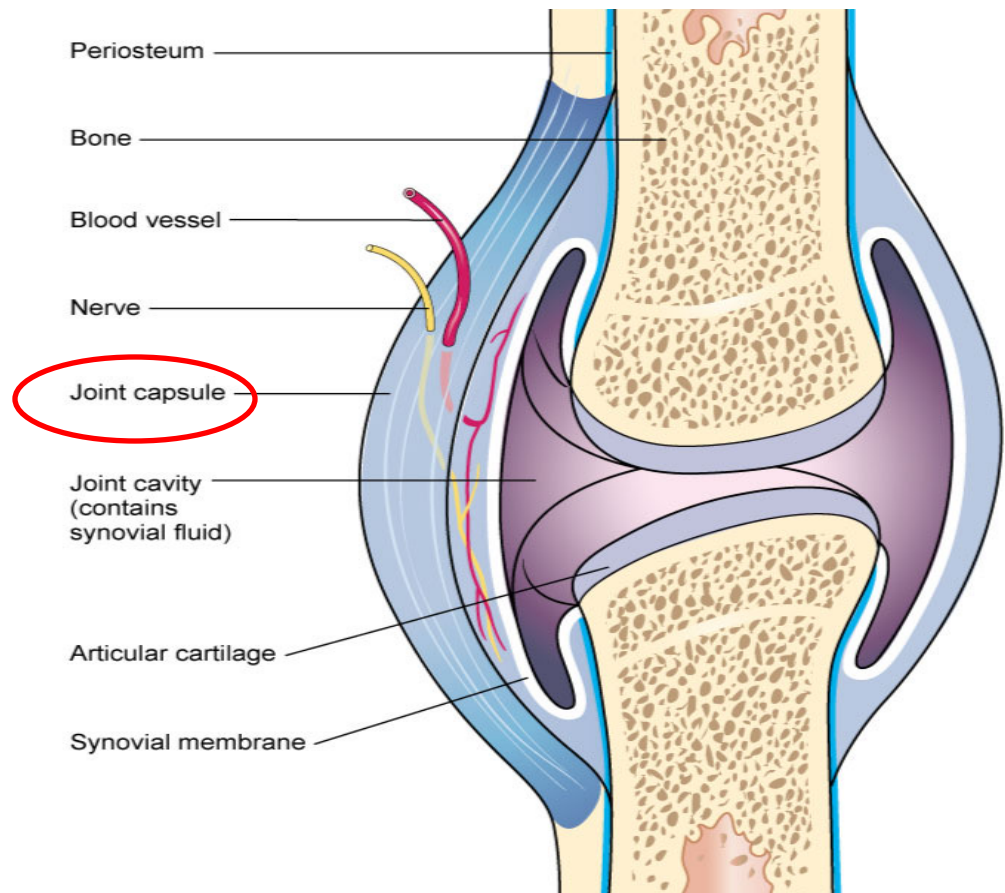
Synovial Joints

Articular cartilage Hyaline cartilage covering an epiphysis.



