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

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## 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:**

- 17b Kinesiology Quiz (biceps brachii, coracobrachialis, sternocleidomastoid, levator scapula, scalenes, frontalis, occipitalis, temporalis, masseter)

- 17a Quiz
- 19a Quiz

- 21a Exam

**Preparation for upcoming classes:**

- 17a A&P: Skeletal System - Joint Actions and Articulations and Quiz
  - 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

# 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

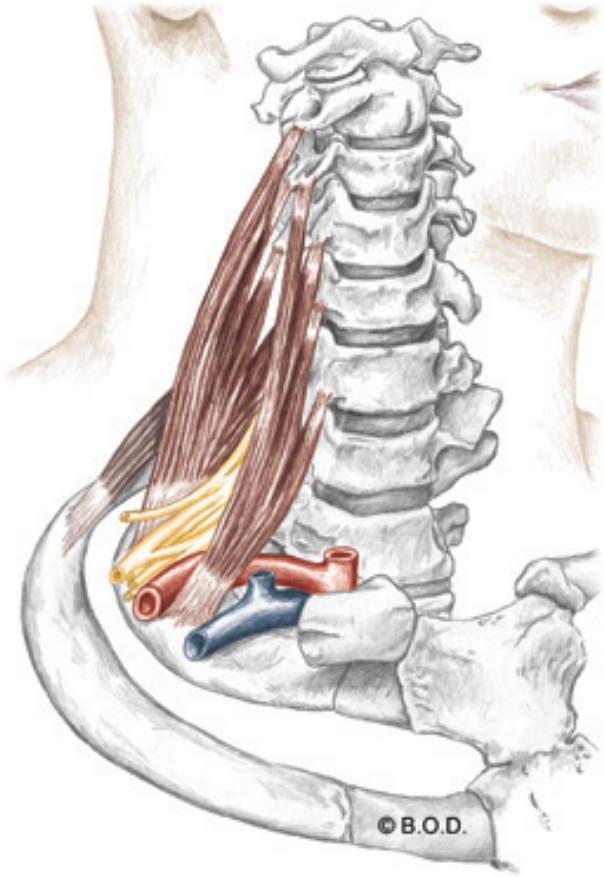
**The following are not allowed:**

- 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.

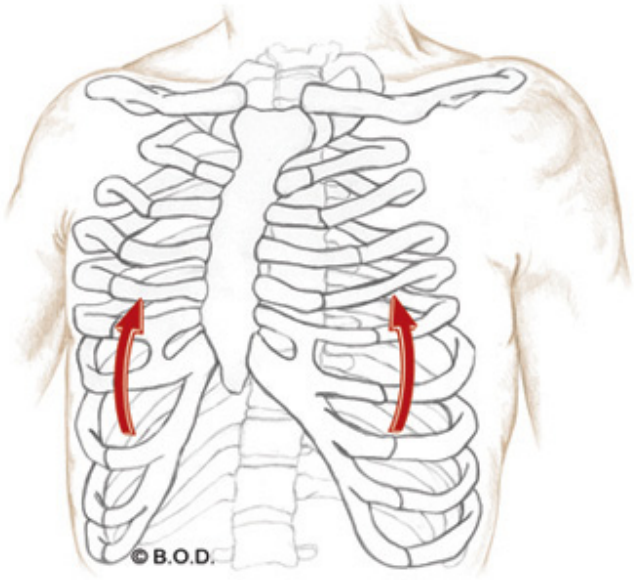
During inhalation, the scalenes perform the vital task of elevating the upper ribs.

# Unilateral actions of the Scalenes


Lateral flexion of the head and neck


Rotation of the head and neck to the opposite

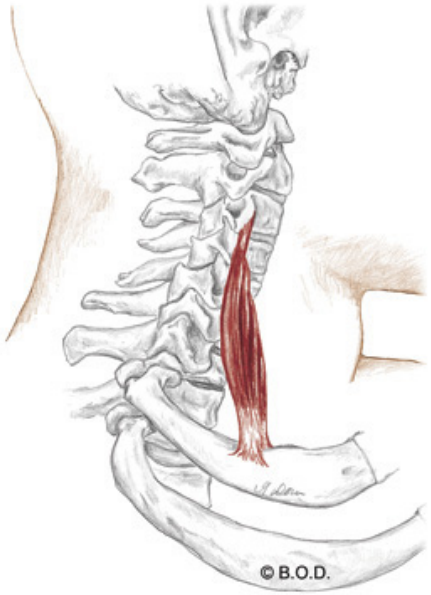
# Bilateral actions of the Scalenes



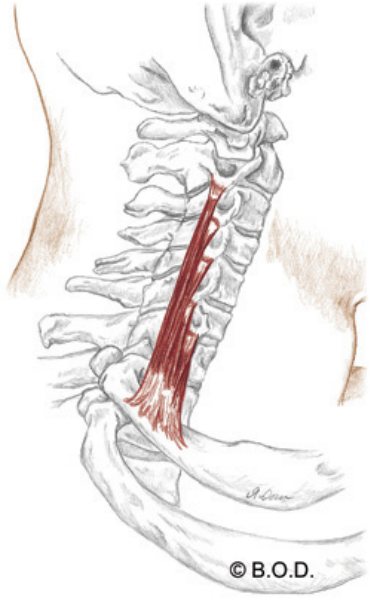

Elevate the ribs during inhalation


Flexion of the head and neck

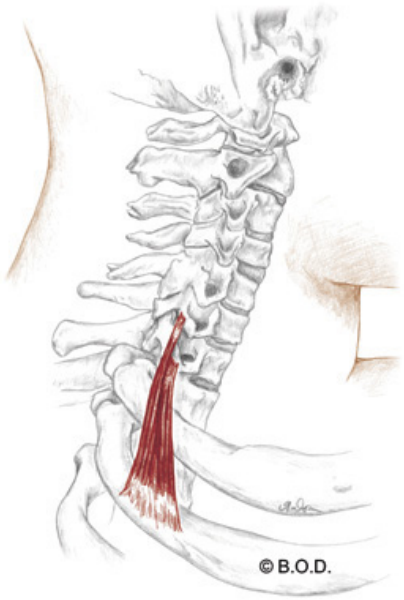
Anterior scalene



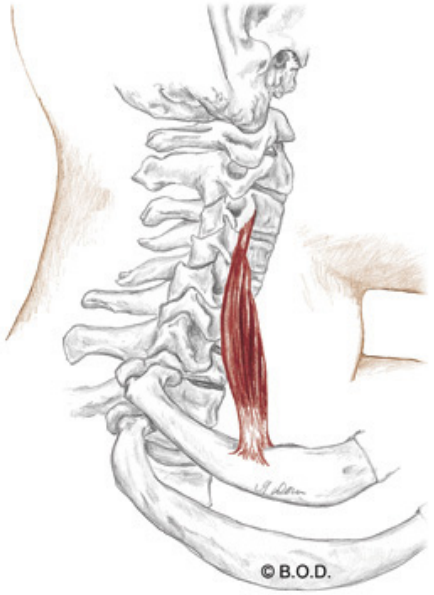

Middle scalene




Posterior scalene



# Anterior Scalenes, page 247



Lateral View

**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:*

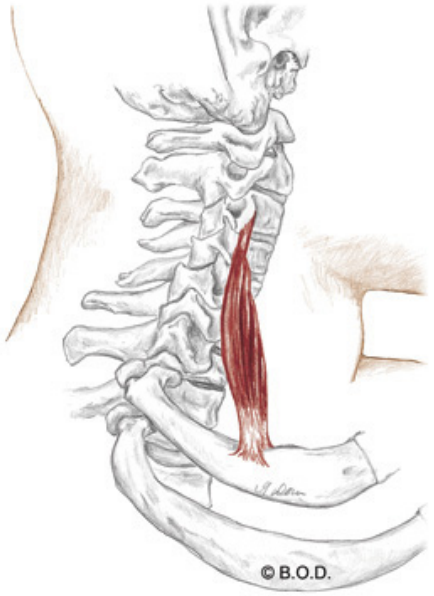
Elevate the ribs during inhalation

Flex the head and neck (anterior only)

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

**I** First rib

# Anterior Scalenes, page 247



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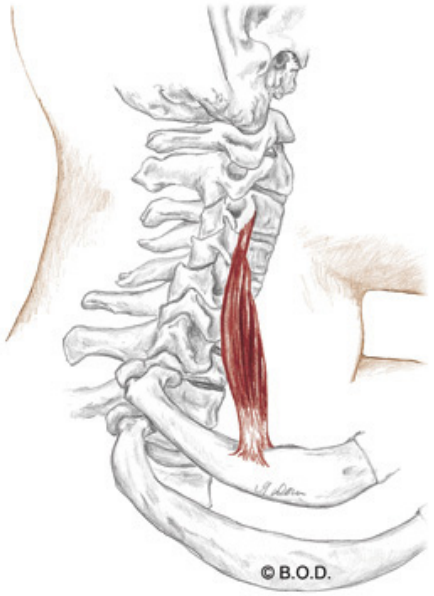

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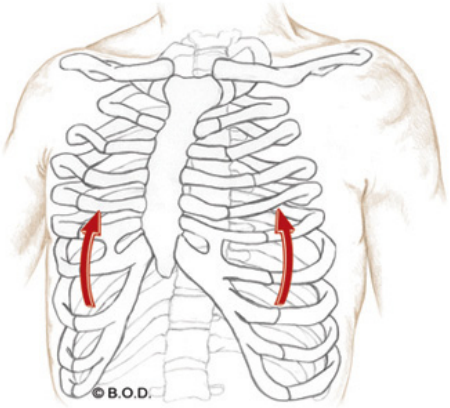

