



Human Anatomy

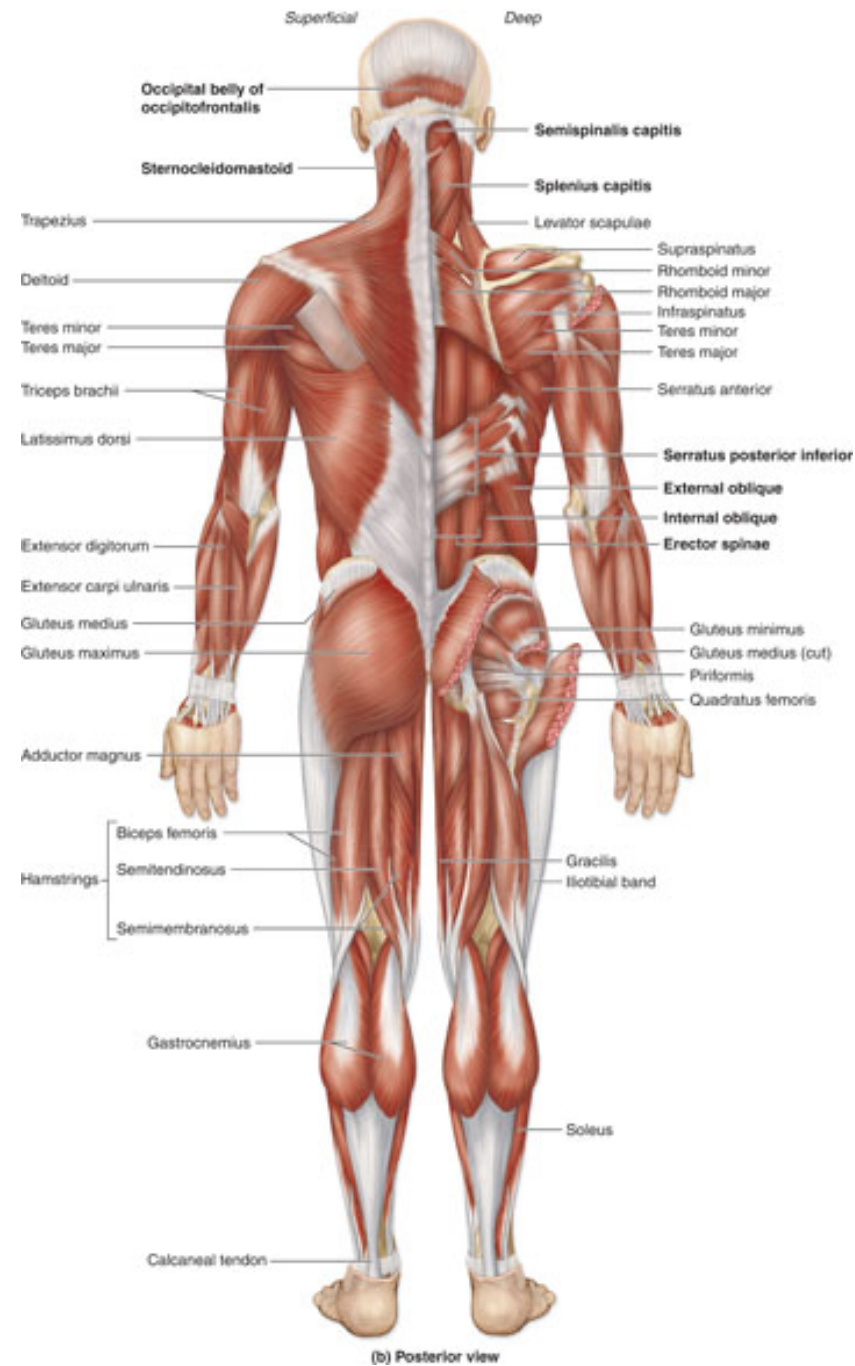
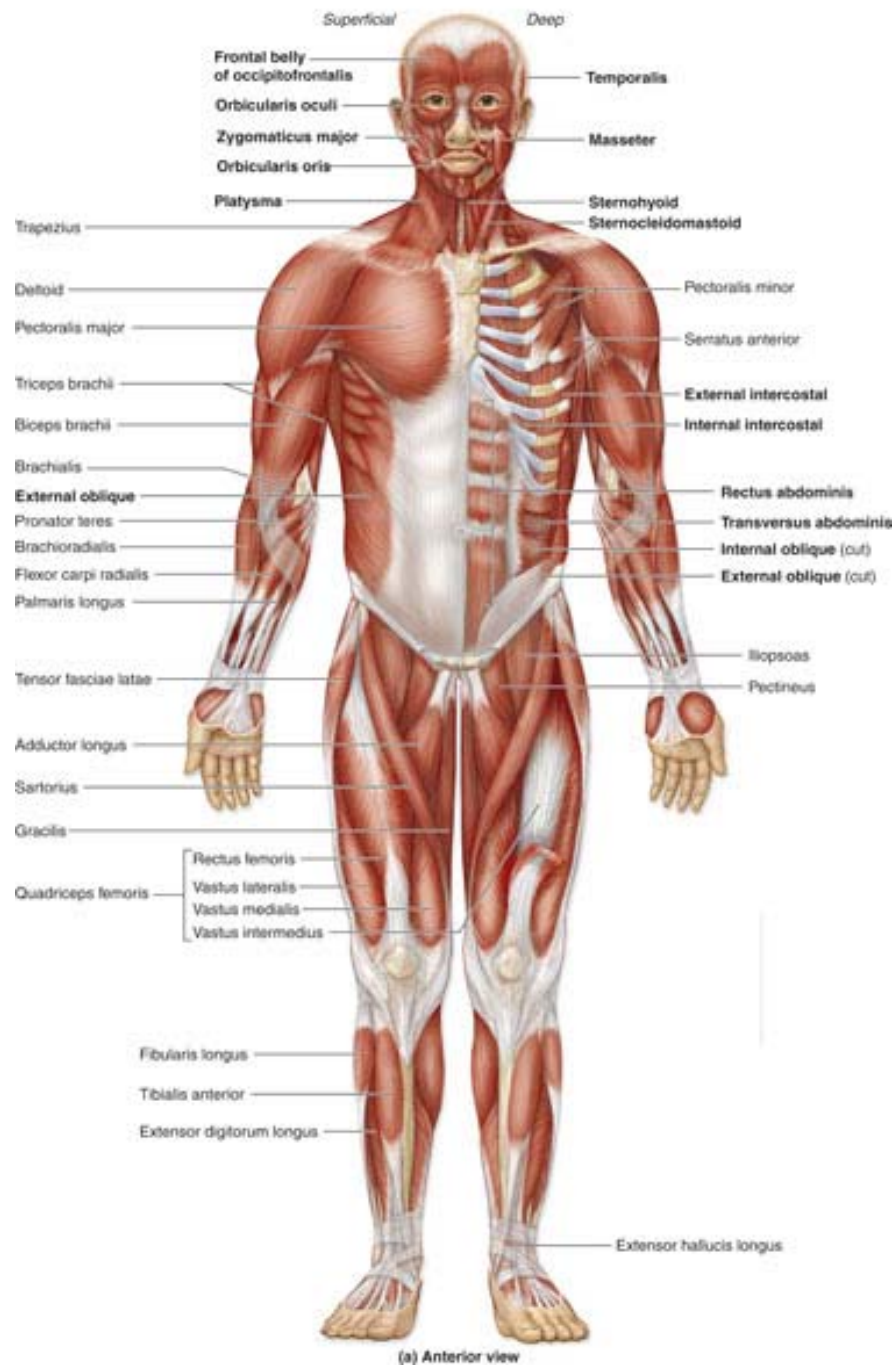
Axial Muscles

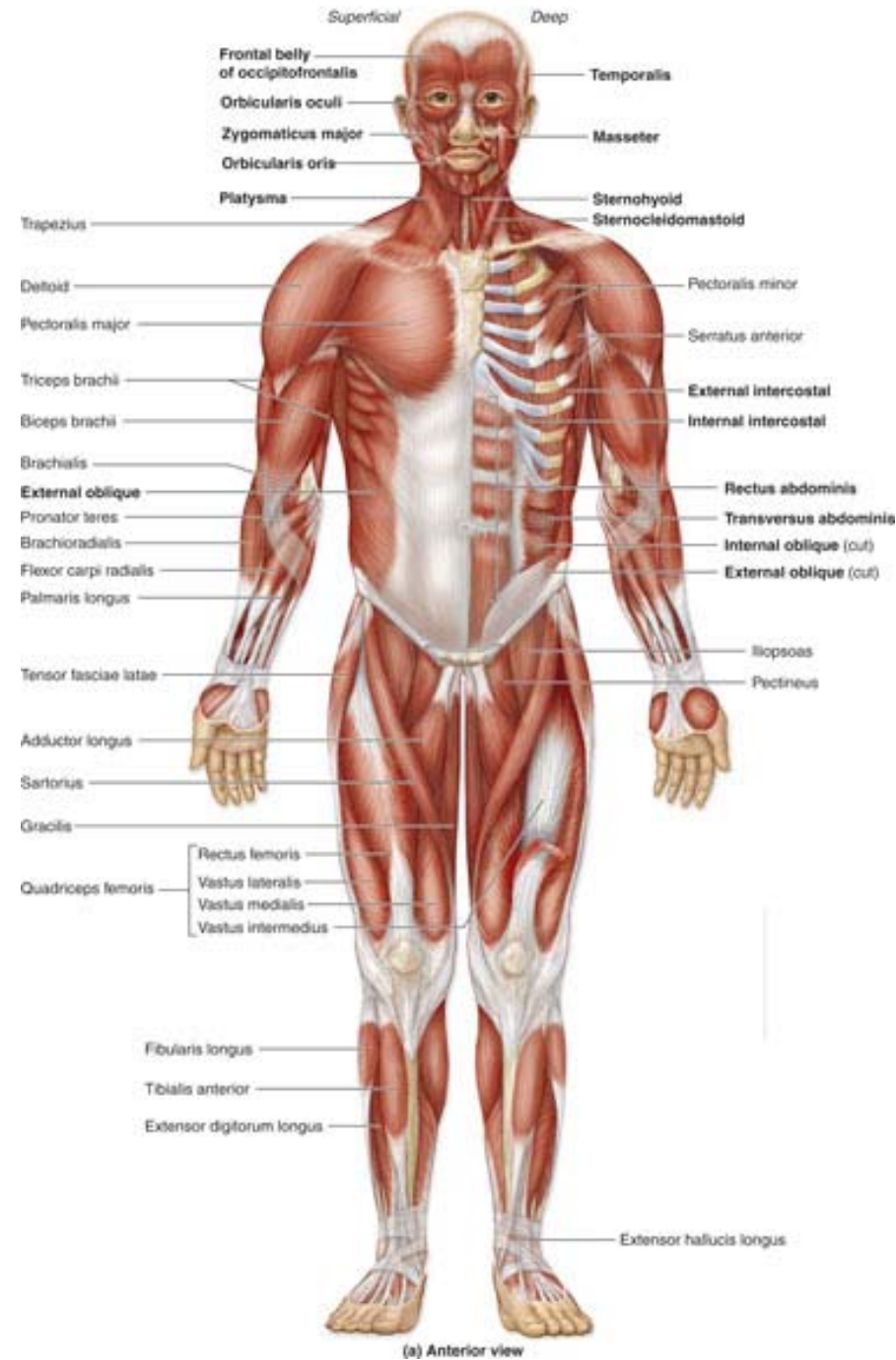
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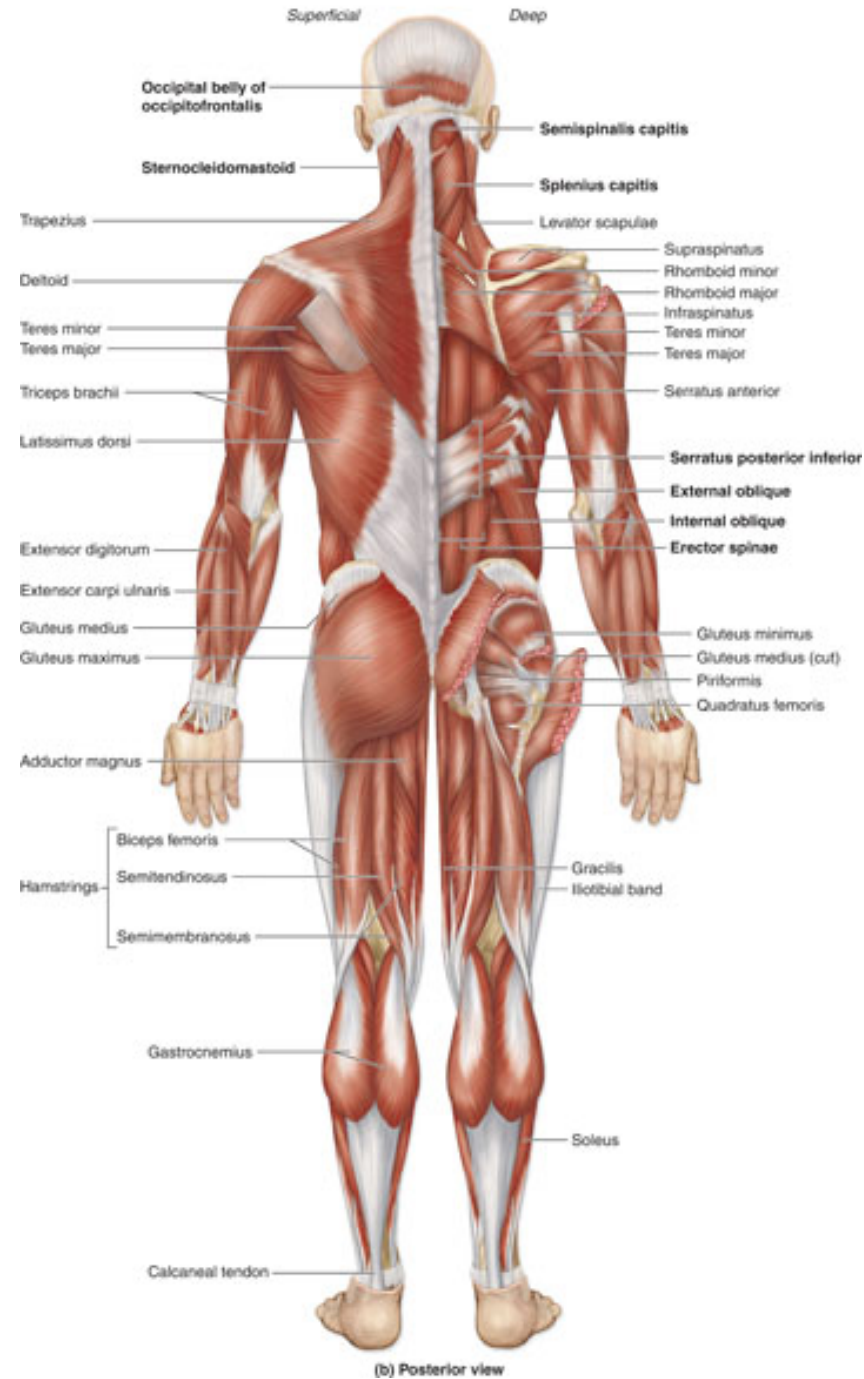