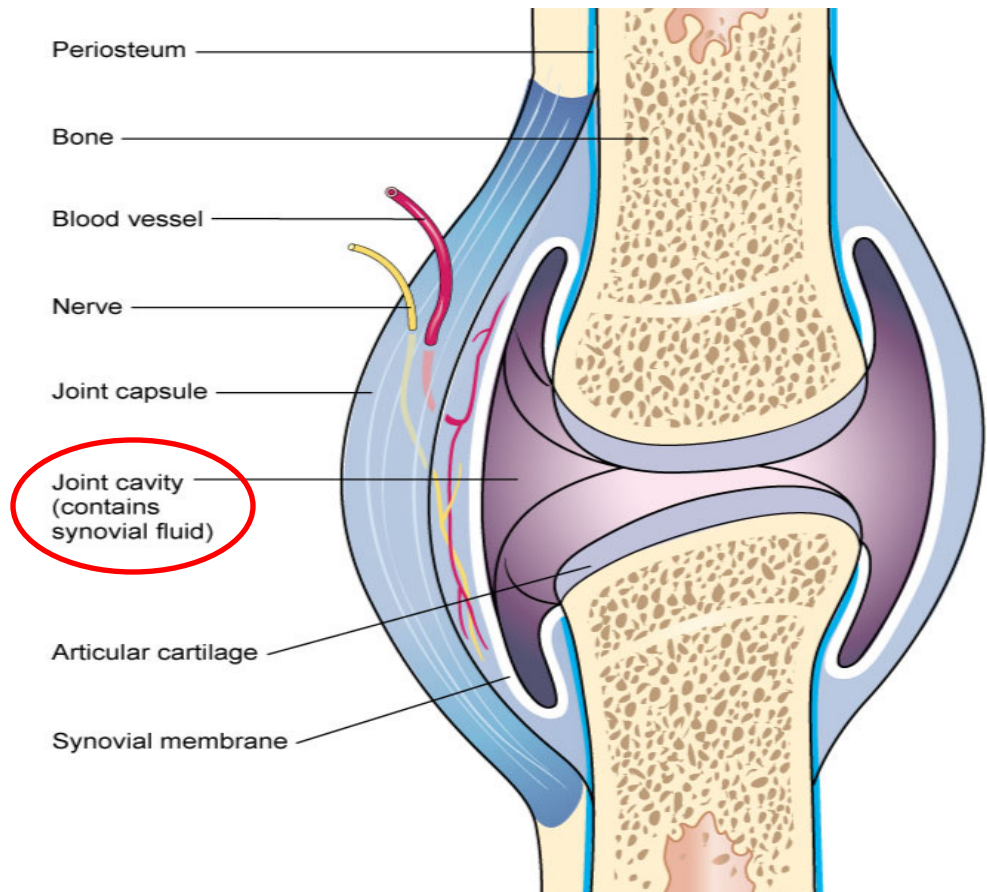
Synovial Joints

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



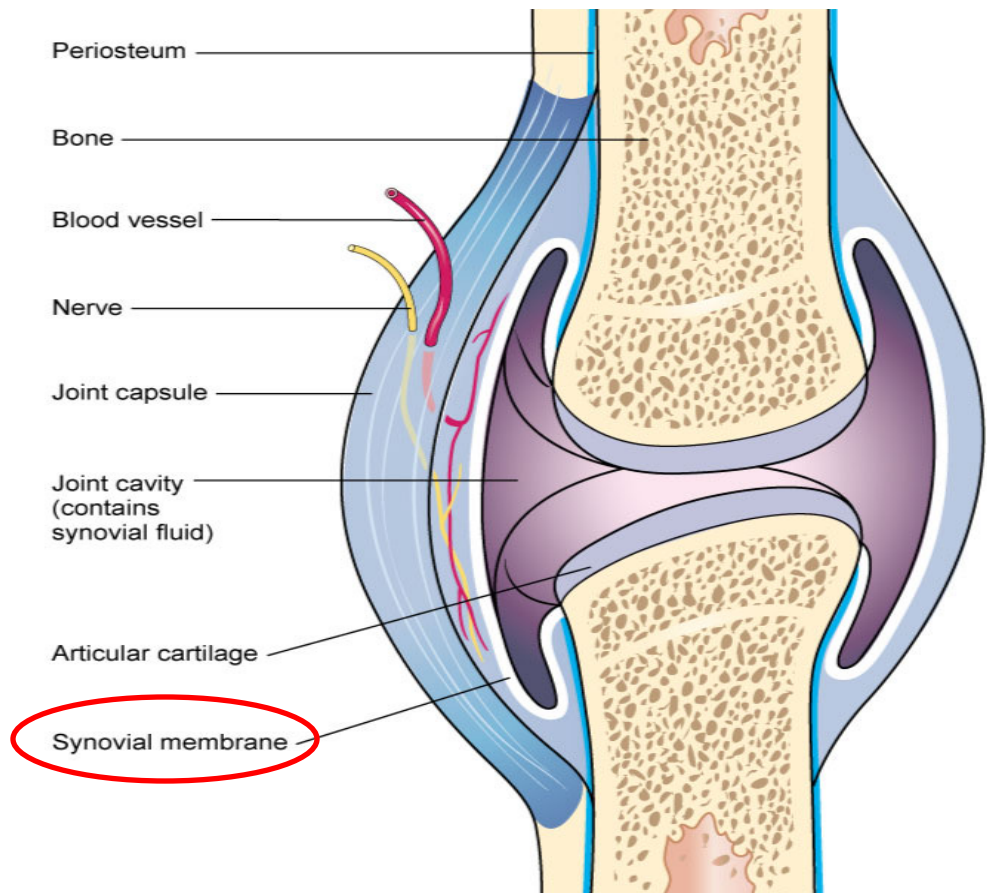
Synovial Joints

Joint cavity Space within a joint capsule. Lined with a synovial membrane.