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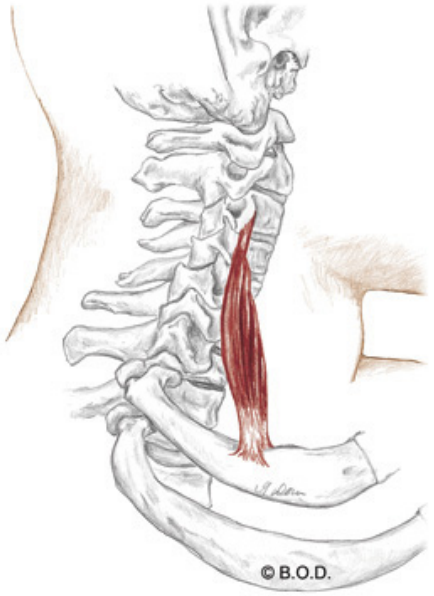

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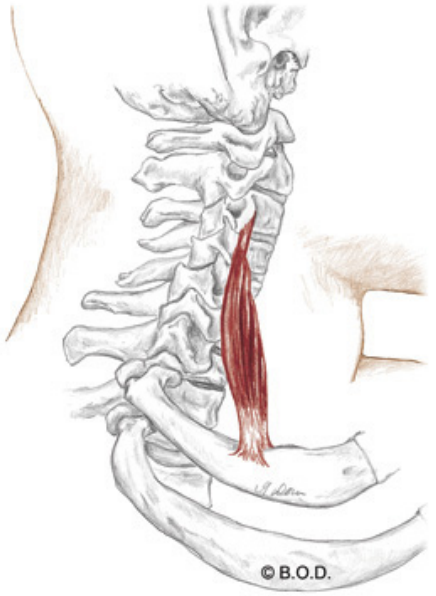
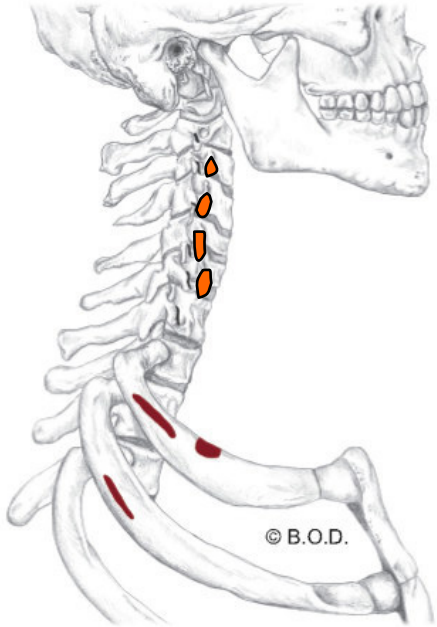



Lateral View



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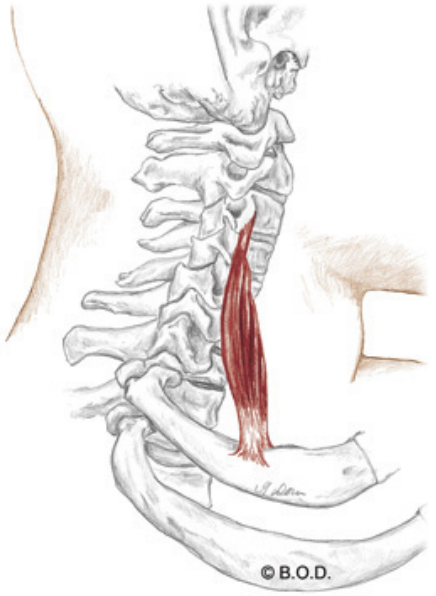


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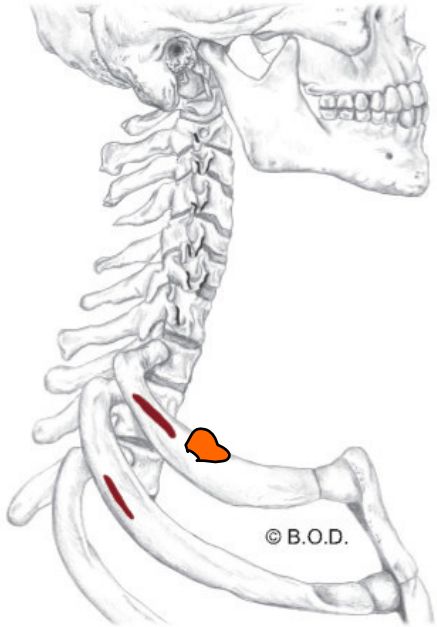
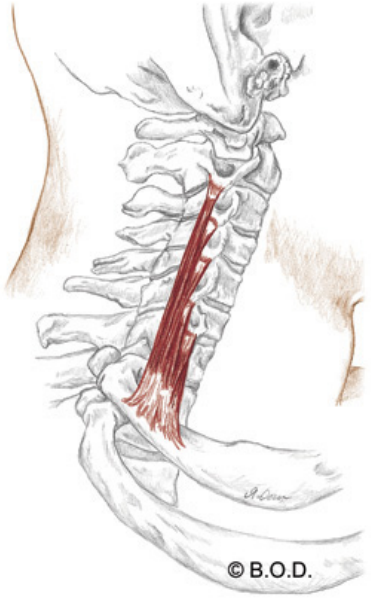


# Middle Scalenes, page 247



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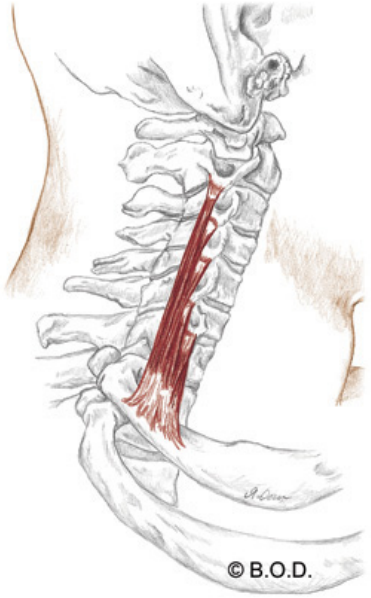

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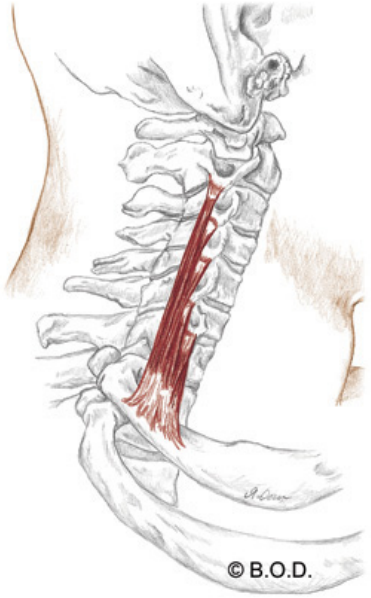

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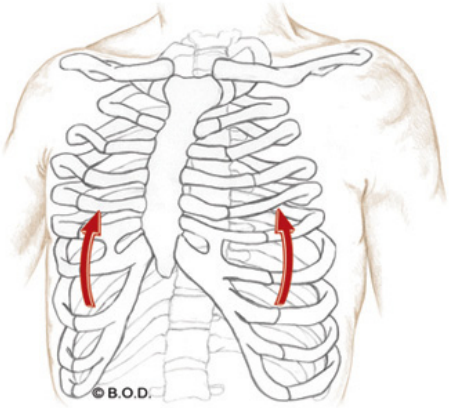

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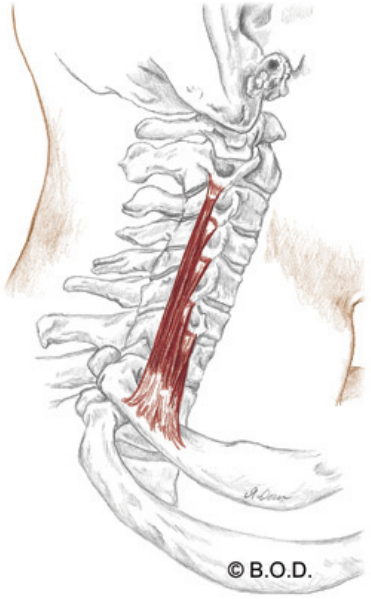


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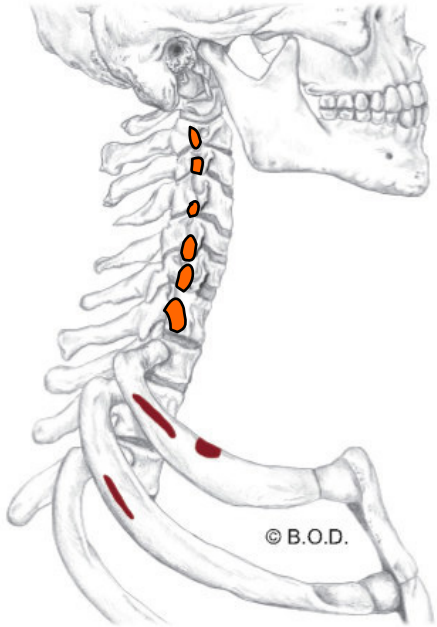

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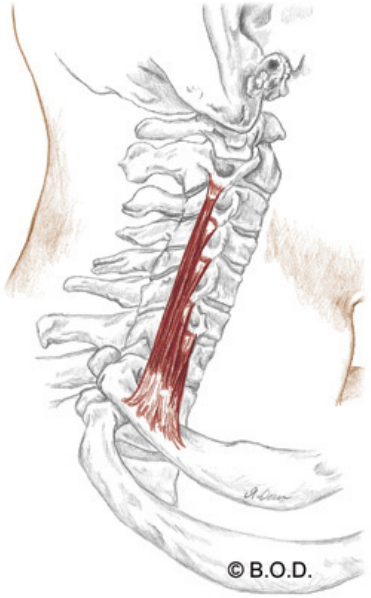