Axial Muscles

- Have both their origins and insertions on parts of the axial skeleton.
- Support and move the head and spinal column.
- Function in **nonverbal communication** by affecting facial features.
- Move the lower jaw during **chewing**.
- Assist in food processing and **swallowing**.
- Aid **breathing**.
- Support and protect the abdominal and pelvic organs.
- Are **not** responsible for stabilizing or moving the pectoral or pelvic girdles or their attached limbs.









Muscles of the Head and Neck

- Separated into several specific groups.
- Almost all originate on either the **skull** or the **hyoid bone**.

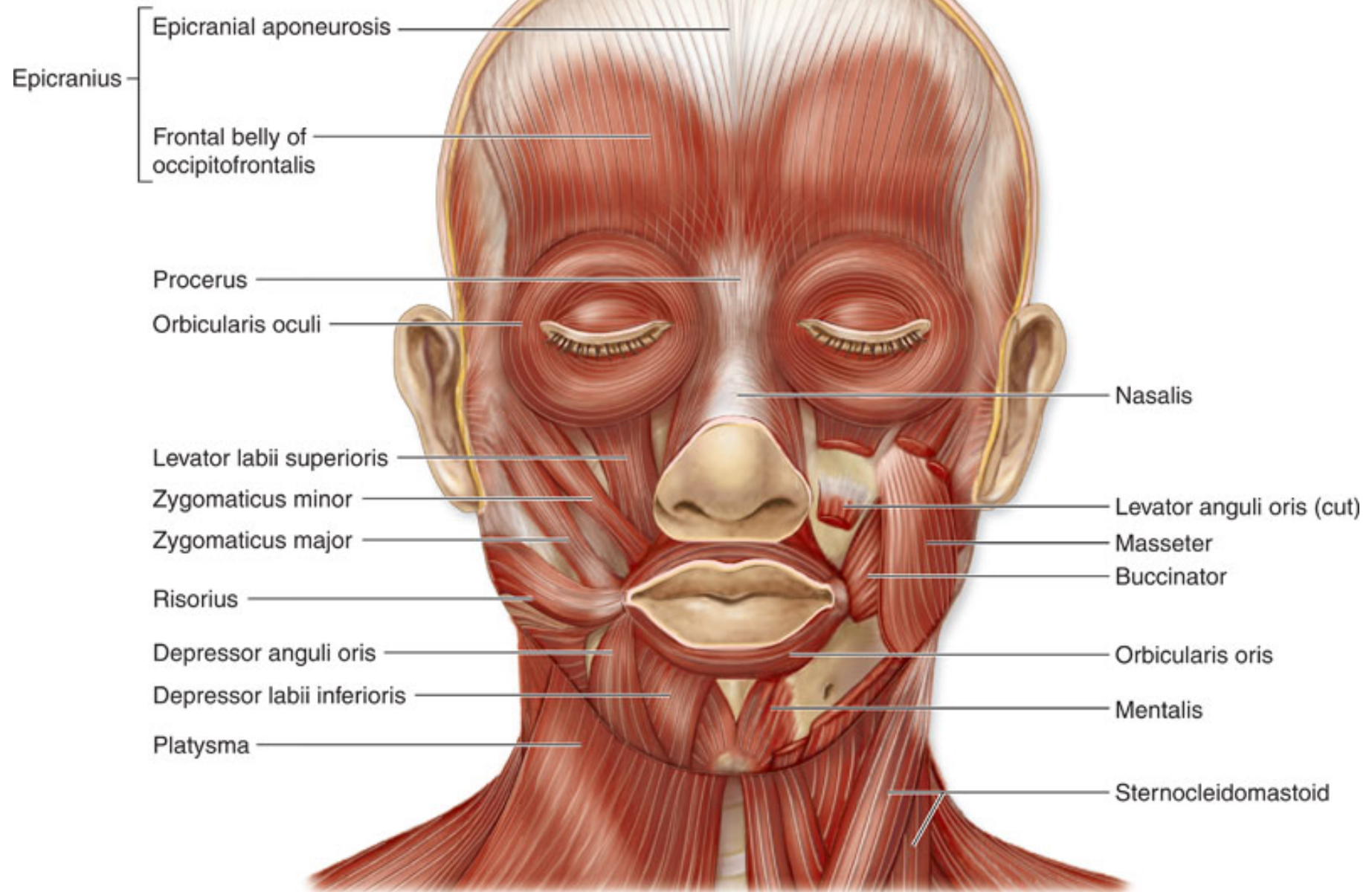


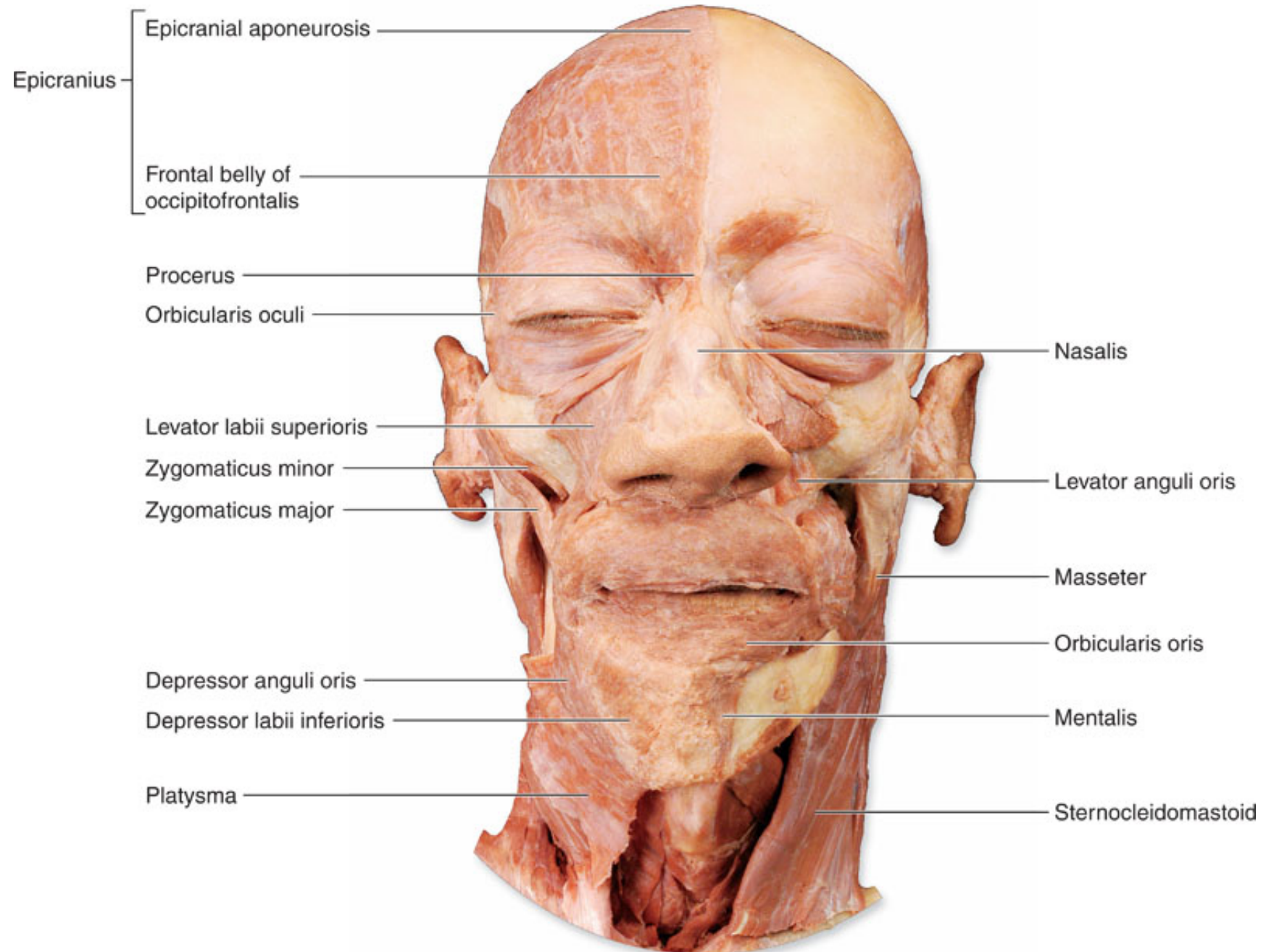
Muscles of Facial Expression

- Originate in the superficial fascia or on the skull bones.
- Insert into the superficial fascia of the skin.
- Contort the skin causing it to move.