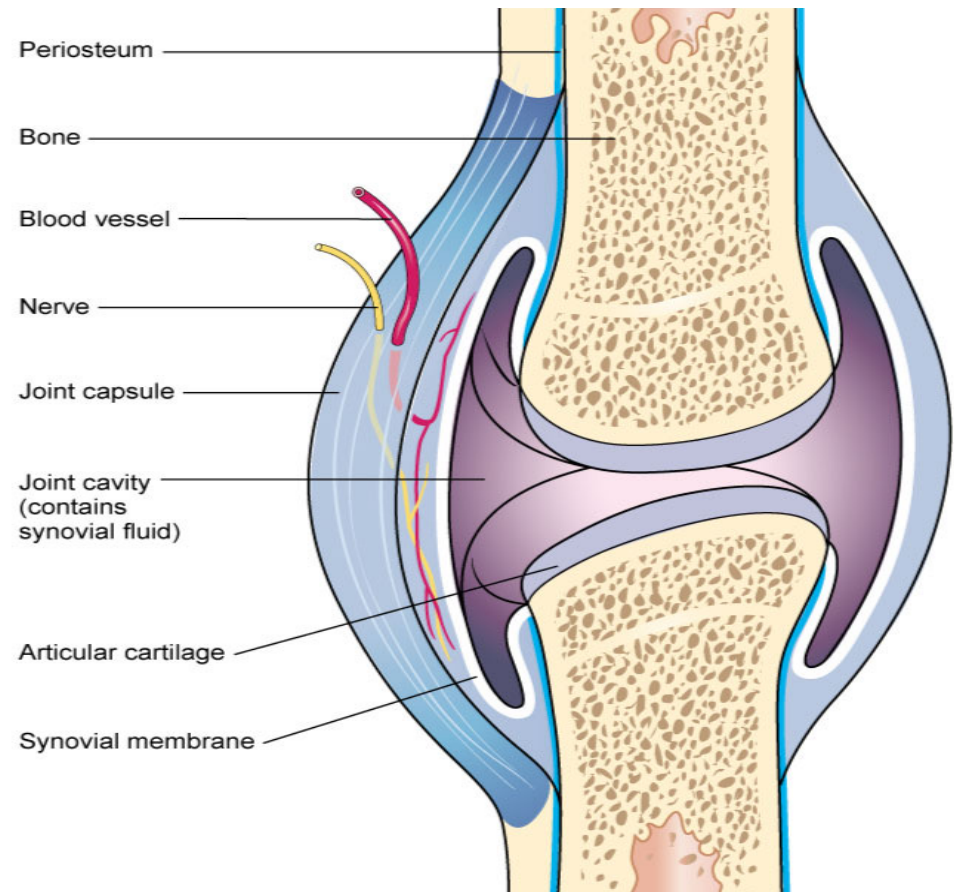
Synovial Joints

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



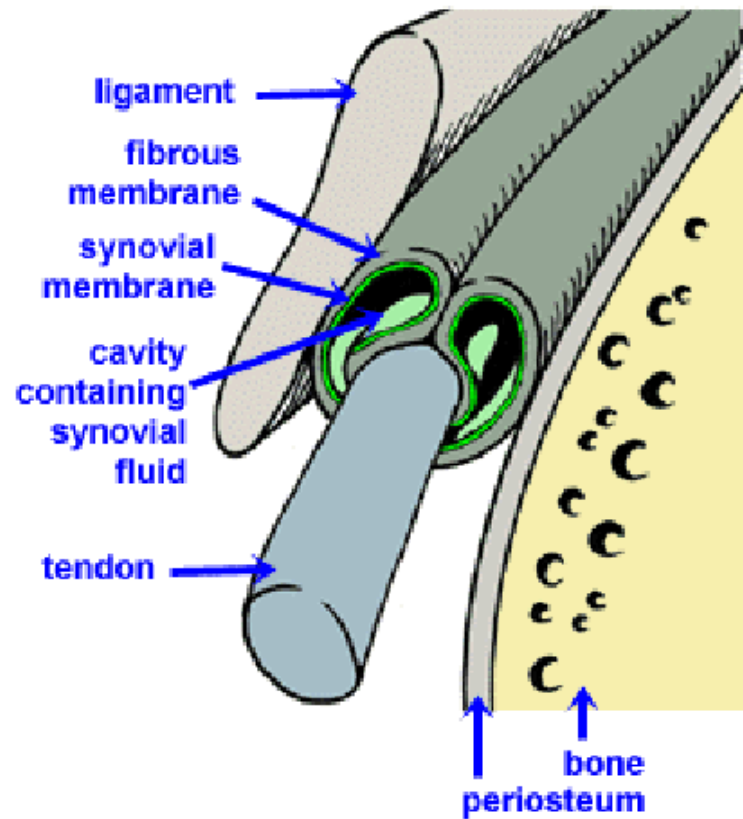
Synovial Joints

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



Synovial Joints

Synovial sheath Tube-like structure lined with