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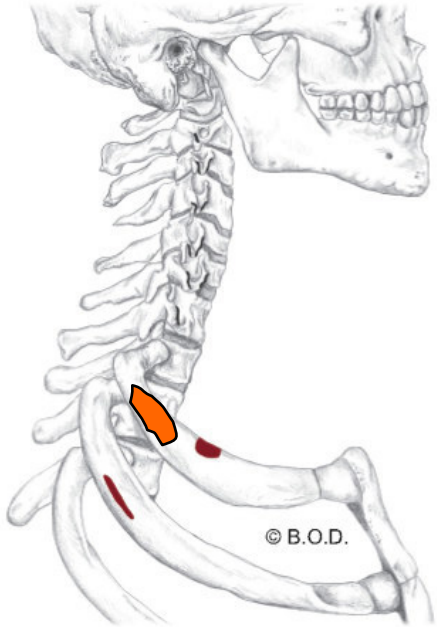
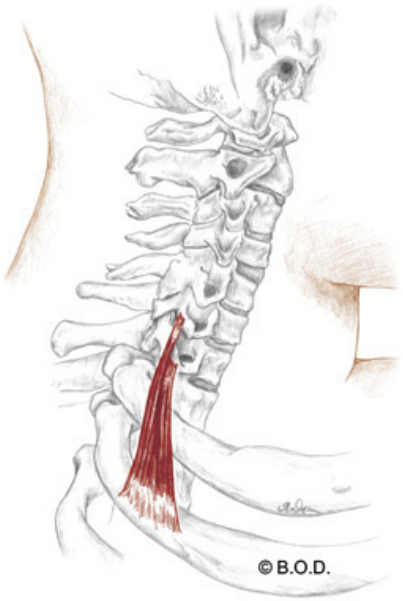


# Posterior Scalenes, page 247



Lateral View

**A** *Unilaterally:*

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Elevate the ribs during inhalation

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

**I** Second rib

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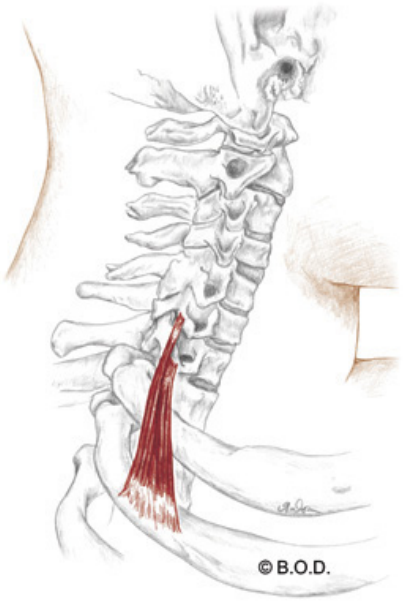

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**I** Second rib

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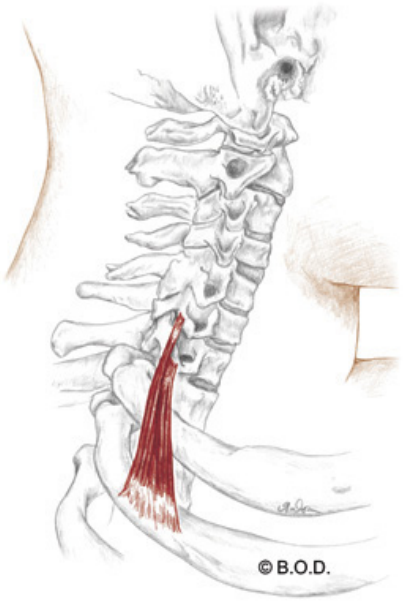

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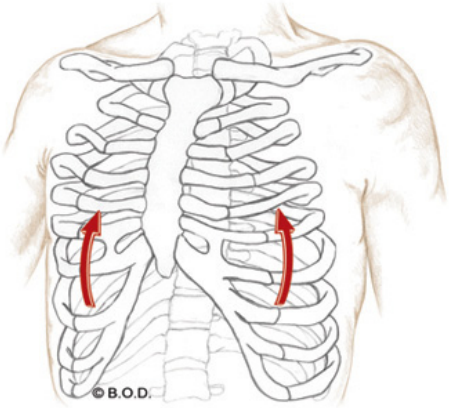

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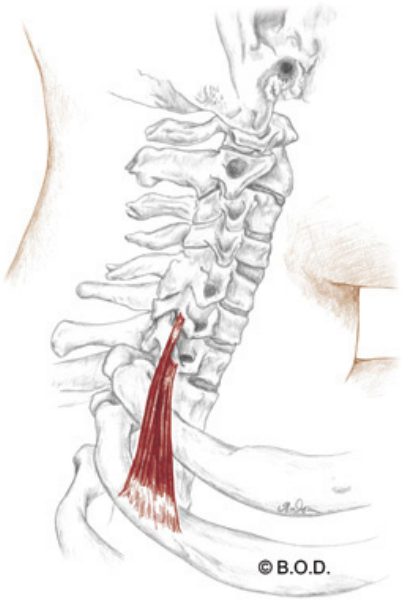


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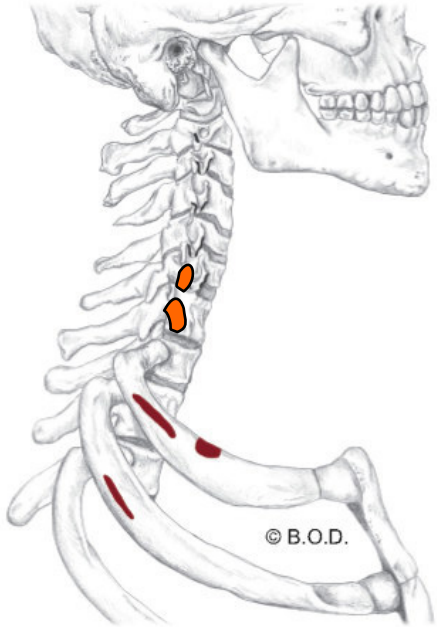

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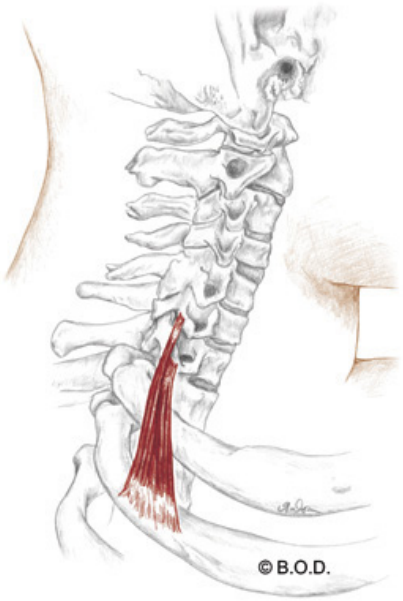
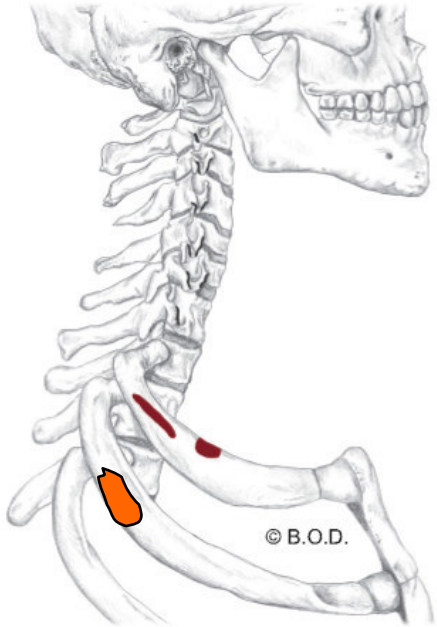


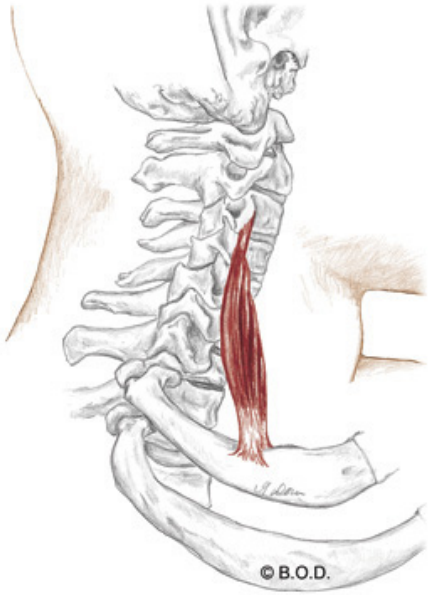

Lateral View

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

**I** Second rib



Anterior scalene

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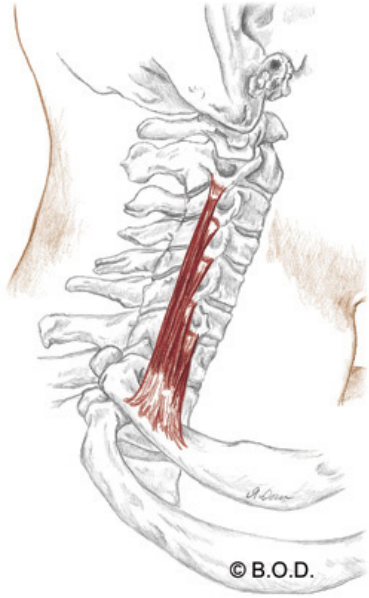


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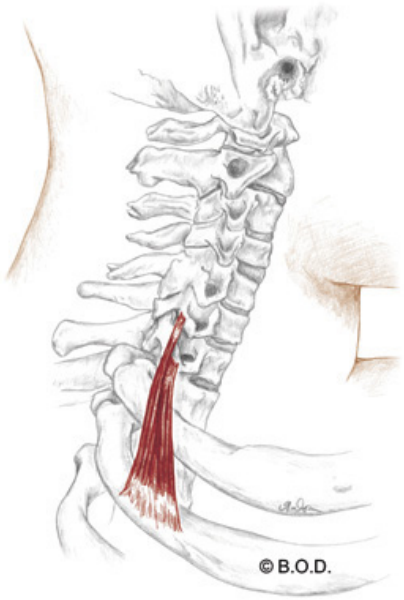