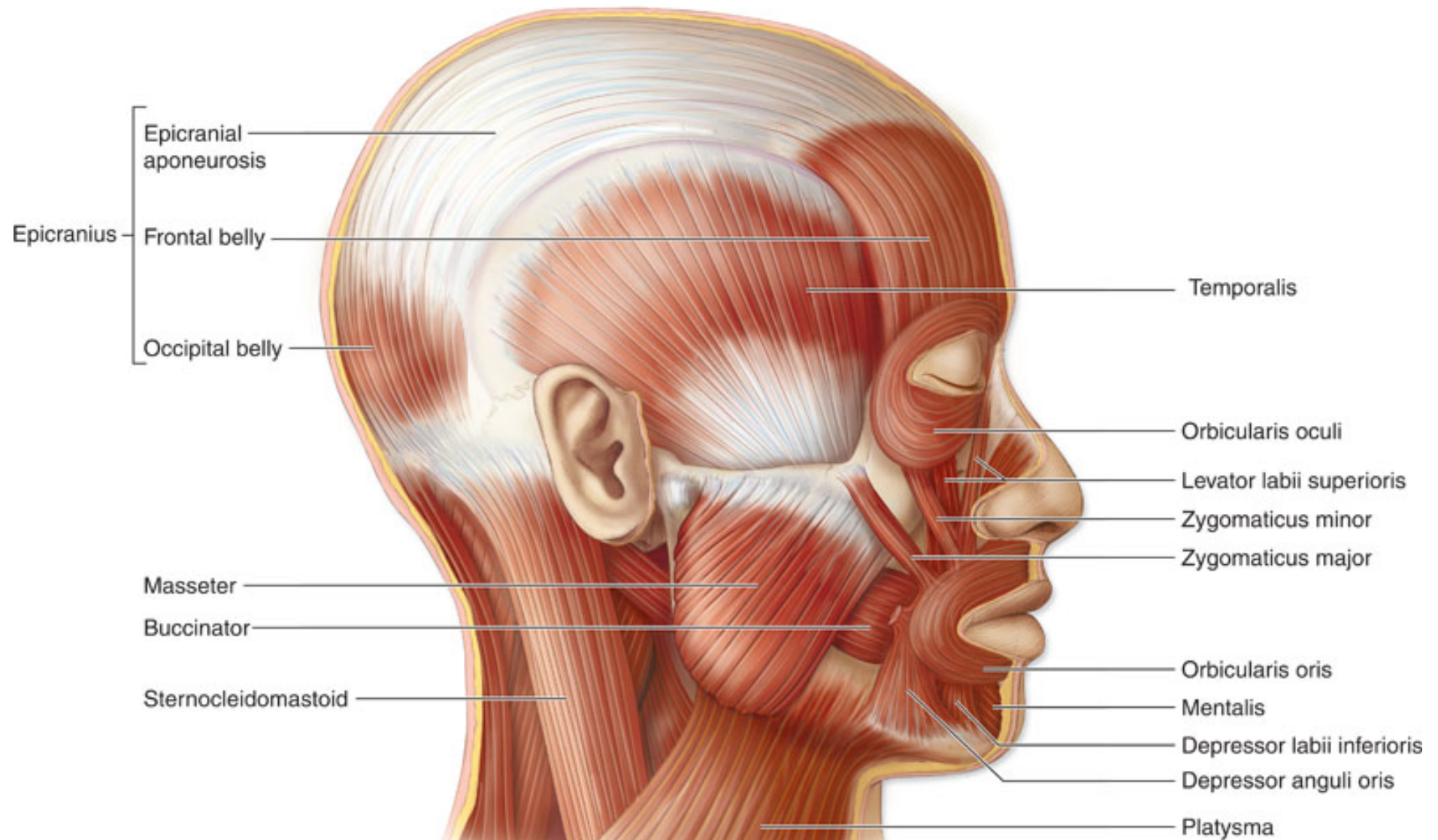
Superficial

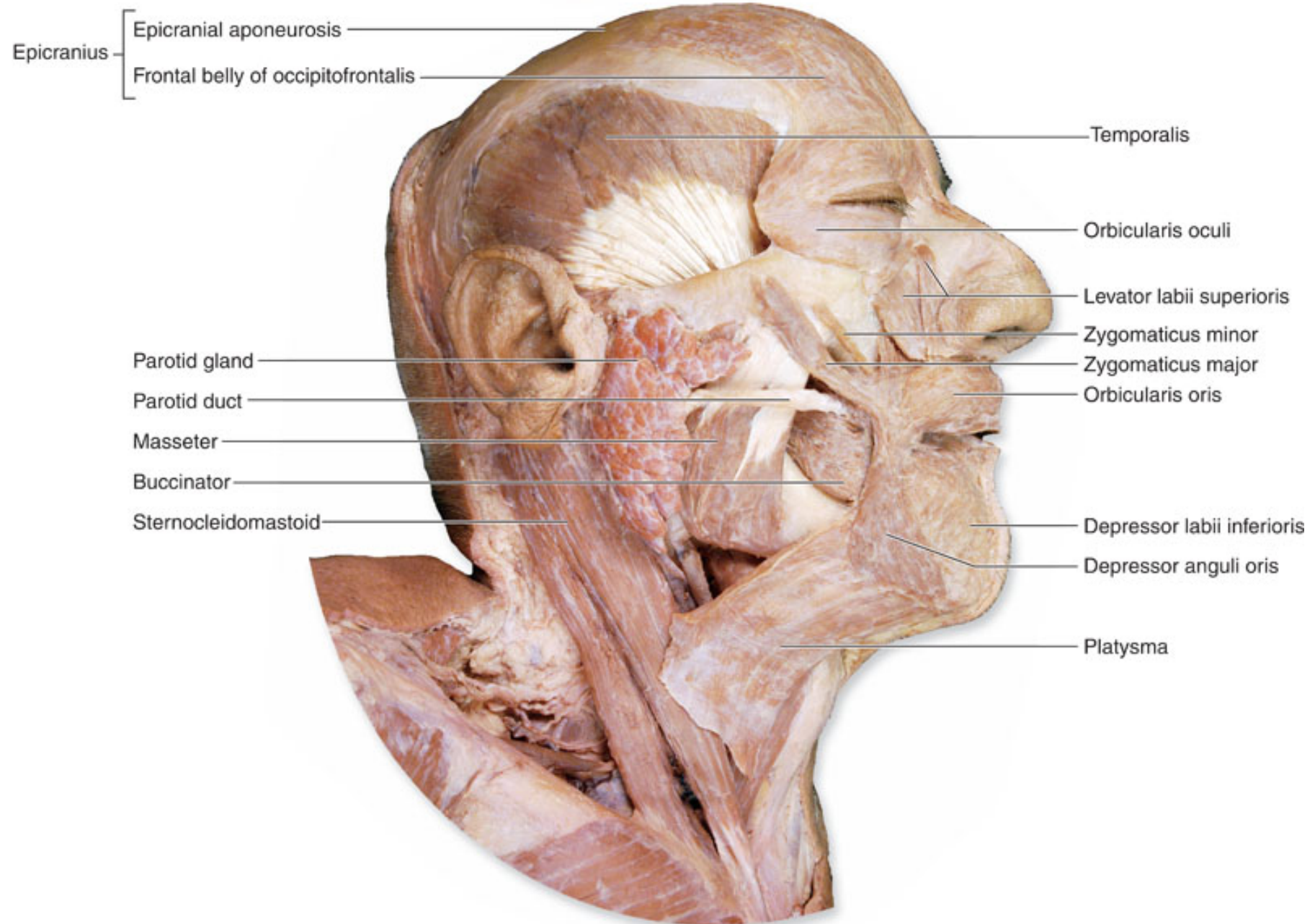
Deep





(a) Anterior view





(b) Lateral view



Muscles of Facial Expression

- Several are associated with the nose.
- The mouth is the most expressive part of the face
 - muscles in that area are very diverse
- Orbicularis oris consists of muscle fibers that encircle the opening of the mouth.
 - when it contracts the mouth closes



Depressor anguli oris
(frown)



Orbicularis oculi
(blink/close eyes)

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Zygomaticus major
(smile)



Orbicularis oris
(close mouth/kiss)



Frontal belly of occipitofrontalis
(wrinkle forehead, raise eyebrows)

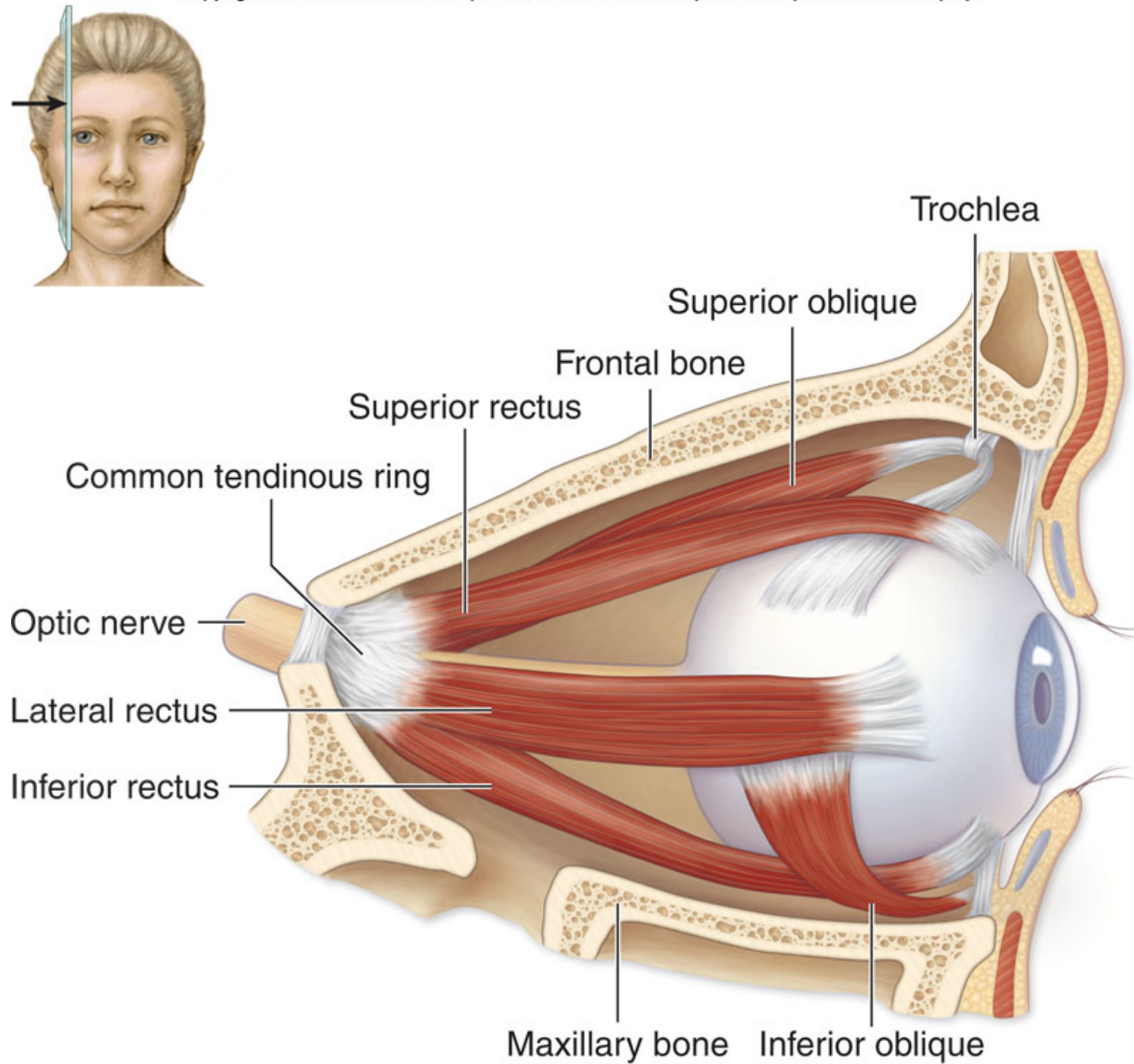


Platysma
(tense skin of neck)