synovial membrane that surrounds long tendons.



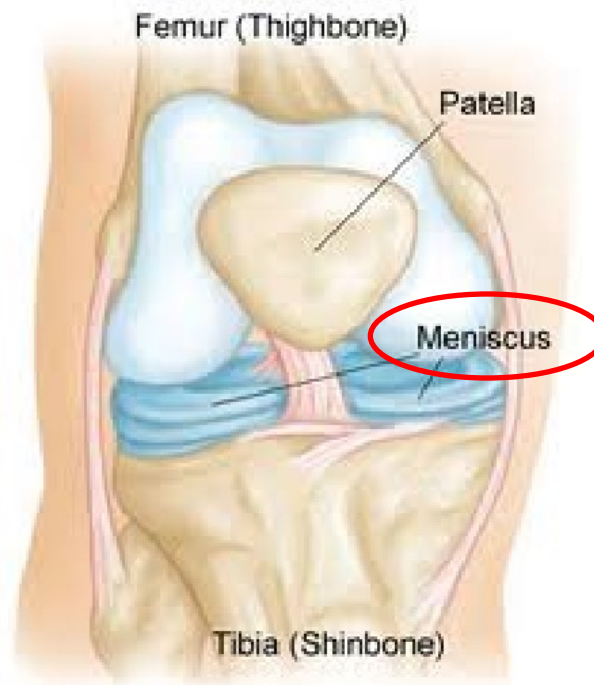
Synovial Joints

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



Synovial Joints

Menisci (s. meniscus) Fibrocartilage pads smooth joint movement and absorb shock. Examples: knee and jaw.