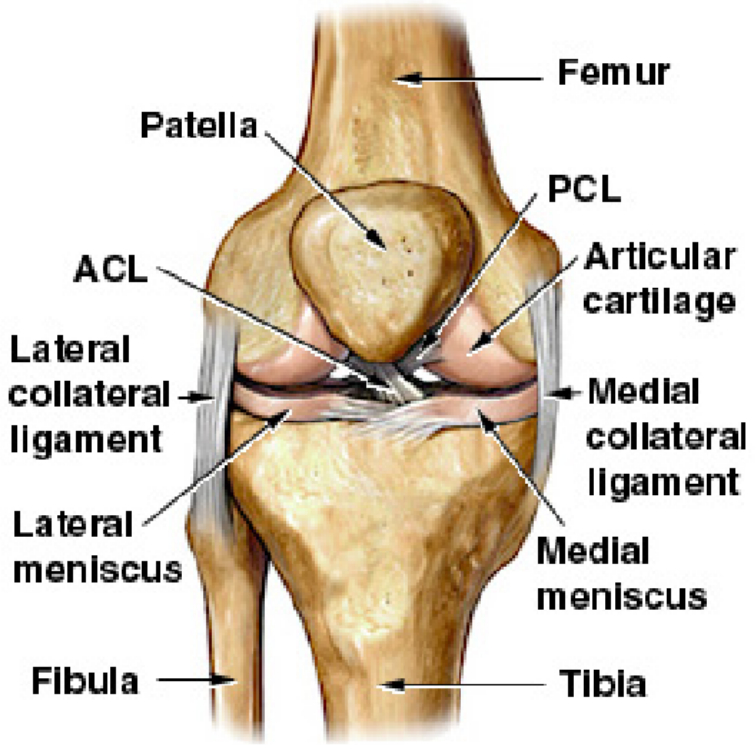
# 16a A&P:

## Skeletal System - Synovial Joints

## E-21

# Joints

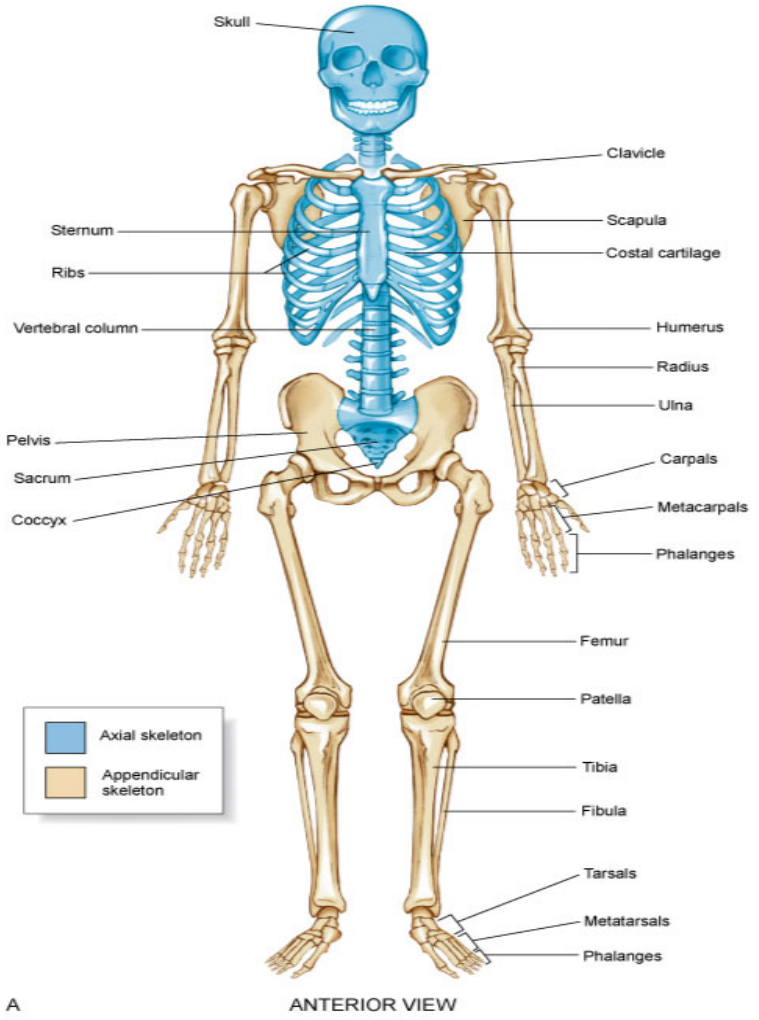
**Joint (AKA: articulation or arthrosis)** Where bones come together or __join__.



# Joints

Physiology

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



# Structural and Functional Classification

Fibrous / Synarthrotic

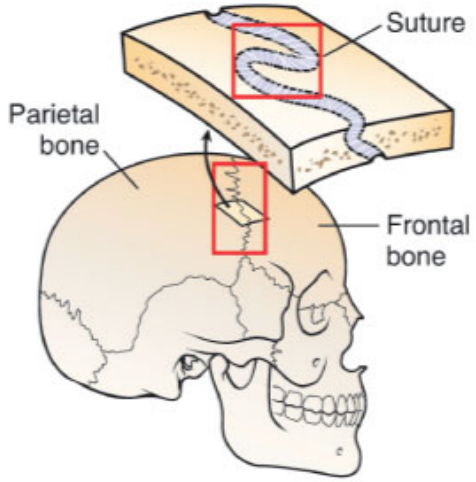
Cartilaginous / Amphiarthrotic

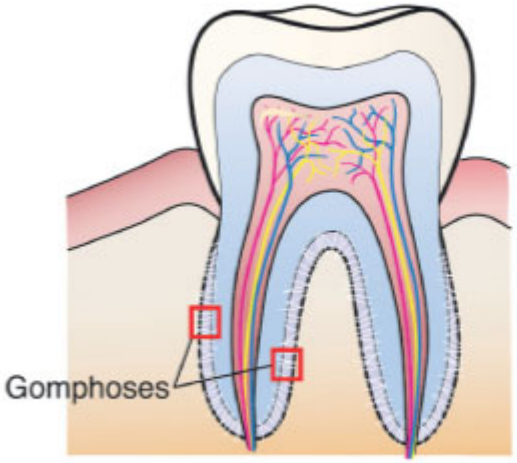
Synovial / Diarthrotic

# 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

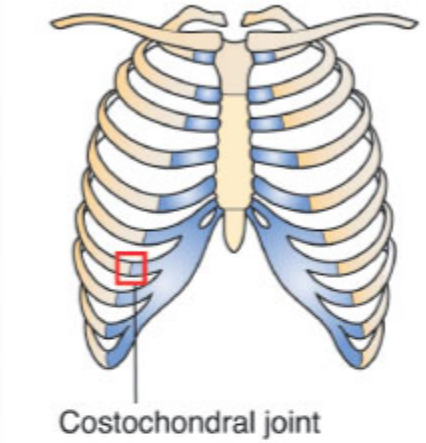


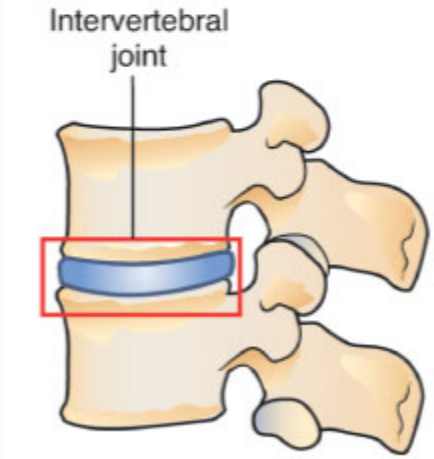



# Structural and Functional Classification

**Cartilaginous / Amphiarthrotic**

- Connected by __cartilage__.
- Slightly __movable__.
- Examples: costochondral joints, pubic symphysis, and intervertebral disk joints