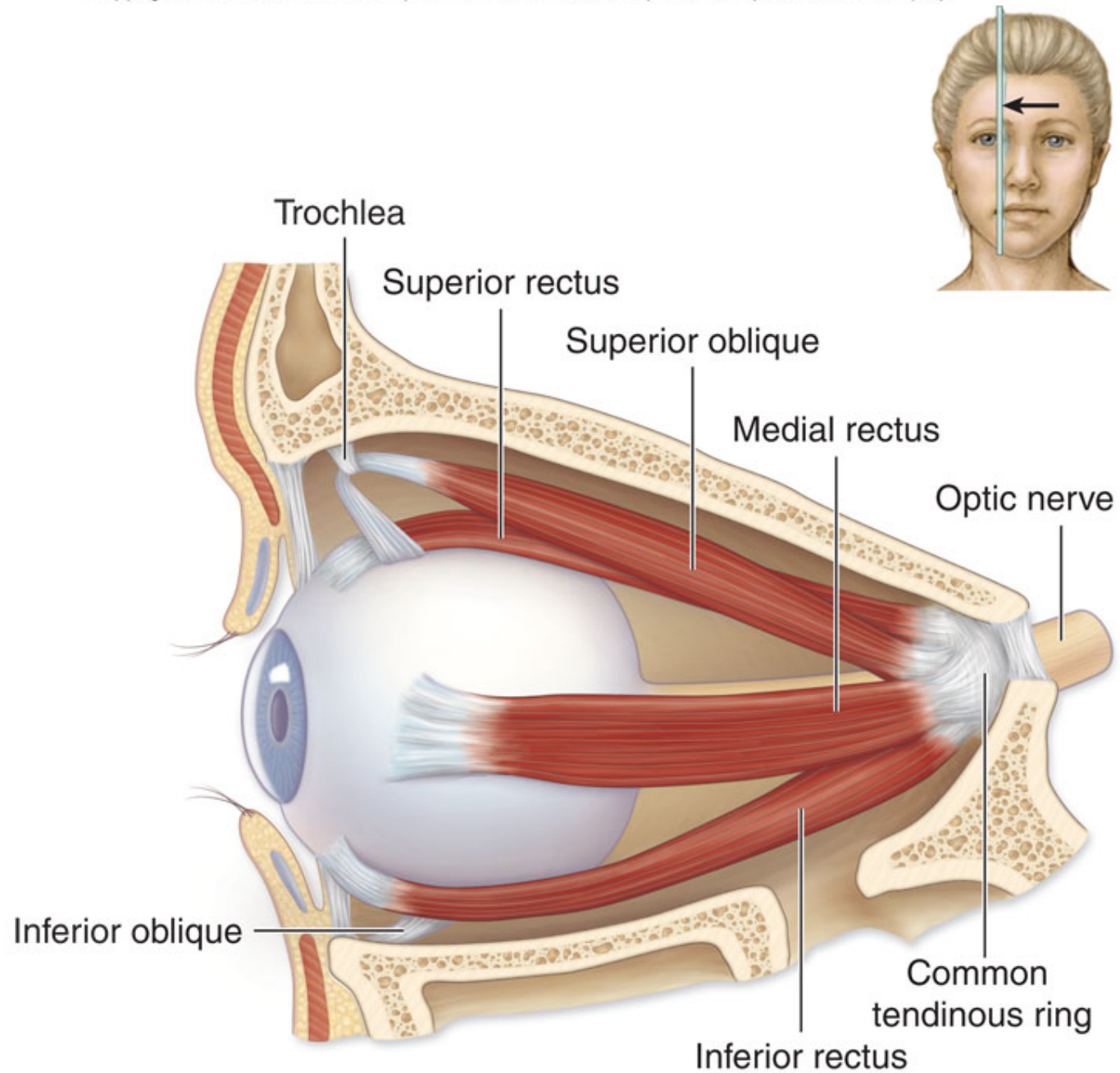


Extrinsic Eye Muscles

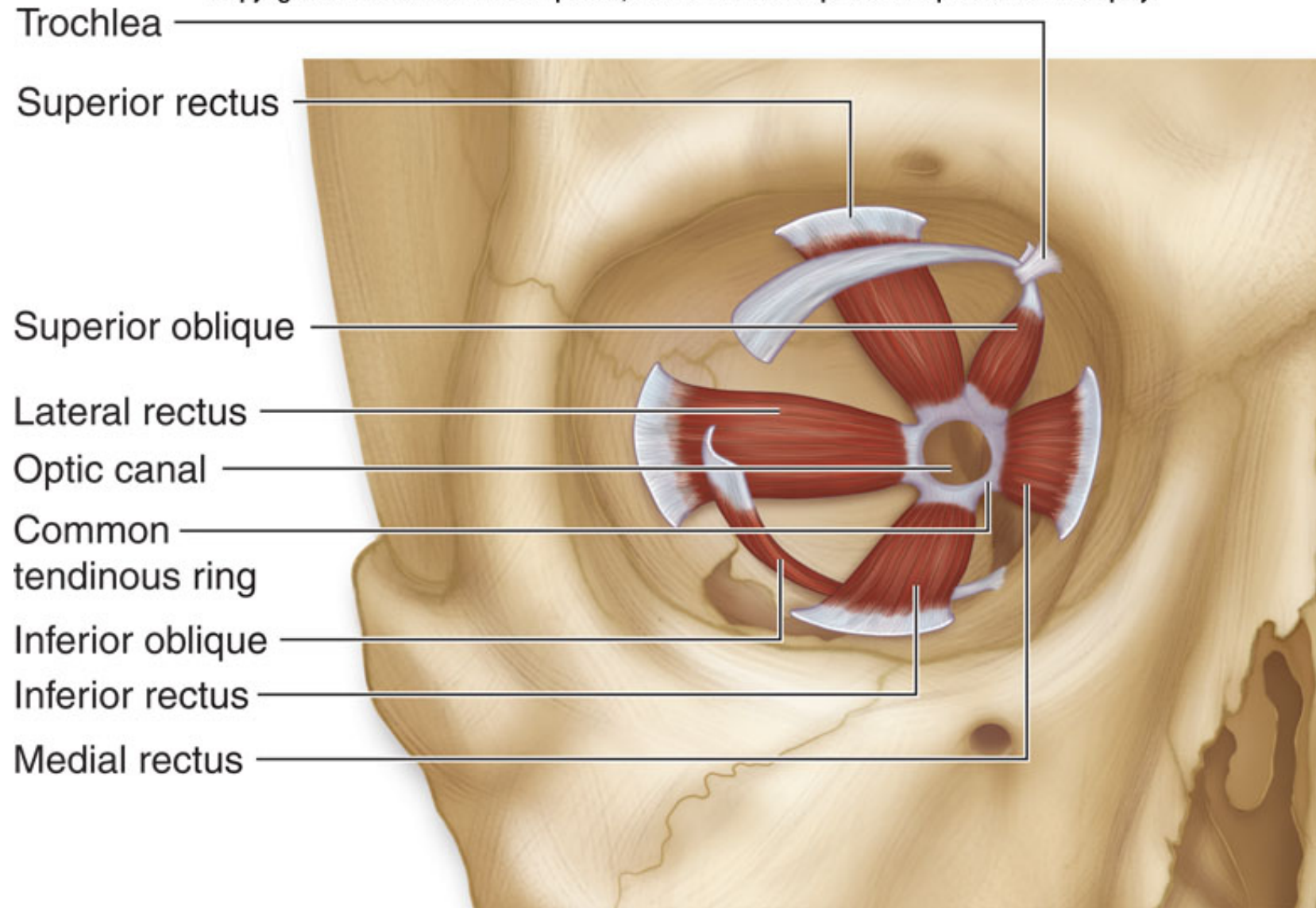
- Often called **extraocular** muscles.
- Move the eyes.
- Are termed **extrinsic** because they originate within the orbit and insert onto the sclera.
- **Six** extrinsic eye muscles.
 - the rectus muscles
 - (medial, lateral, inferior, and superior)
 - the oblique muscles (inferior and superior)



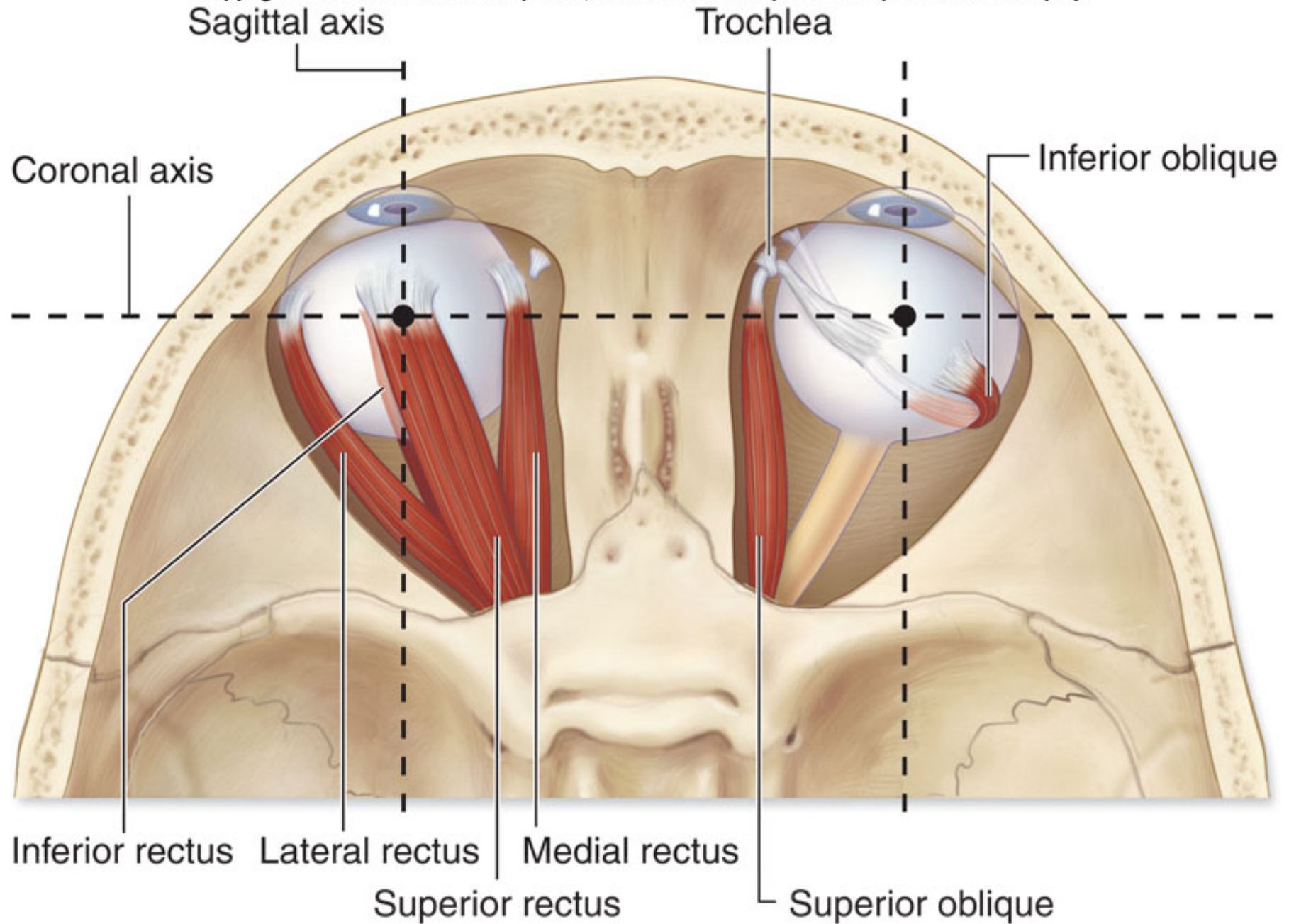
(a) Lateral view, right eye



(b) Medial view, right eye



(c) Anterior view of right orbit, eye removed

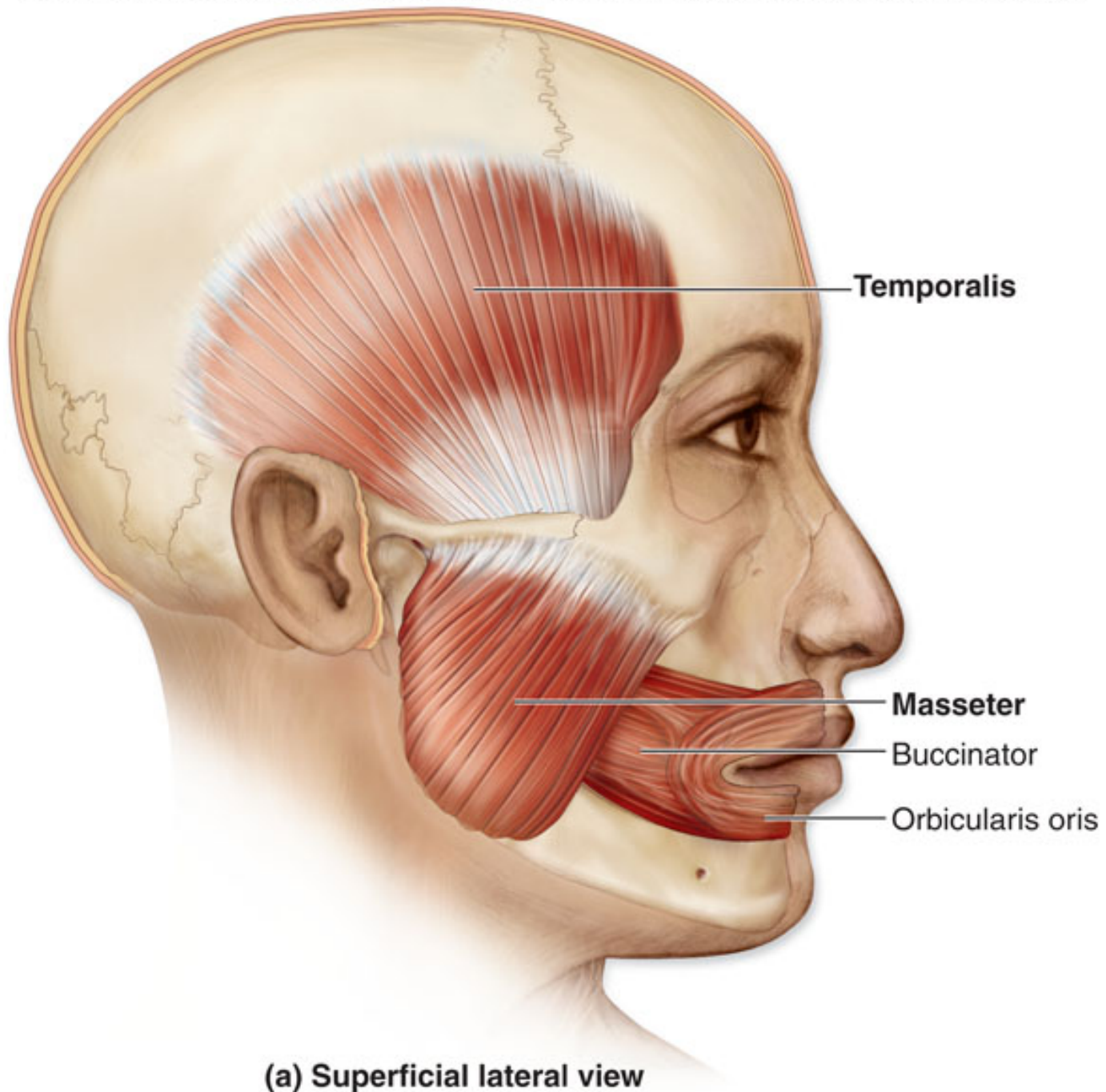


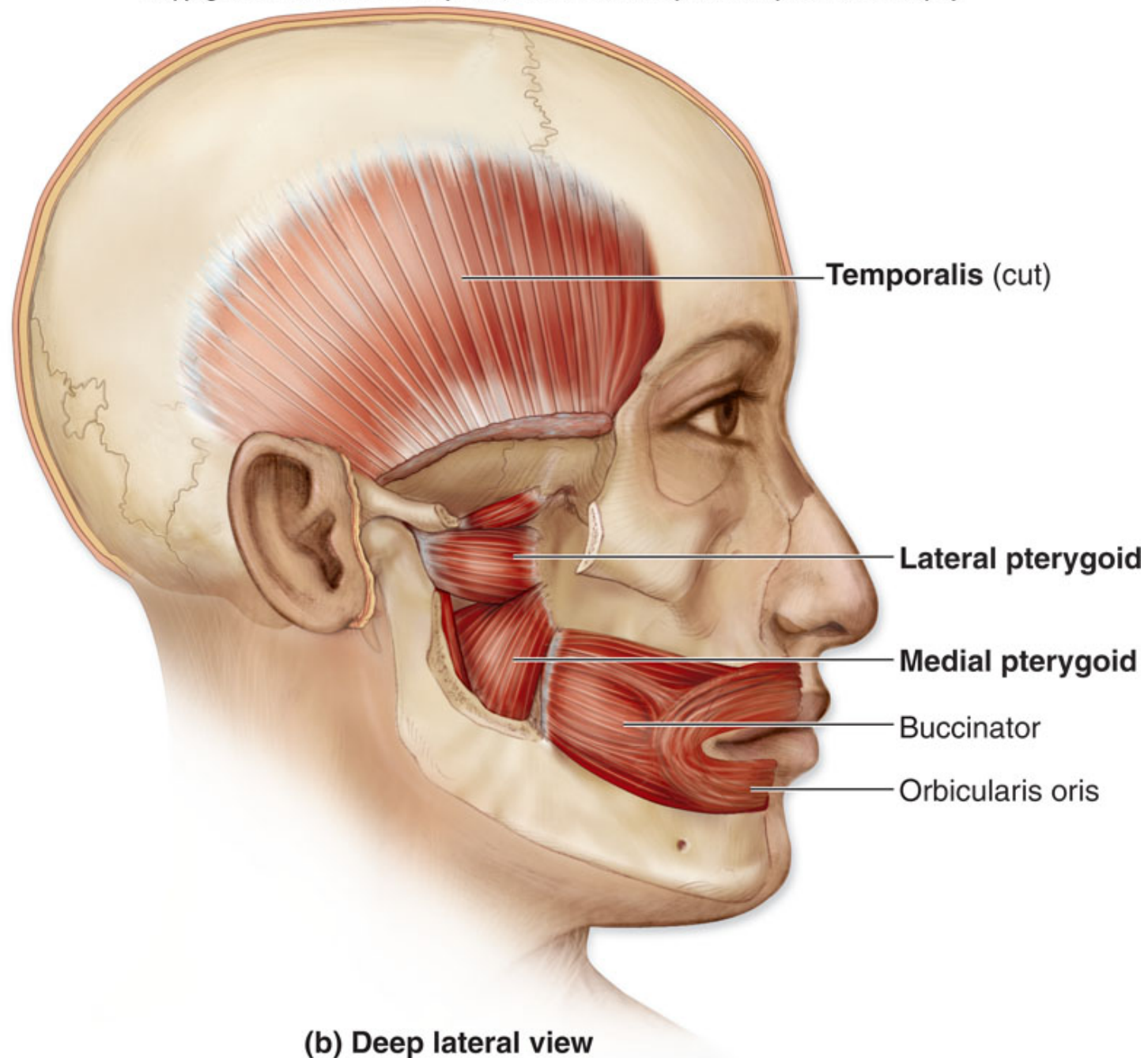
(d) Superior view



Muscles of Mastication

- Refers to the process of **chewing**.
- Move the mandible at the temporomandibular joint.
- **Four** paired muscles of mastication
 - temporalis
 - masseter
 - lateral pterygoids
 - medial pterygoids