Types of Synovial Joints

Hinge

Pivot

Ellipsoidal / condyloid

Saddle

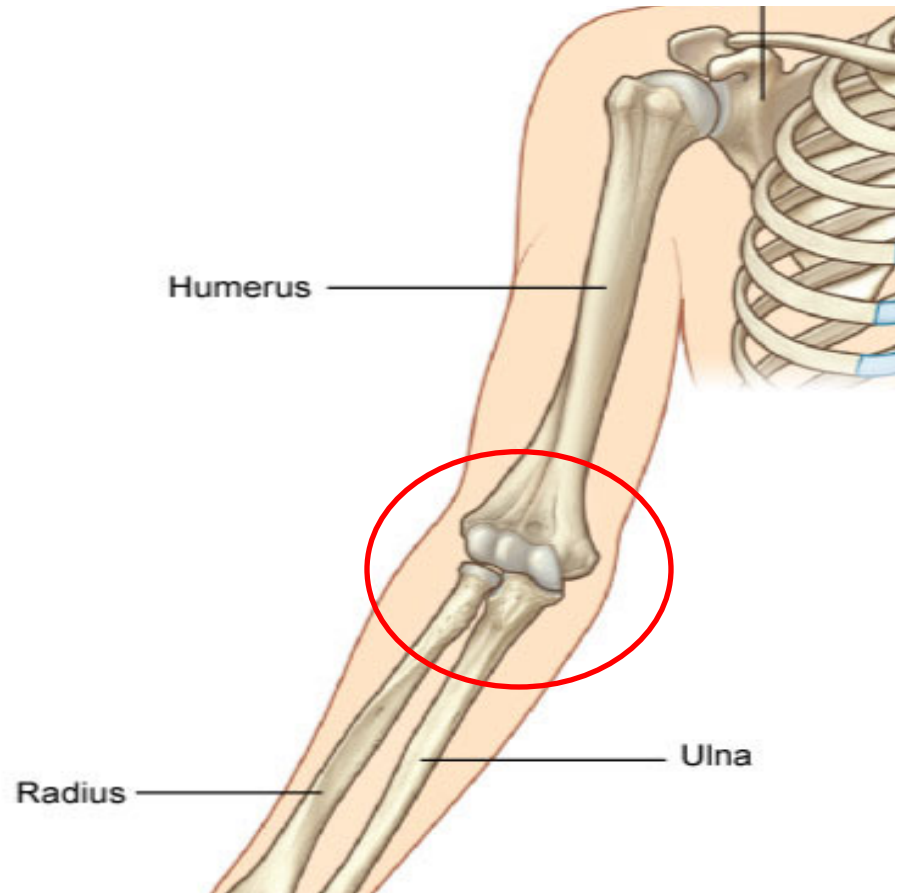
Ball and socket

Gliding / planar



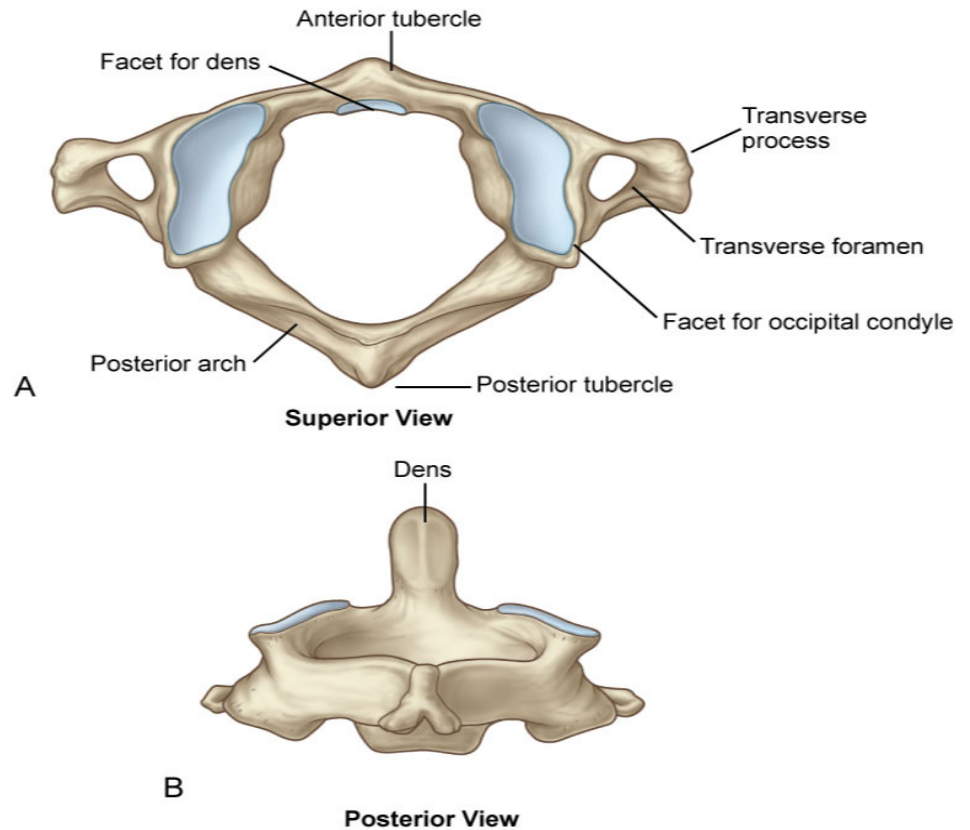
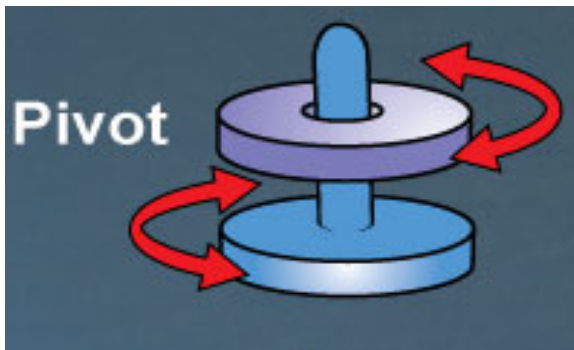
Types of Synovial Joints

Hinge Limited to flexion and extension.