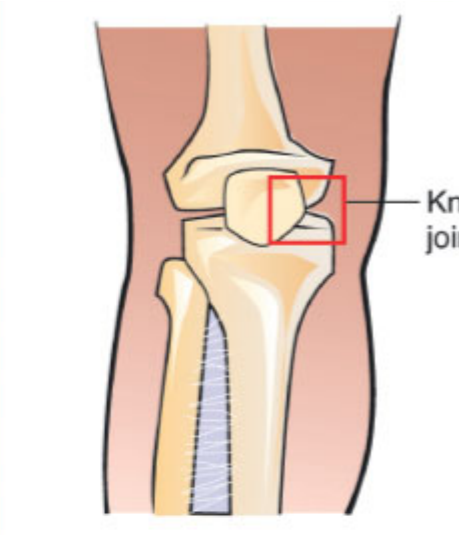


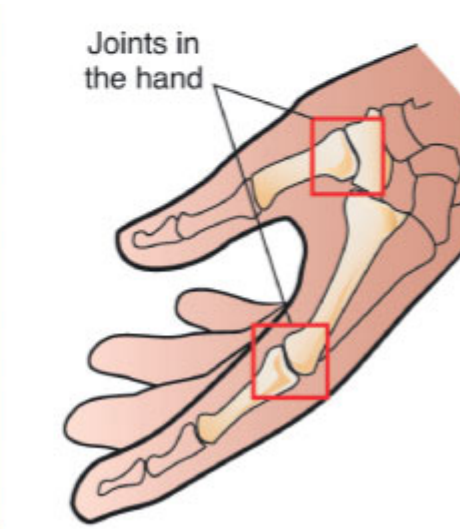



# Structural and Functional Classification

**Synovial / Diarthrotic**

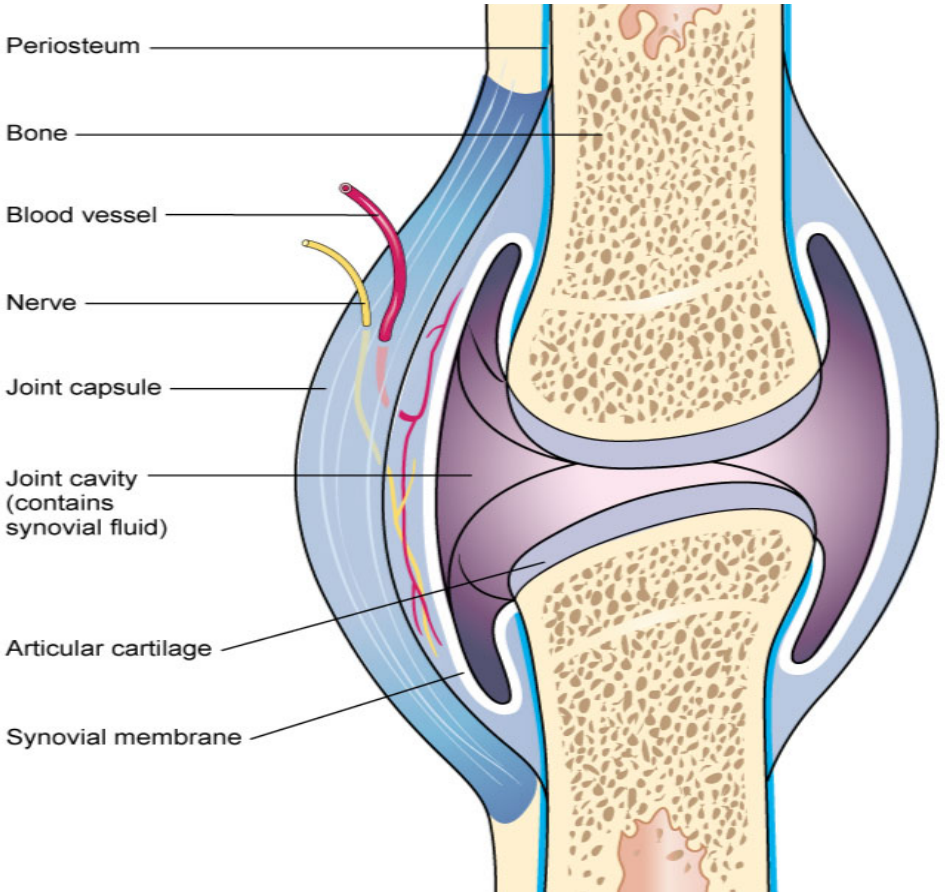
- Contains synovial fluid to nourish and lubricate articulation.
- Freely movable.
- Examples: glenohumeral, iliofemoral . . . see E-26 for more examples