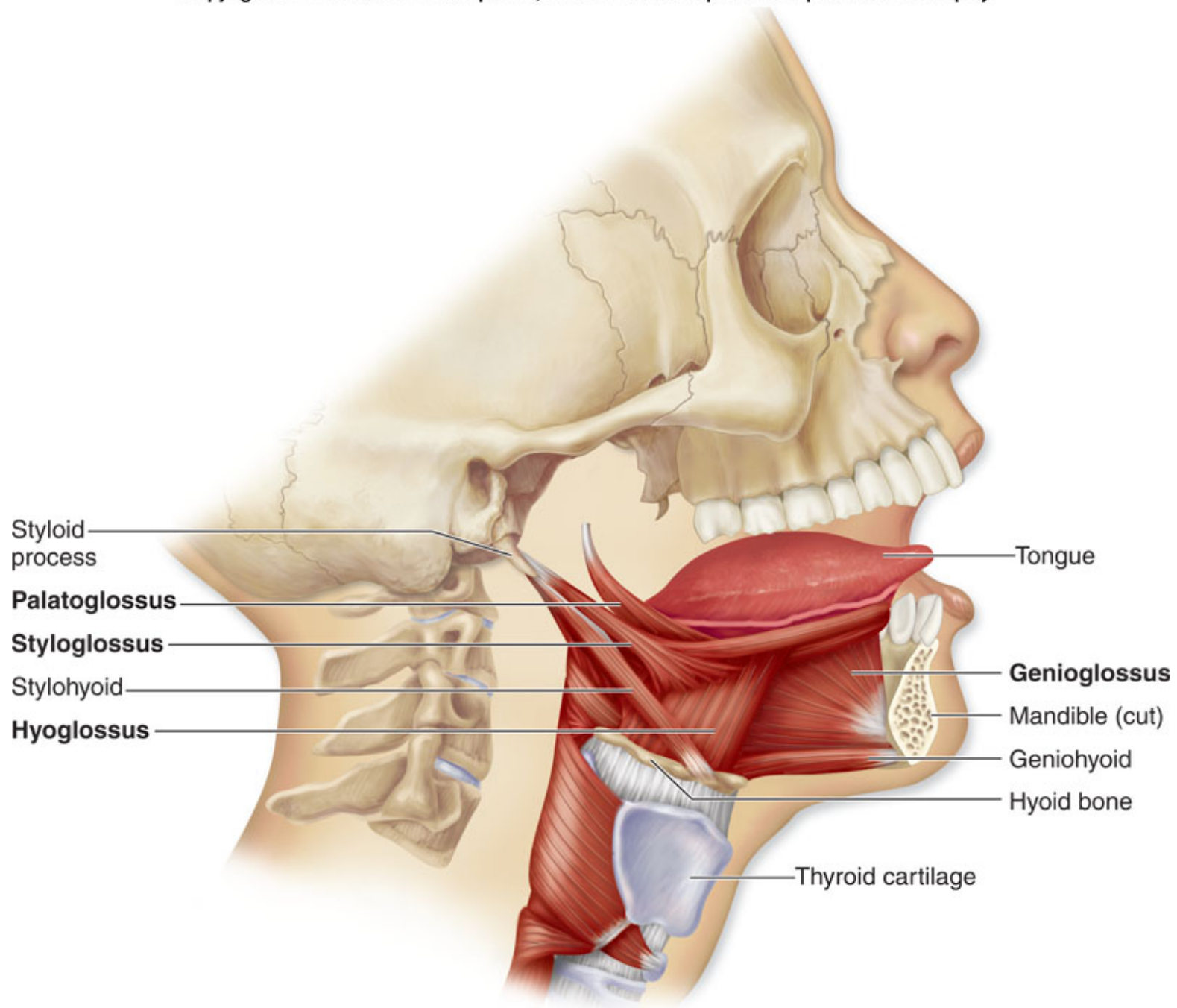






Muscles That Move the Tongue

- The left and right **genioglossus muscles** originate on the mandible and protract the tongue.
- The left and right **styloglossus muscles** originate on the styloid processes of the temporal bone.
 - elevate and retract the tongue (pull the tongue back into the mouth)
- The left and right **hyoglossus muscles** originate at the hyoid bone and insert on the sides of the tongue.
 - Depress and retract the tongue
- The left and right **palatoglossus muscles** originate on the soft palate.
 - elevate the posterior portion of the tongue

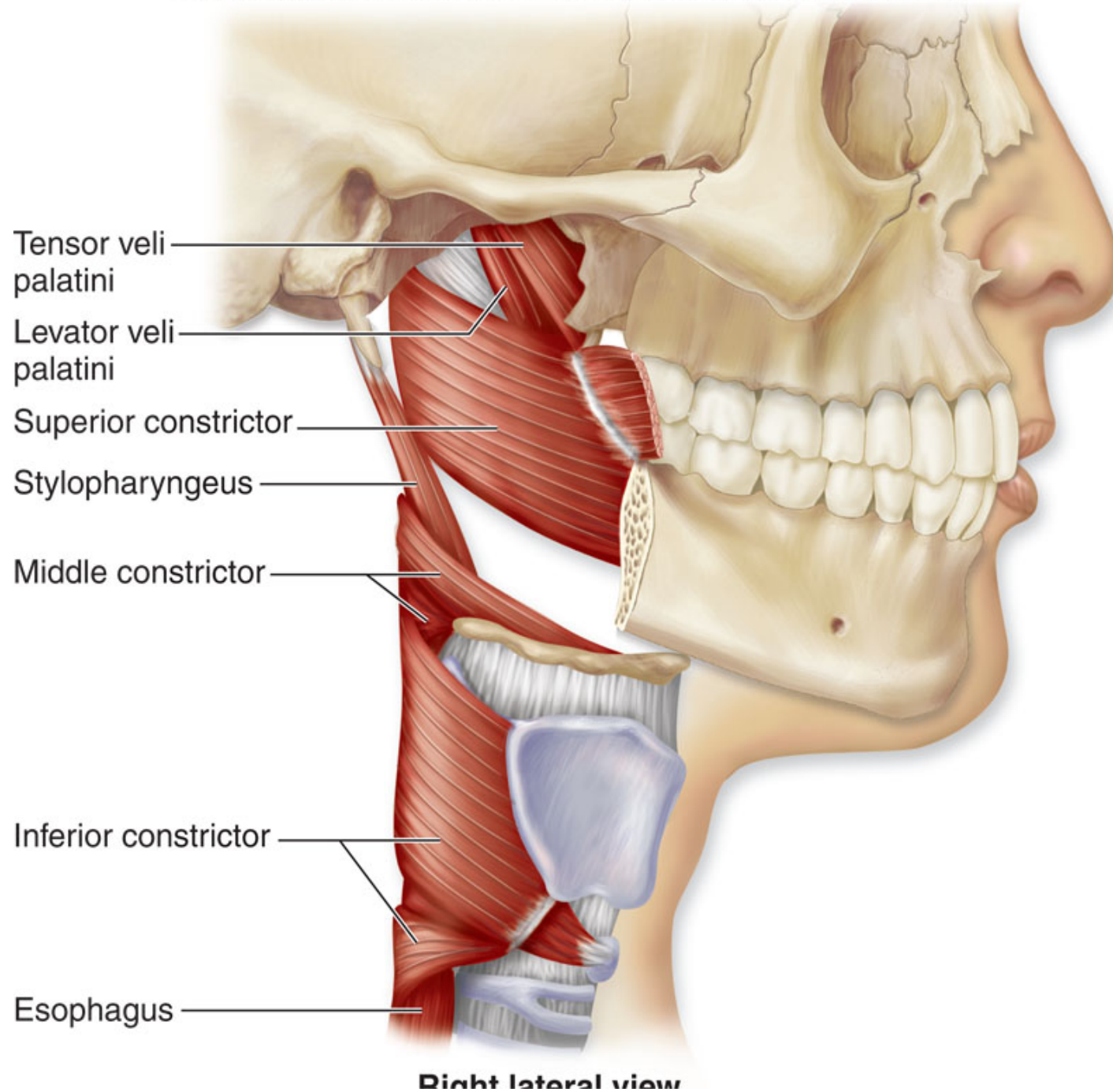


Right lateral view



Muscles That Move the Tongue

- The tongue is an agile, highly mobile organ.
- It consists of **intrinsic muscles** that curl, squeeze, and fold the tongue during chewing and speaking.
 - the tongue itself is a big muscle
- **Extrinsic muscles** of the tongue, originate on other head and neck structures and insert on the tongue.
 - glossus = "tongue"
- Used in various combinations to accomplish the precise, complex, and delicate tongue movements required for proper speech.
- **Manipulate food within the mouth** in preparation for swallowing.





Muscles of the Pharynx

- Commonly known as the “throat.”
- Is a funnel-shaped tube that lies posterior to both the oral and nasal cavities.
- Muscles help form or attach to this tube and aid in swallowing.
- Primary pharynx muscles are the pharyngeal constrictors (superior, middle, and inferior).
- Initiate swallowing and force the bolus inferiorly into the esophagus.
- Help elevate or tense the palate when swallowing.



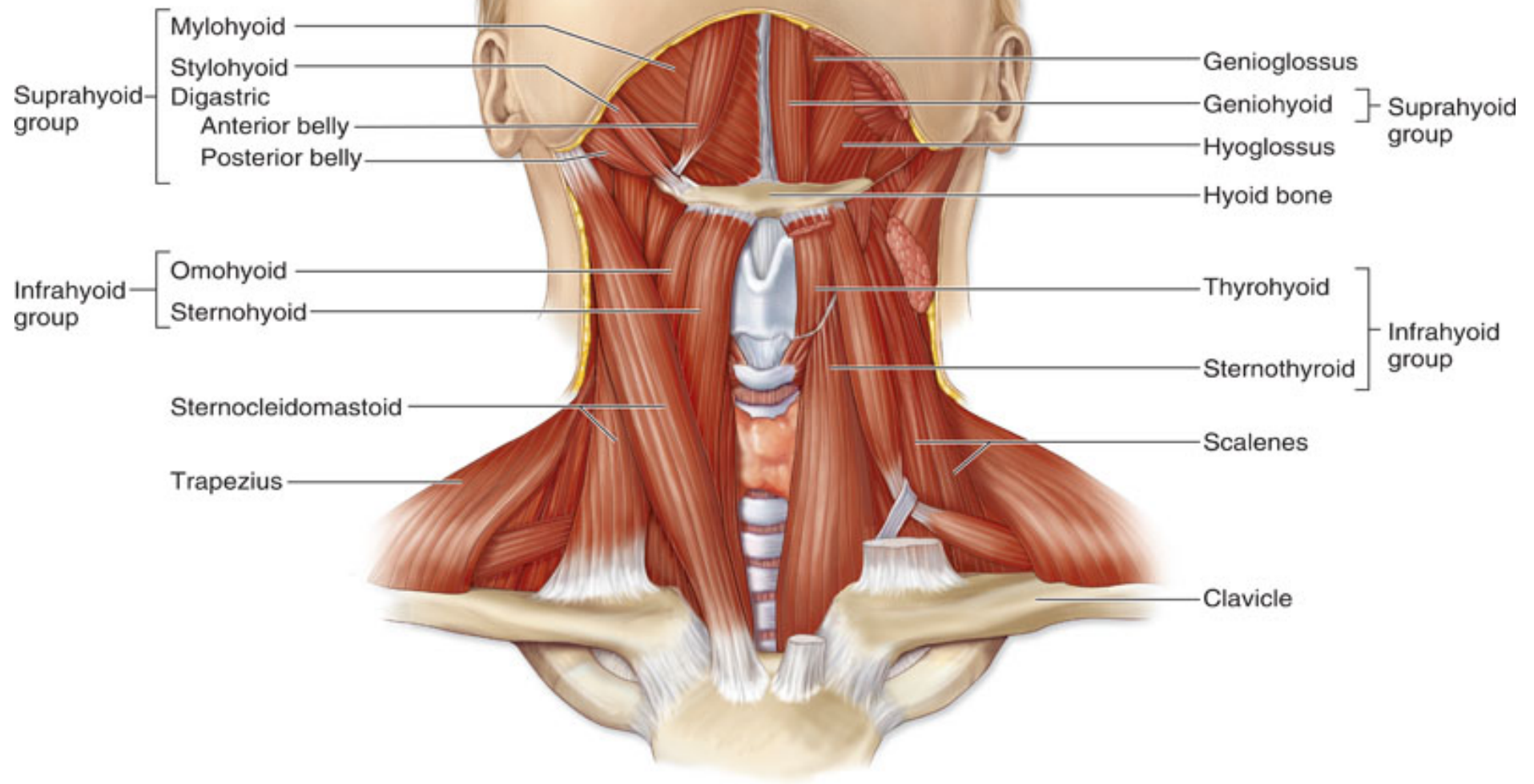
Muscles of the Anterior Neck

- The **suprahyoid muscles** are superior to the hyoid bone.
- The **infrahyoid muscles** are inferior to the hyoid bone.