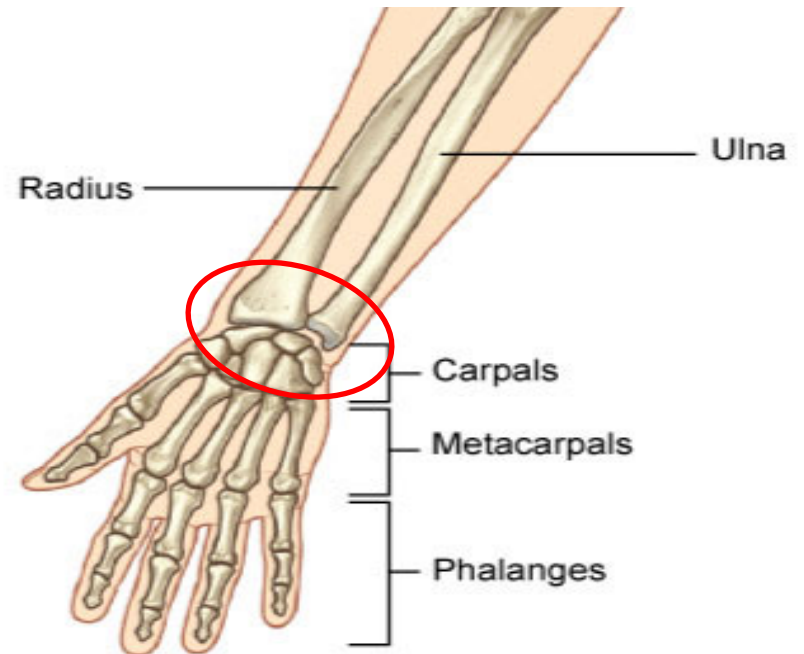
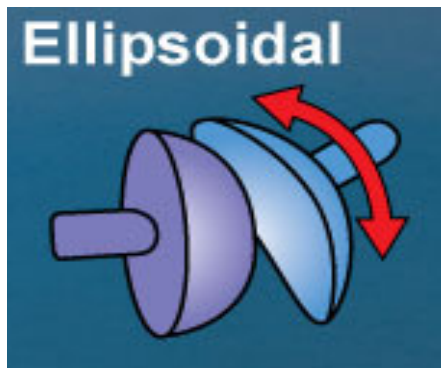
Types of Synovial Joints

Pivot Limited to rotation.