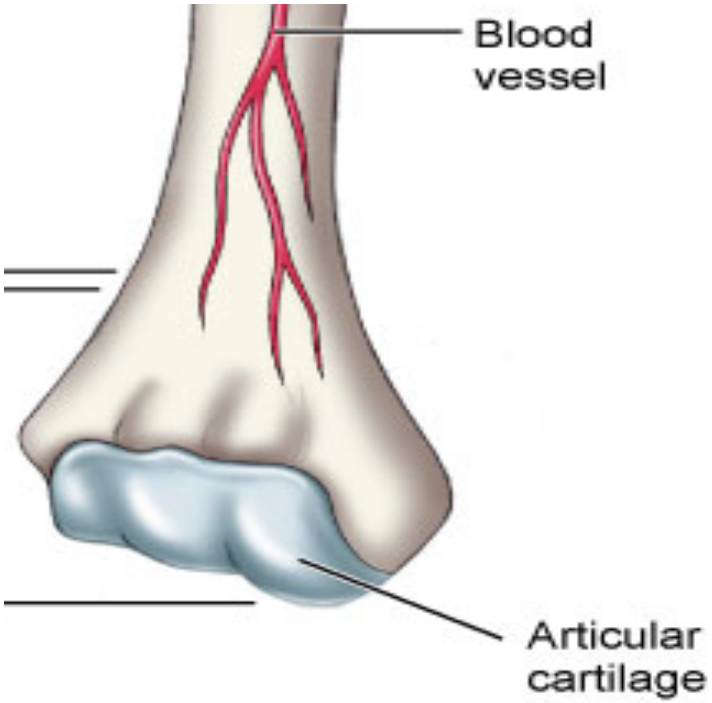
# Synovial Joints

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



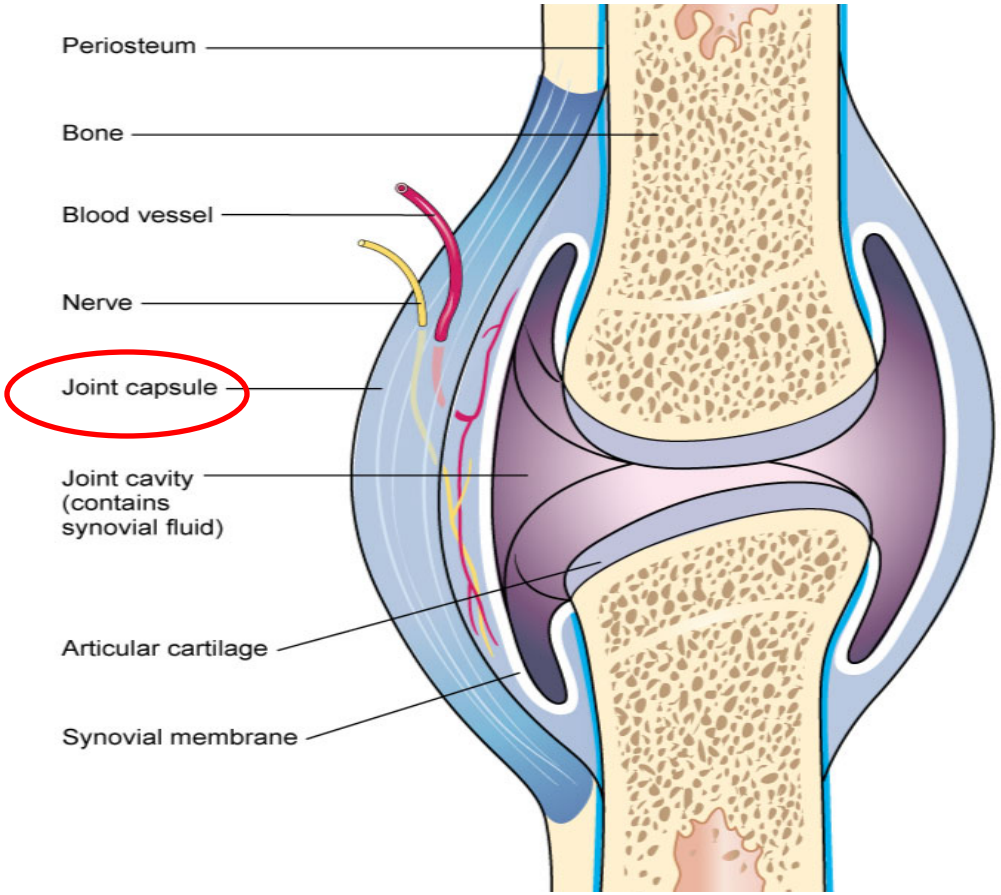
# Synovial Joints

**Articular cartilage** Hyaline cartilage covering an epiphysis.



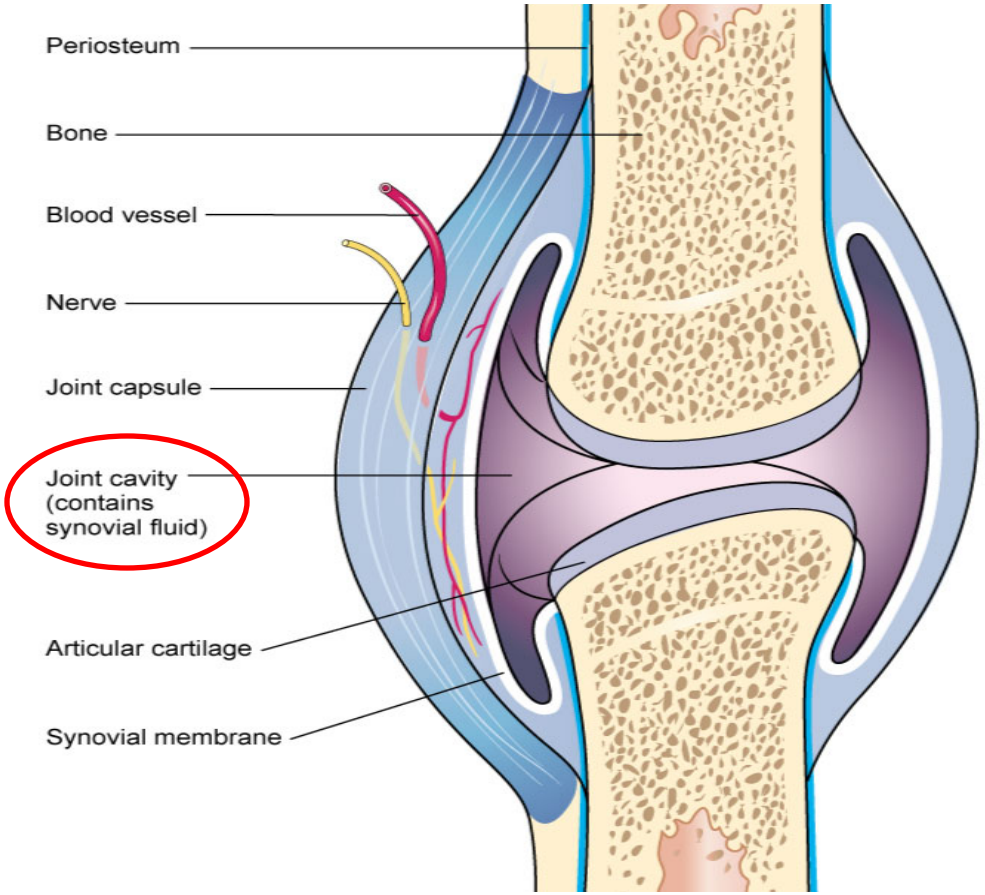
# Synovial Joints

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



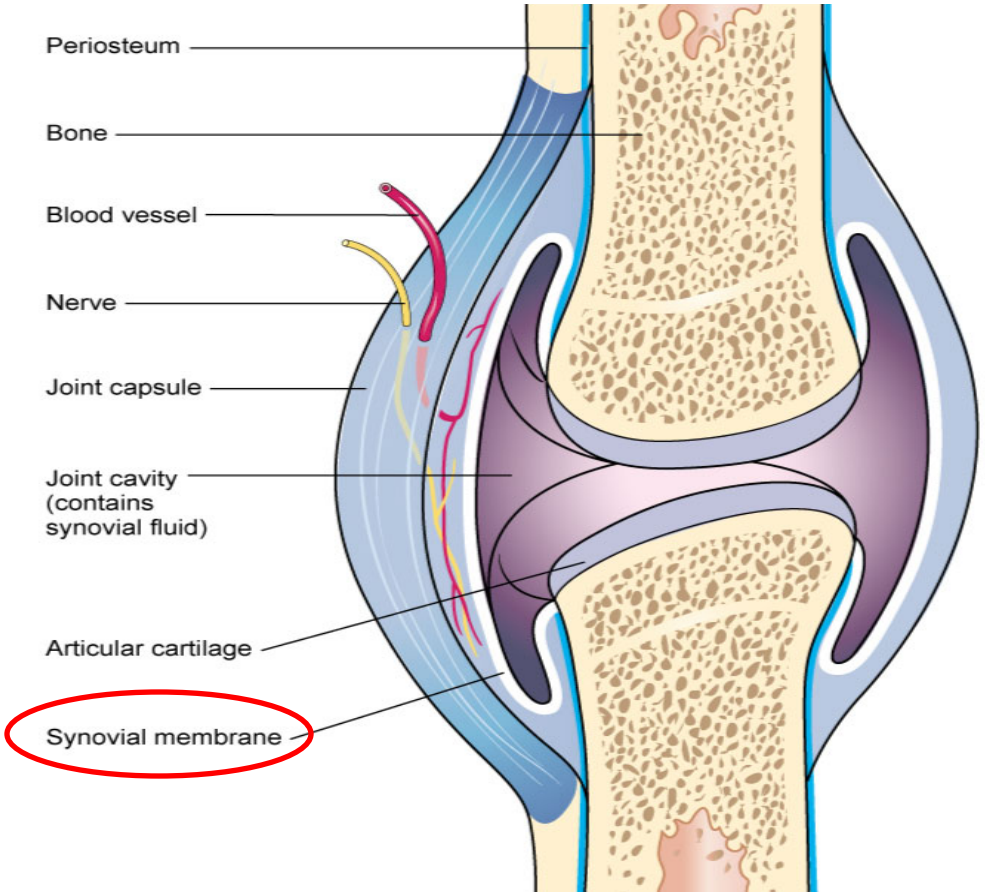
# Synovial Joints

**Joint cavity** Space within a joint capsule. Lined with a __synovial__ membrane.



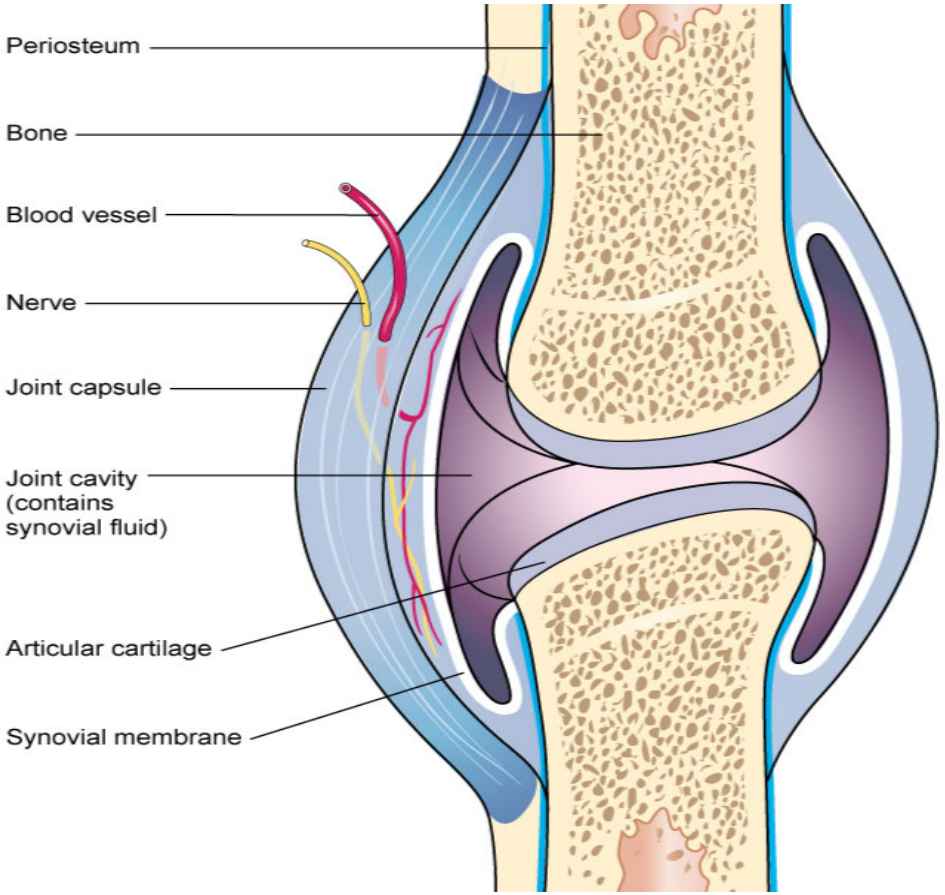
# Synovial Joints

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



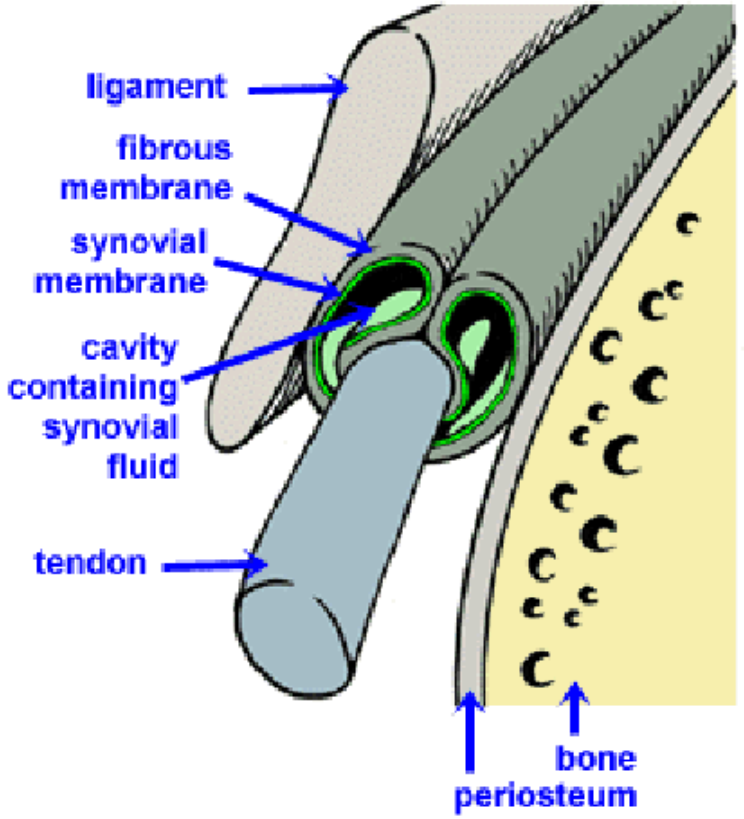
# Synovial Joints

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



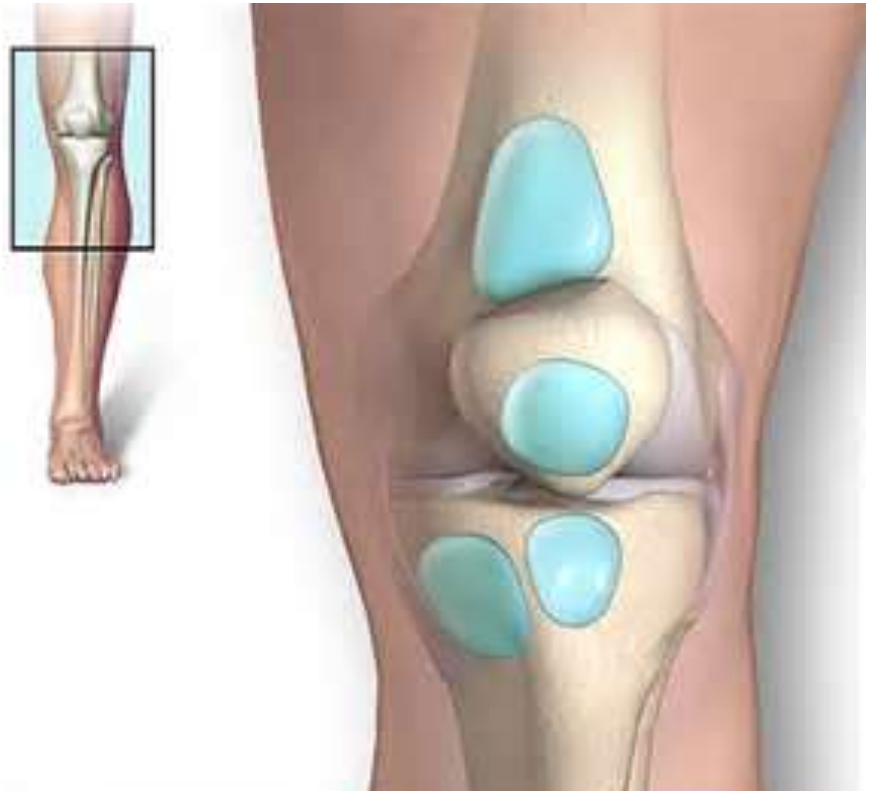