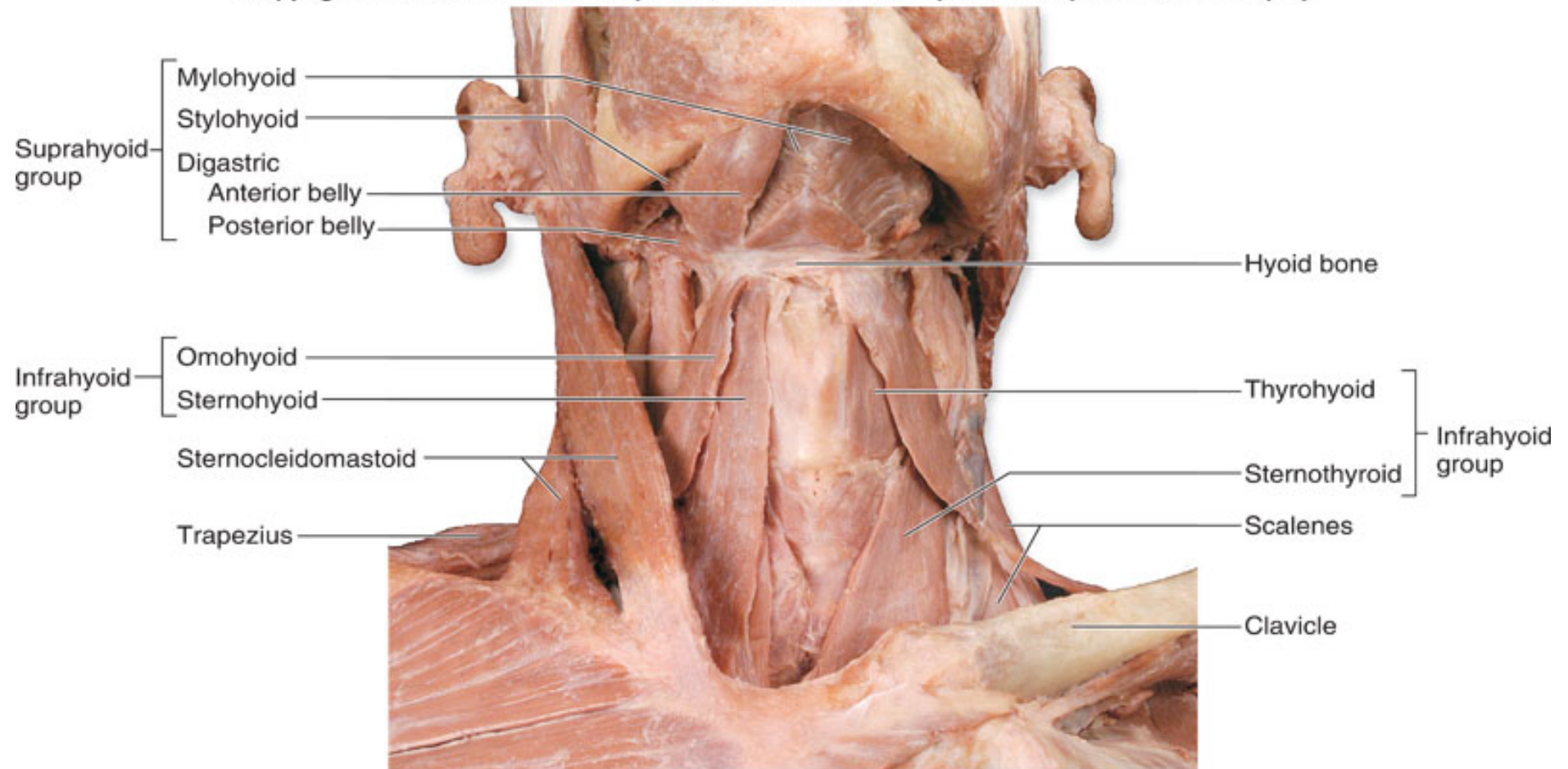
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Superficial

Deep



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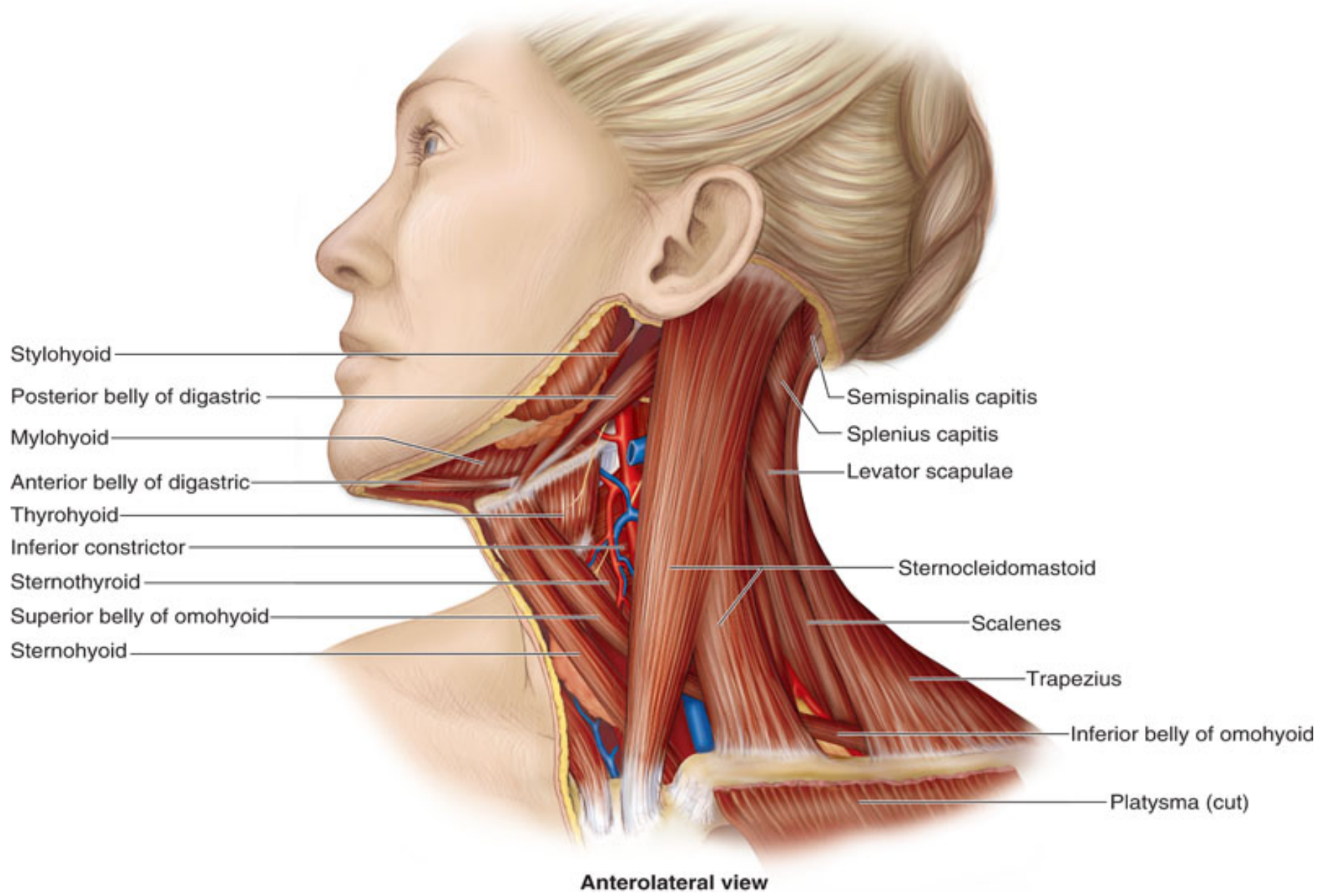


Anterior view



Anterior and Lateral Neck Muscles

- Flex the head and neck downward.
 - “neck flexion” and “head flexion” refer to the same movement
- The main muscles are the sternocleidomastoid and the three scalenes.





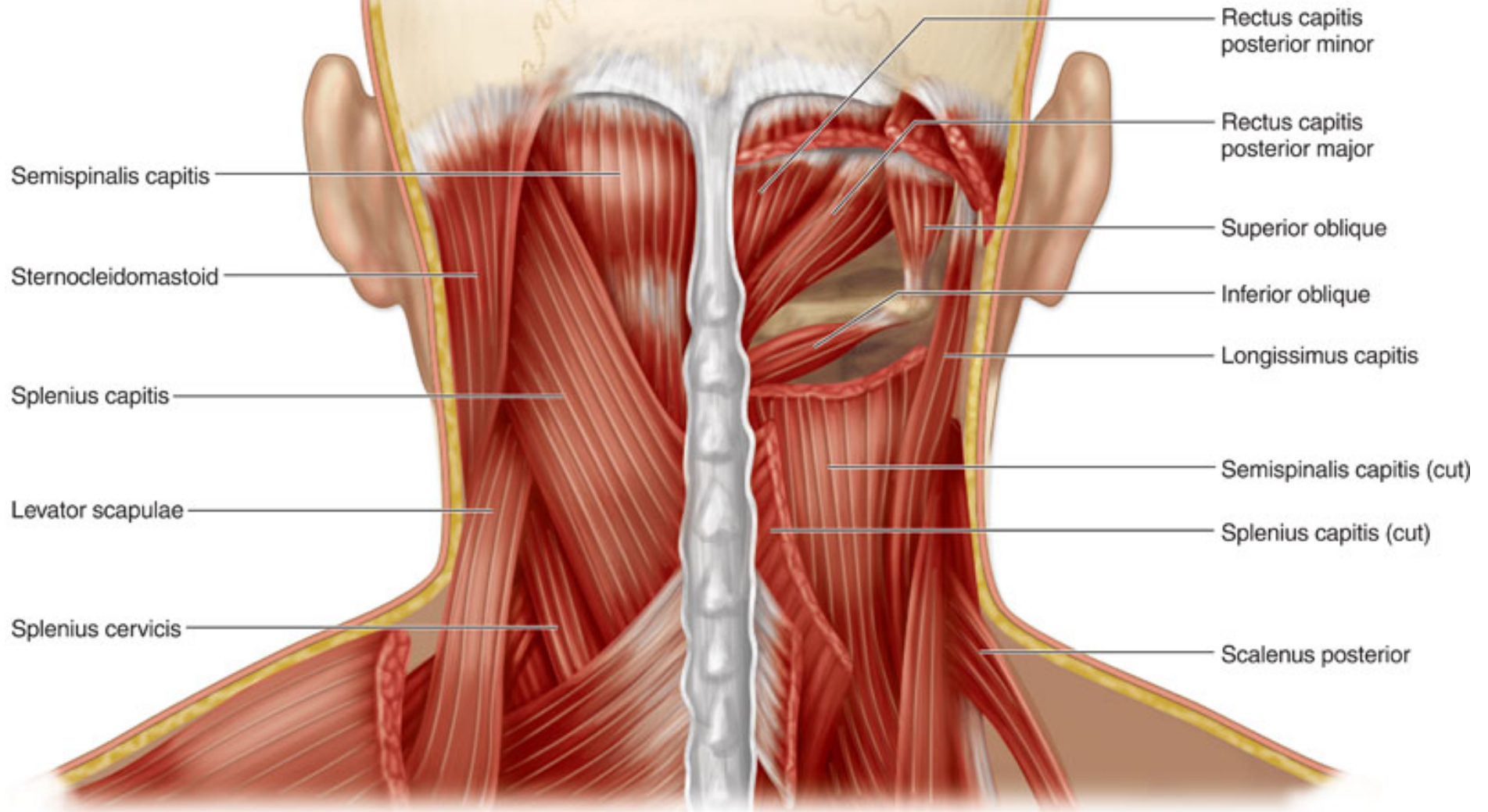
Posterior Neck Muscles

- **Extend** the head/neck.
- The trapezius attaches to the skull and helps extend the head/neck.
- Primary function is to help move the pectoral girdle.