Types of Synovial Joints

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



Types of Synovial Joints

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

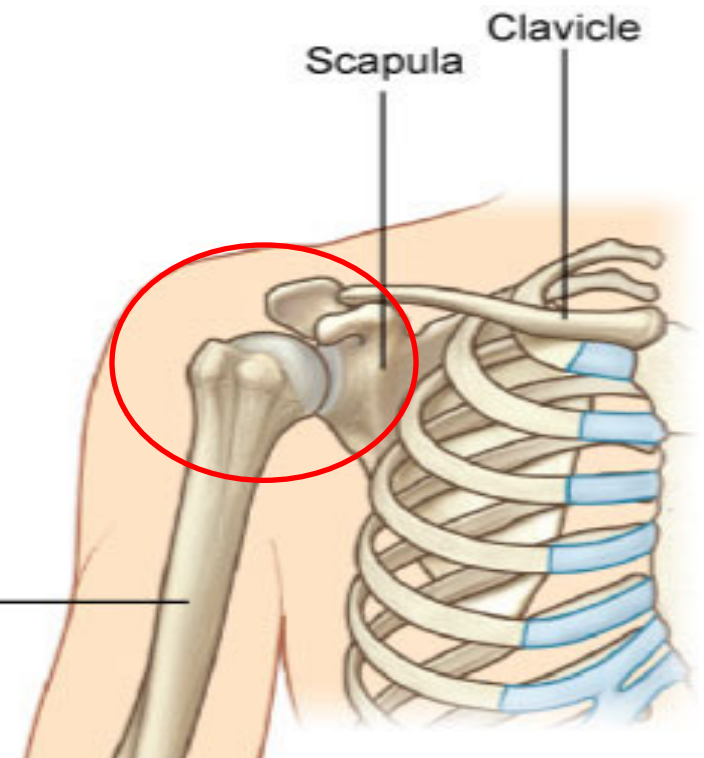


Types of Synovial Joints

Ball and socket Allowing all movements except gliding. Offers the greatest range of motion.

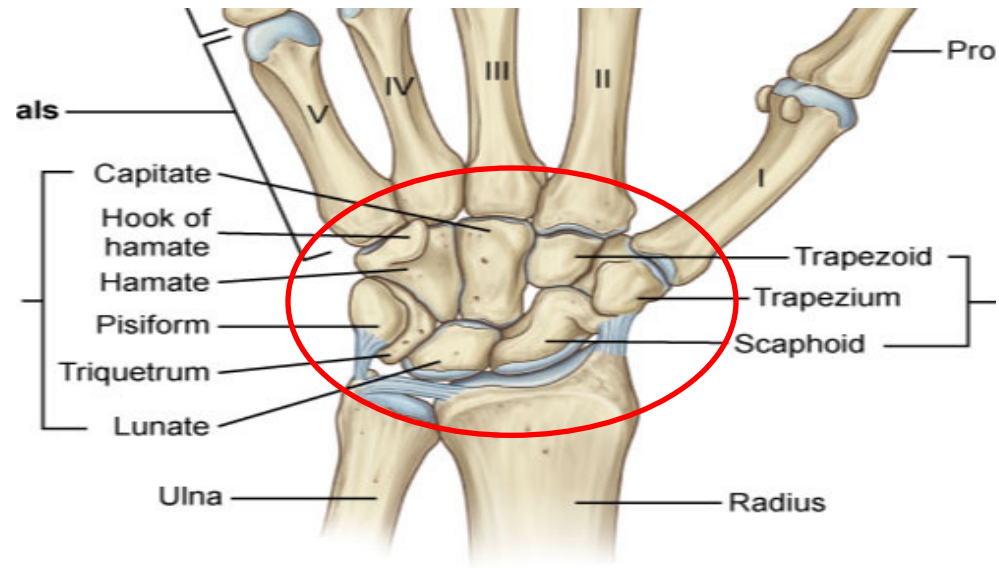
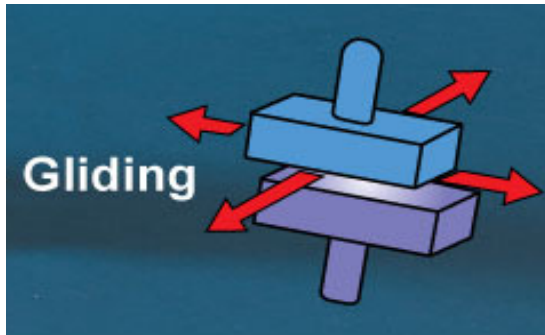


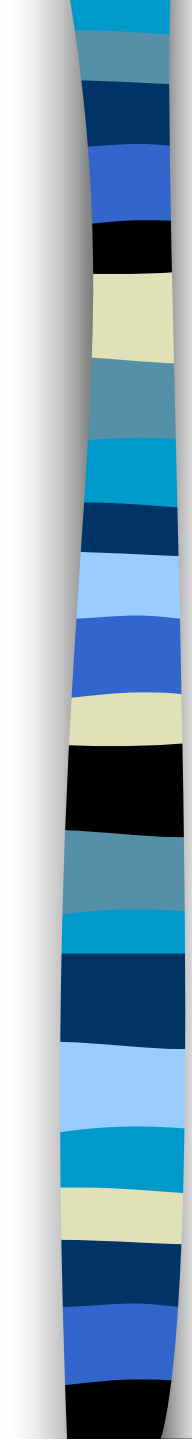
Humerus



Types of Synovial Joints

Gliding / planar Limited to planar movements but movement may be permitted in all directions.





16a A&P: Skeletal System - Synovial Joints