# Synovial Joints

**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.

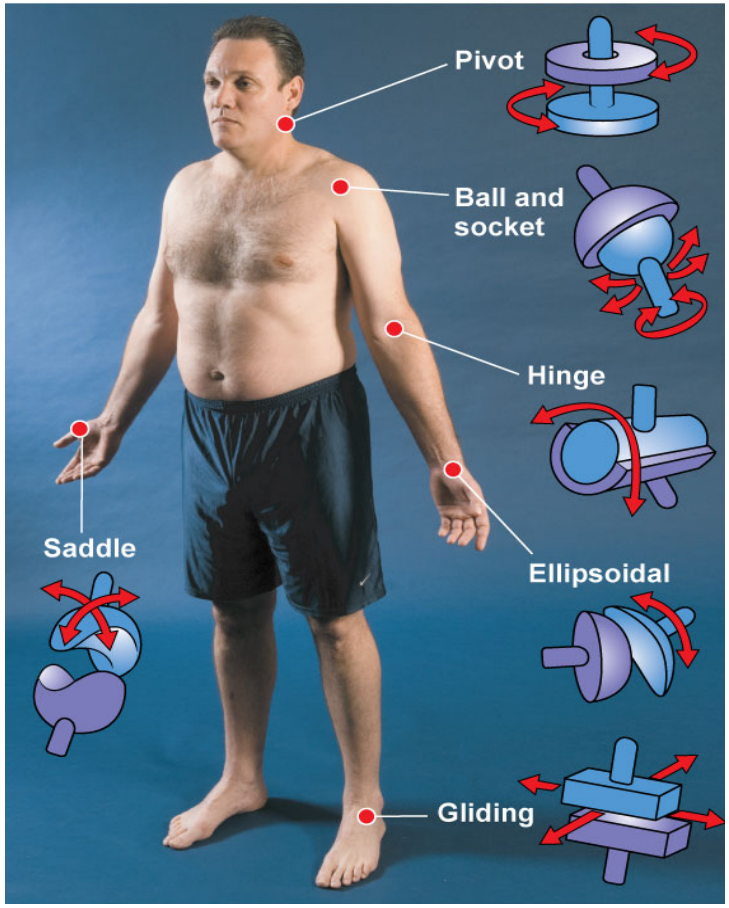


# Synovial Joints

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

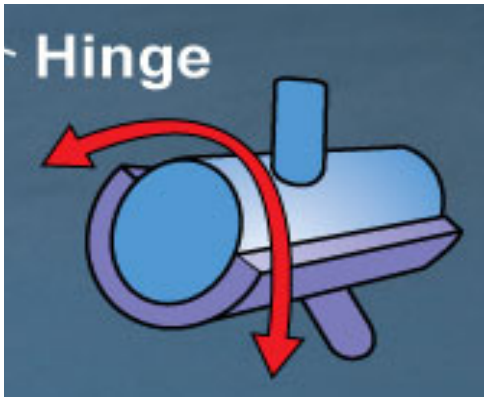
# Types of Synovial Joints

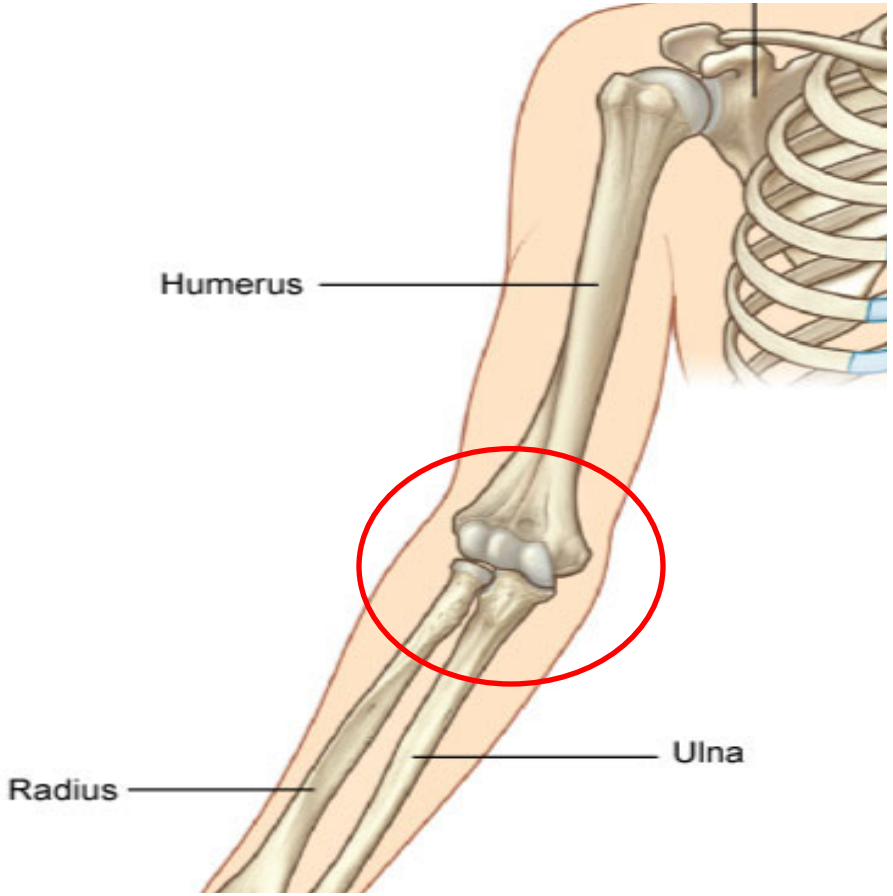
Hinge
Pivot
Ellipsoidal / condyloid
Saddle
Ball and socket
Gliding / planar



# Types of Synovial Joints

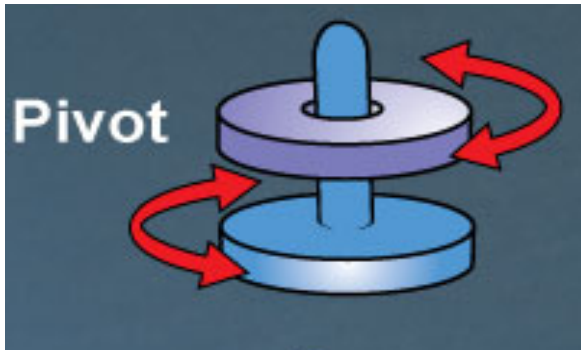
**Hinge** Limited to flexion and __extension__.

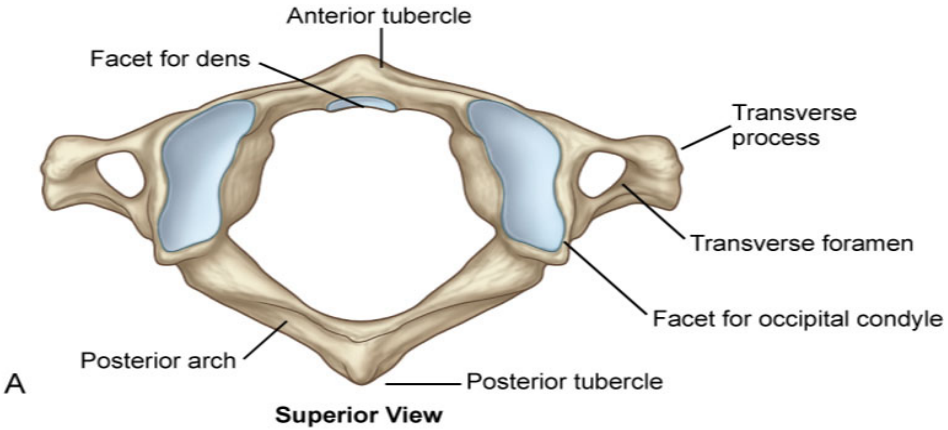


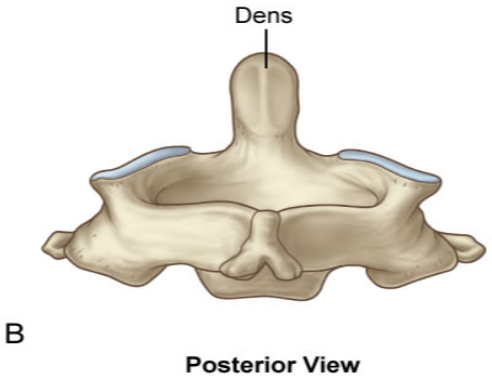



# Types of Synovial Joints

**Pivot** Limited to __rotation__.

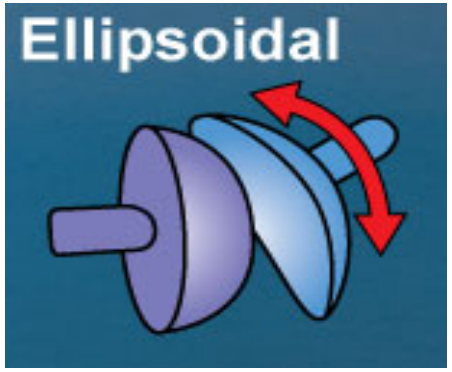


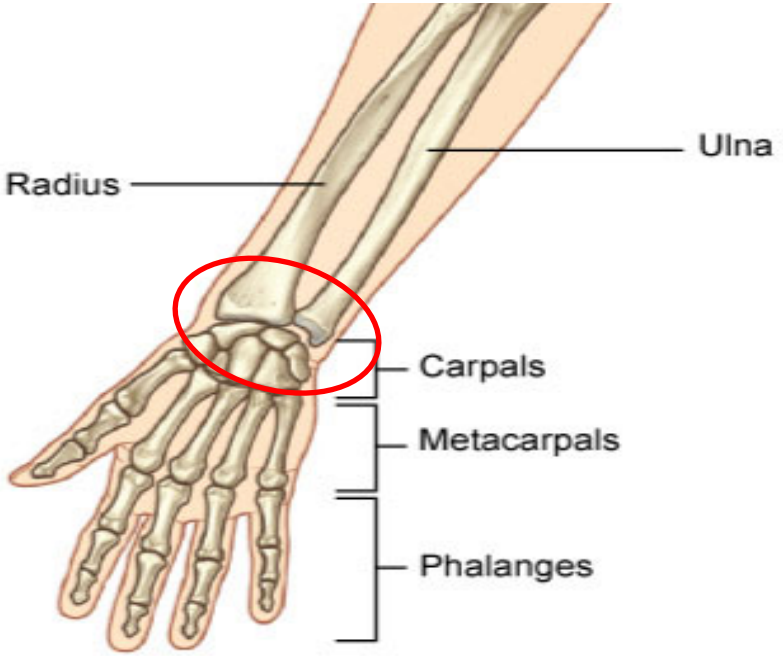



# Types of Synovial Joints

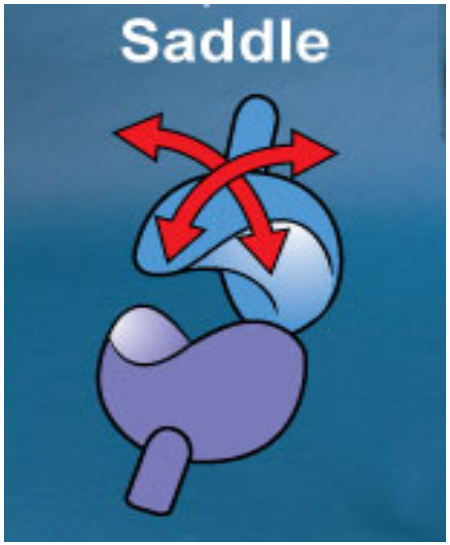
**Ellipsoidal / condyloid** Limited to flexion, extension, abduction, and adduction.