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Deep

Deeper





Posterior view



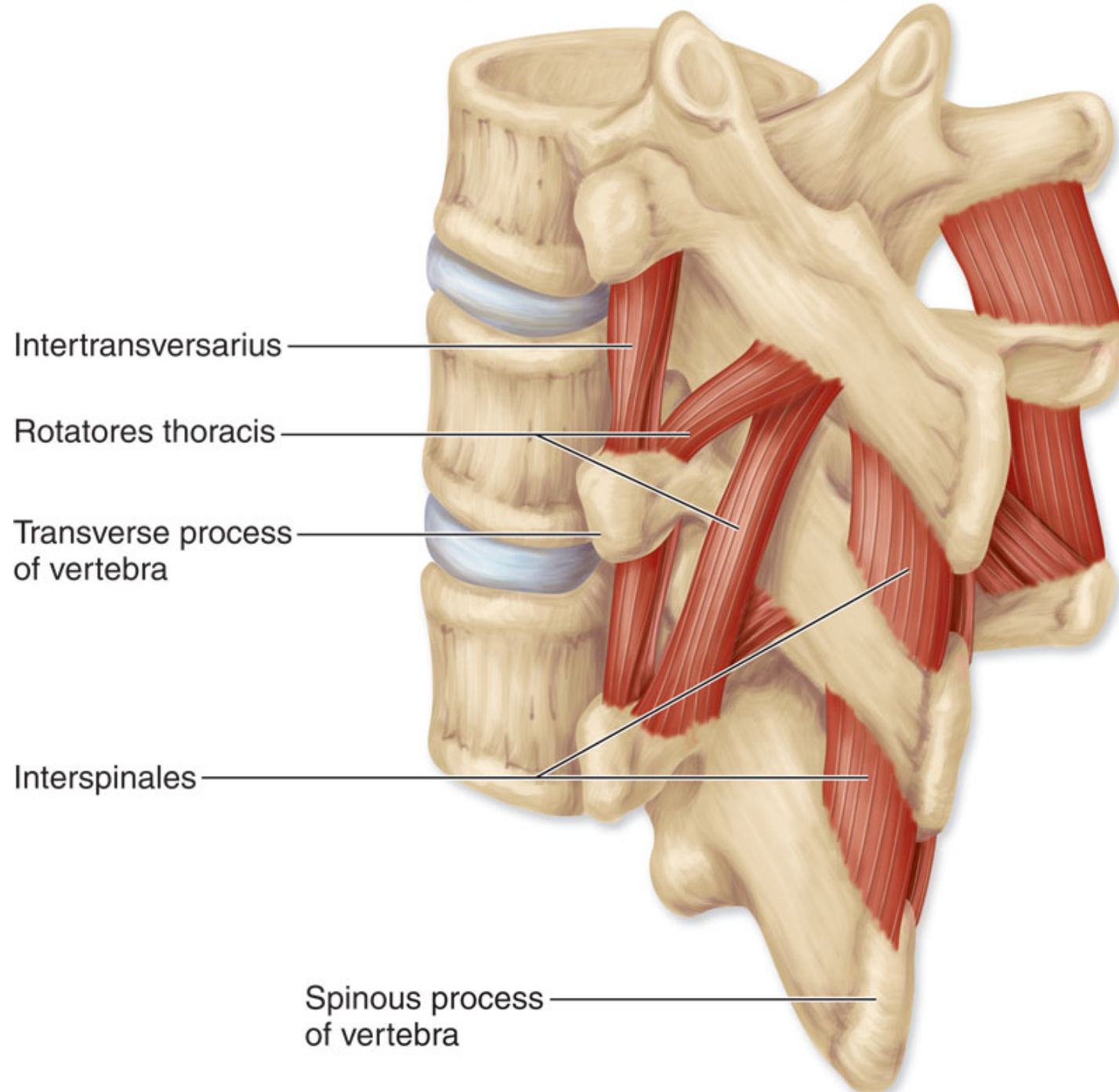
Muscles of the Vertebral Column

- Very complex.
- Have multiple origins and insertions.
- Exhibit quite a bit of overlap.
- Are covered by the most superficial back muscles.
 - trapezius and latissimus dorsi
- The “neck” is the cervical portion of the vertebral column.
- The muscles extend the cervical portion of the vertebral column.





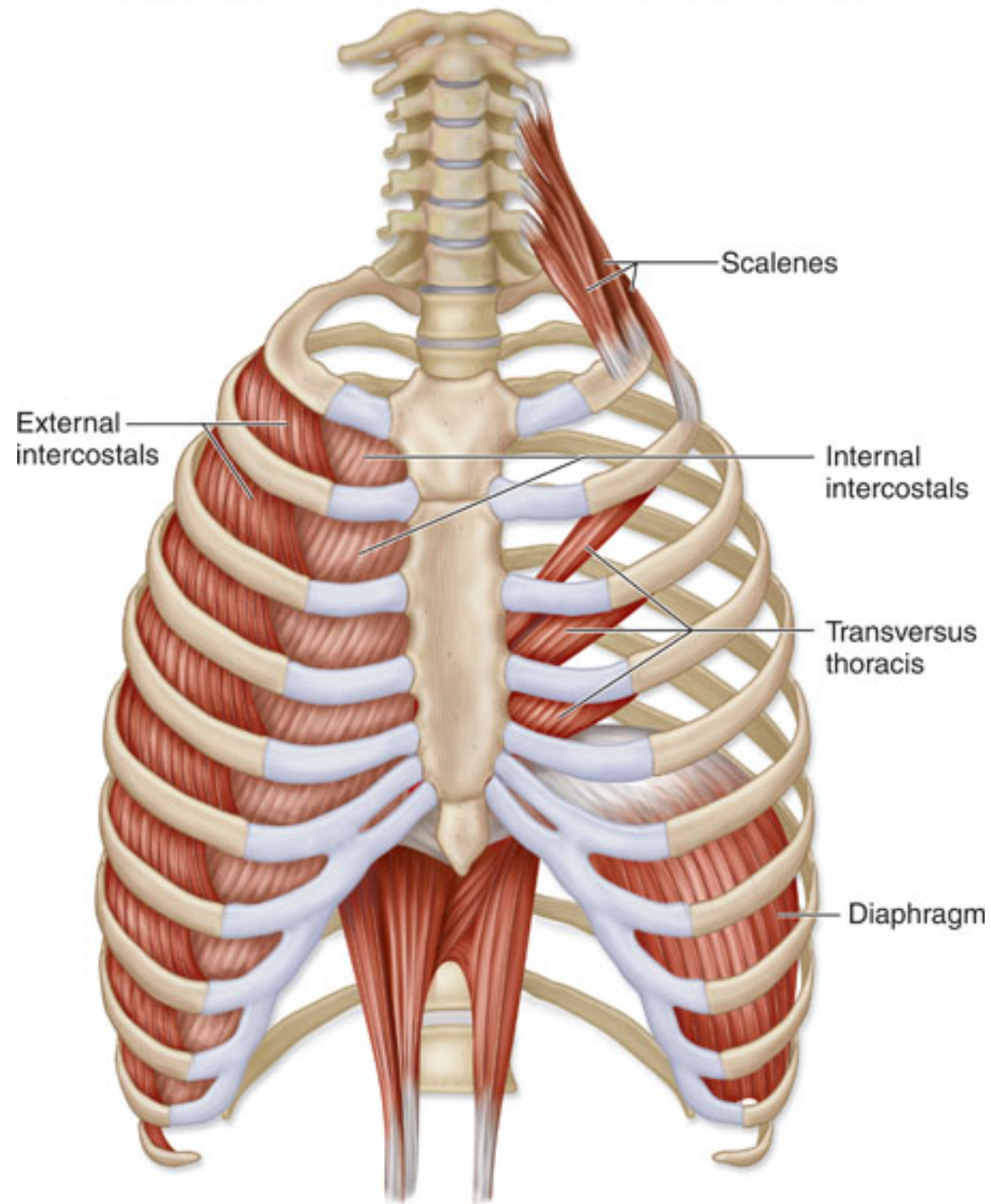
Posterior view



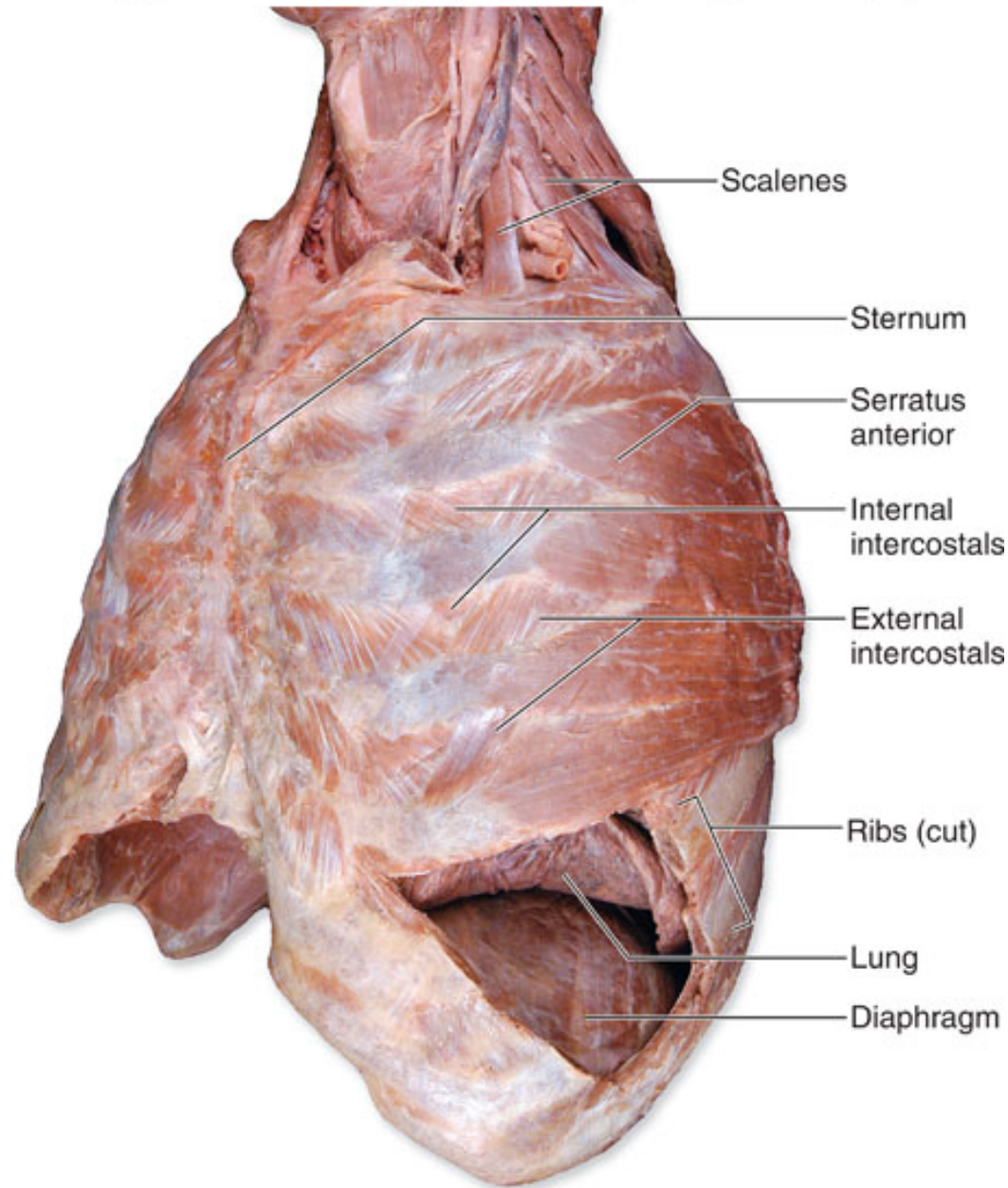


Muscles of Respiration

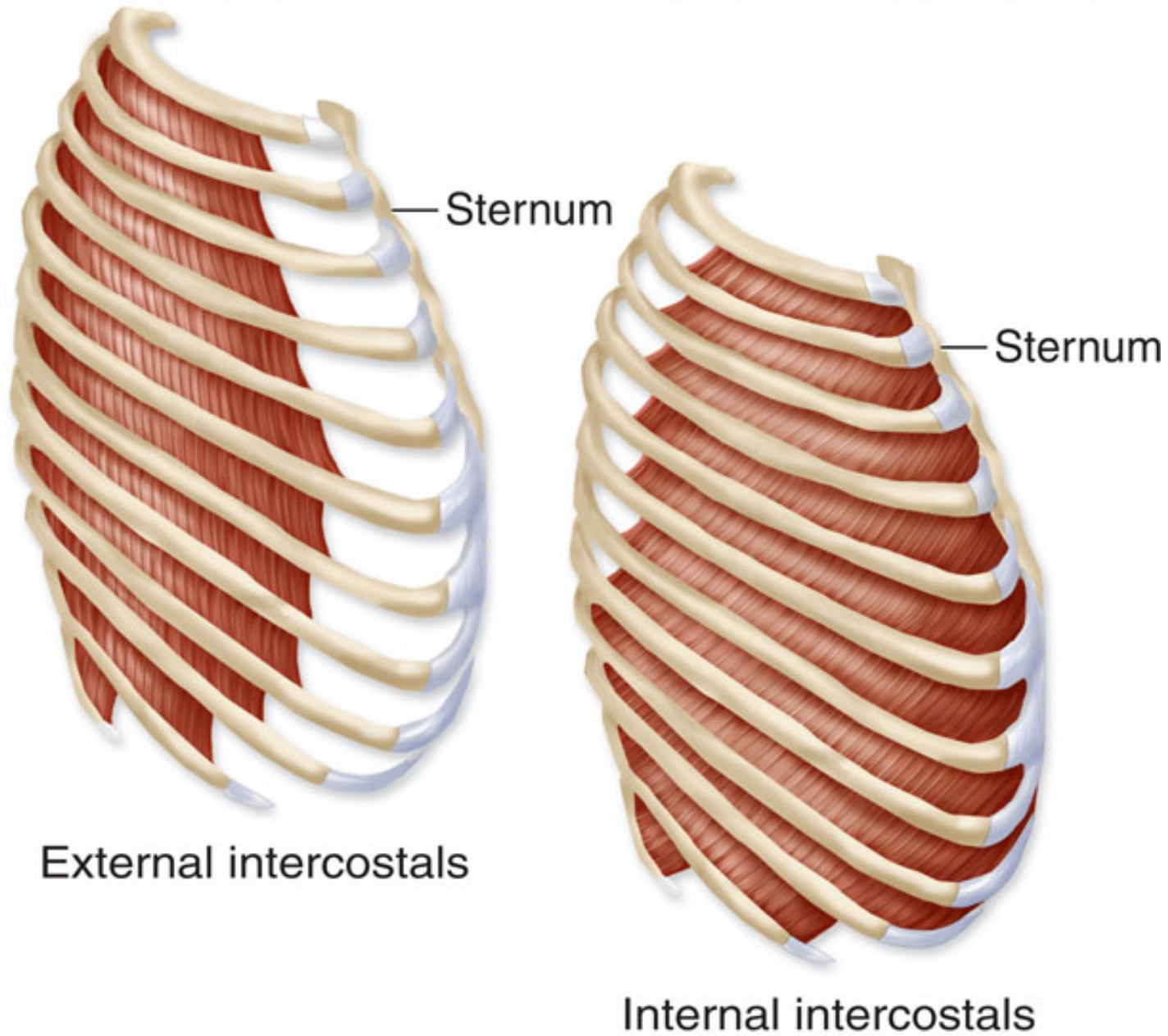
- Respiration involves **inhalation** and **exhalation**.
- **During inhalation**, several muscles contract to increase the dimensions of the thoracic cavity as the lungs fill with air.
- The thoracic cavity expands both to cause the lungs to fill with air and to accommodate the expanding lungs.
- **During exhalation**, some respiratory muscles contract and others relax, collectively decreasing the dimensions of the thoracic cavity and forcing air out of the lungs.
- Are on the anterior and posterior surfaces of the **thorax**.
- Are covered by more **superficial** muscles that move the upper limb.