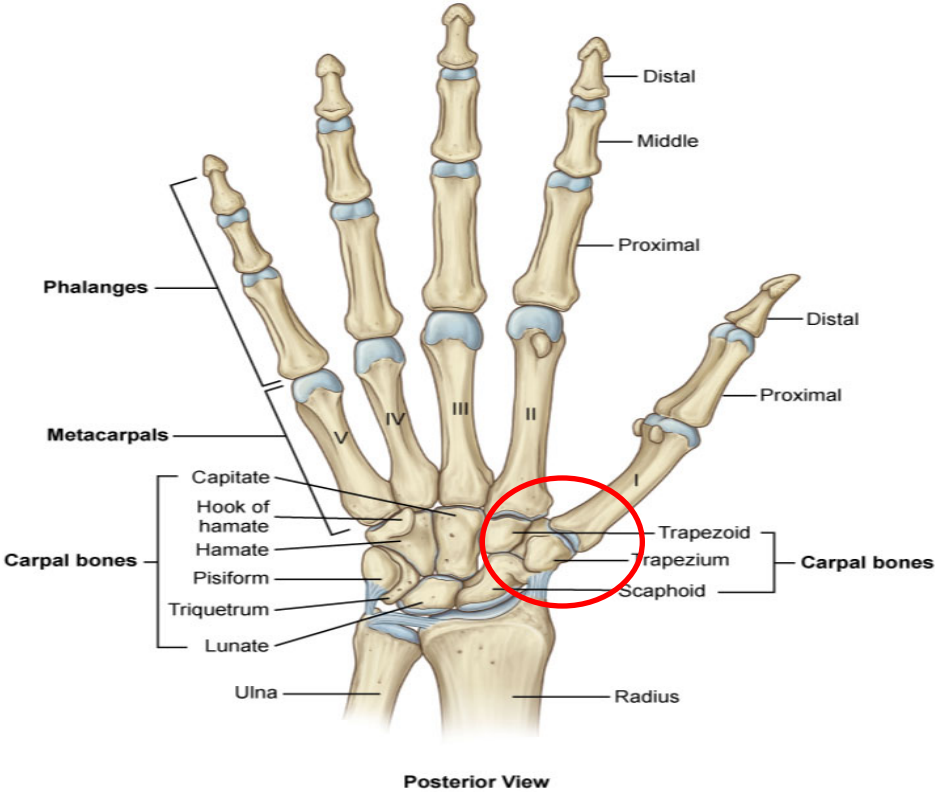


# Types of Synovial Joints

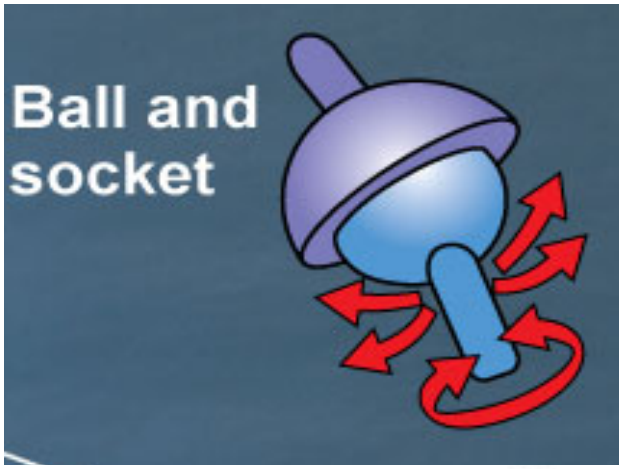
**Saddle** Allowing flexion, extension, abduction, adduction, opposition, reposition, and circumduction, but not rotation.

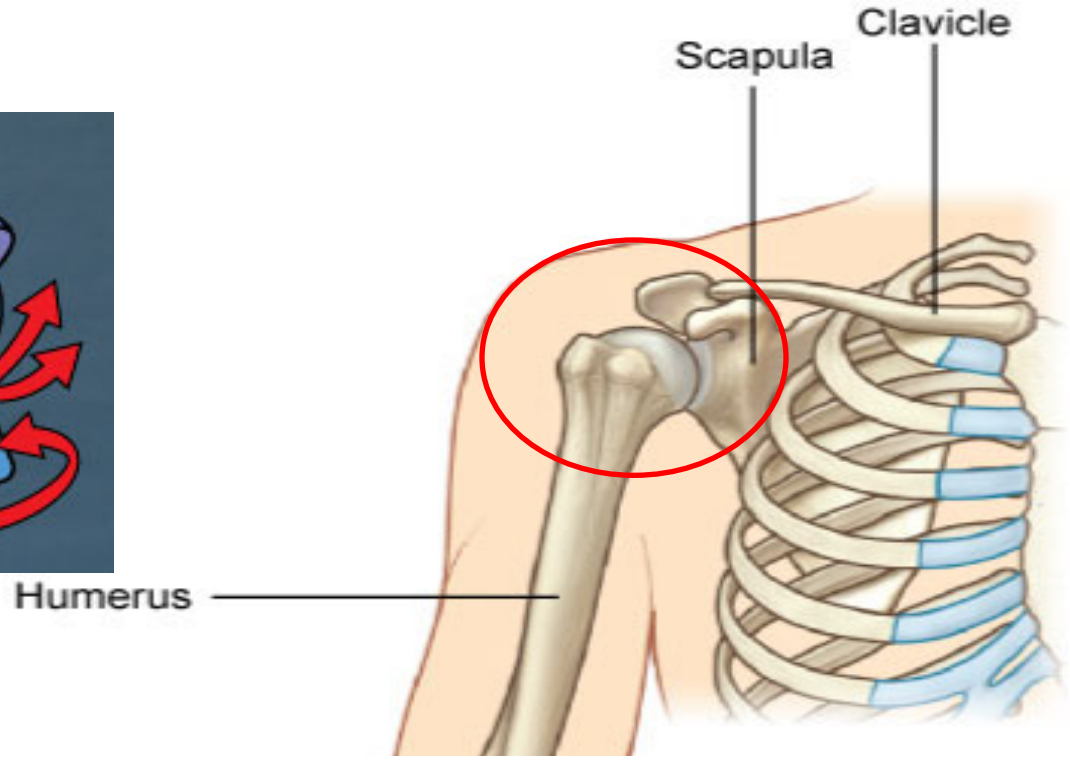


# Types of Synovial Joints

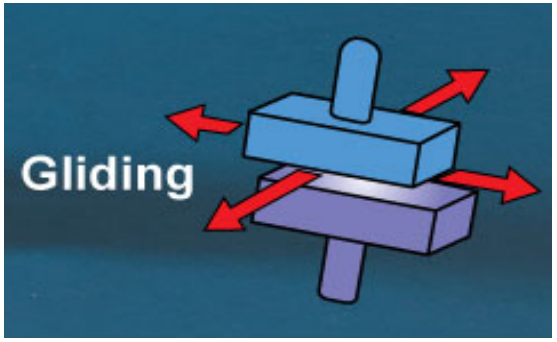
**Ball and socket** Allowing all movements except __gliding__. Offers the greatest range of motion.

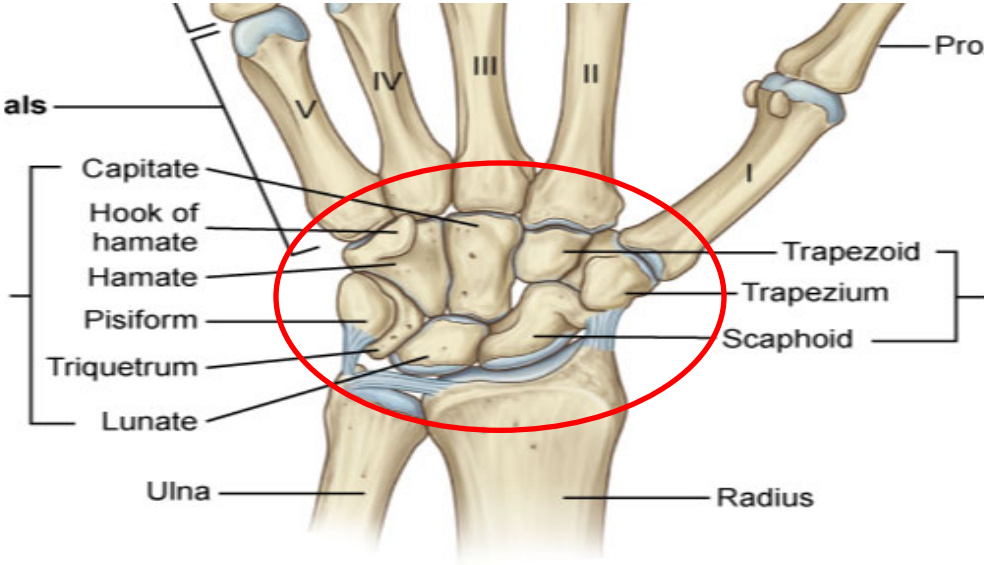


# Types of Synovial Joints

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



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