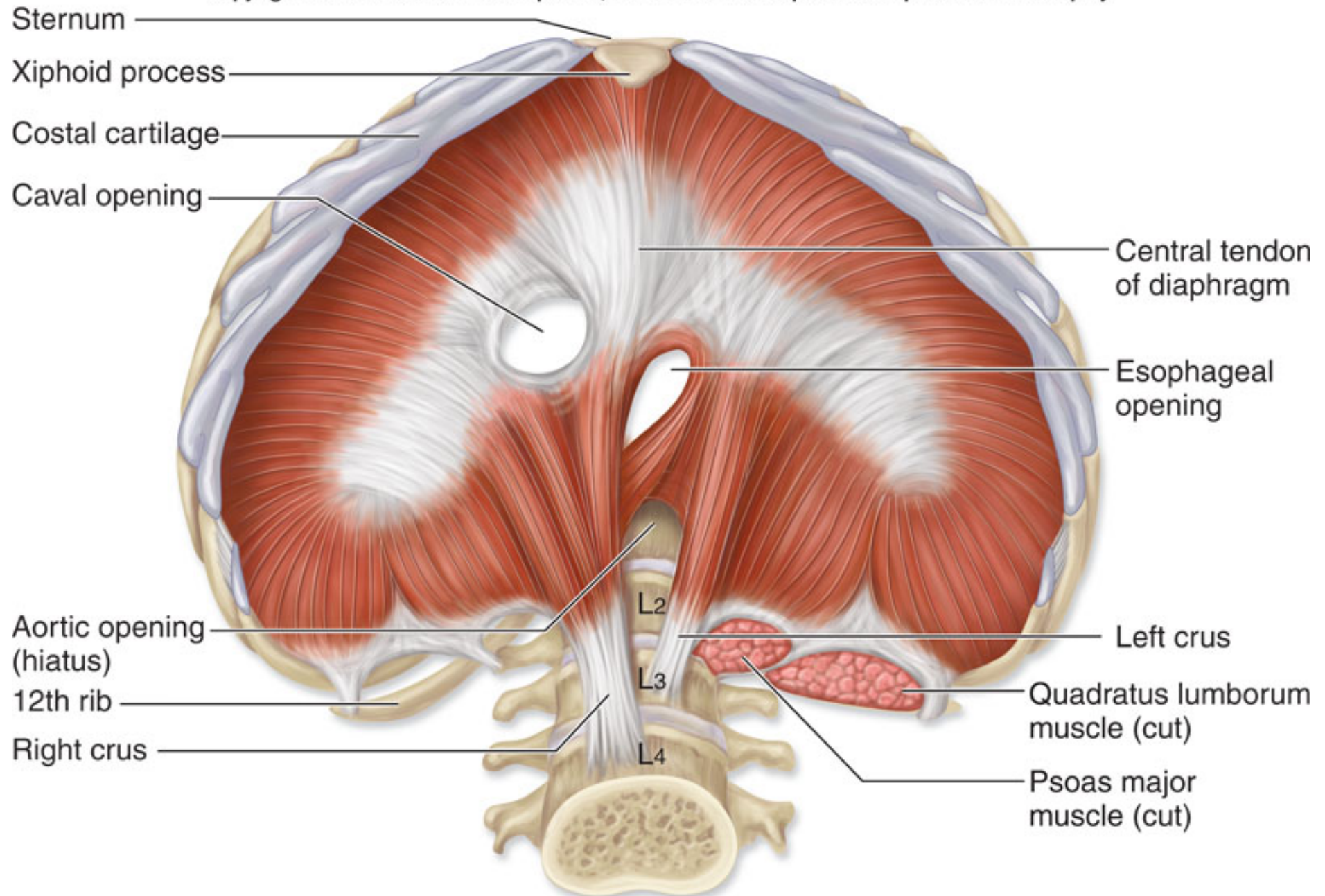
(a) Anterior view



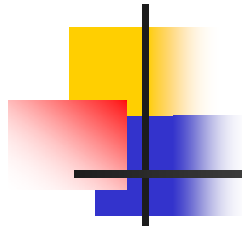
(b) Anterolateral view



(c) Lateral view

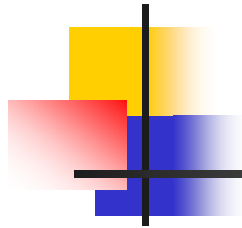


(d) Diaphragm, inferior view



The Diaphragm

- Is an internally placed, **dome-shaped** muscle.
- Forms a **partition** between the thoracic and abdominal cavities.
- **The most important muscle associated with breathing.**
- The muscle fibers converge from its margins toward a fibrous central tendon.
- A strong aponeurosis is the insertion tendon for all peripheral muscle fibers.



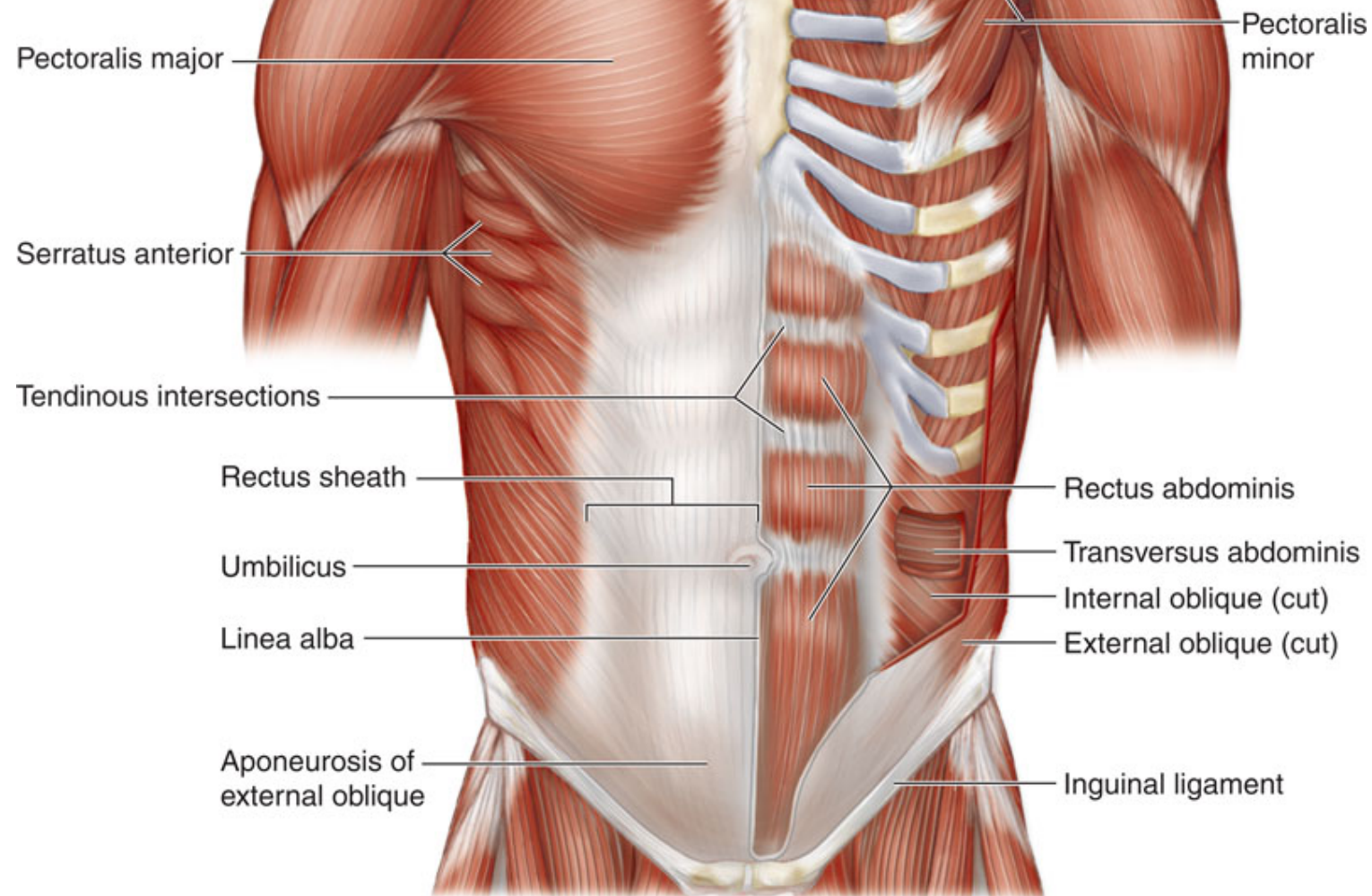
The Diaphragm

- When the diaphragm **contracts**, the central tendon is pulled inferiorly toward the abdominal cavity, thereby increasing the vertical dimensions of the thoracic cavity.
- As it **compresses the abdominal cavity**, it also increases intra-abdominal pressure.
- Also important in **helping return venous blood to the heart** from the lower half of the body.

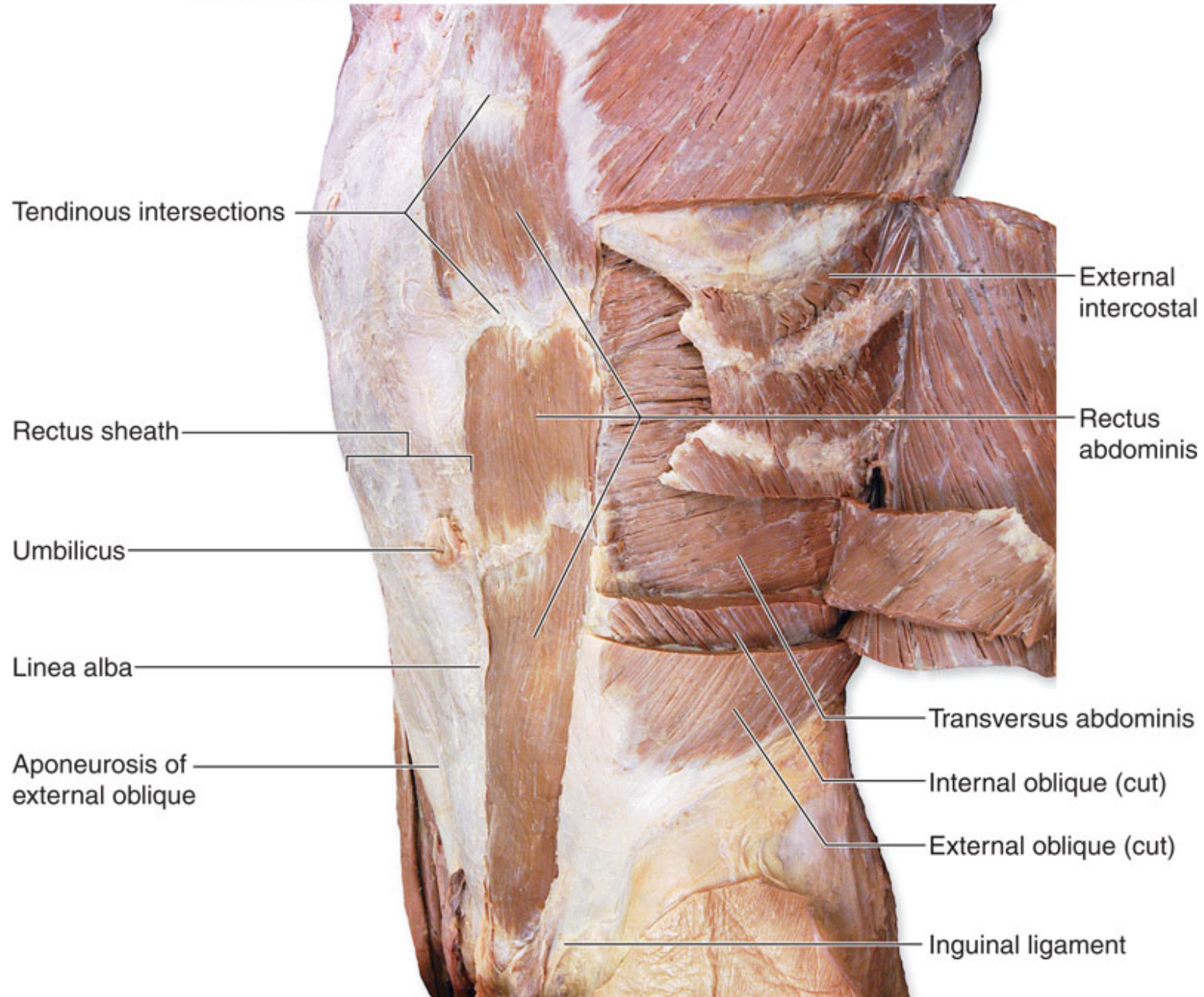


Muscles of the Abdominal Wall

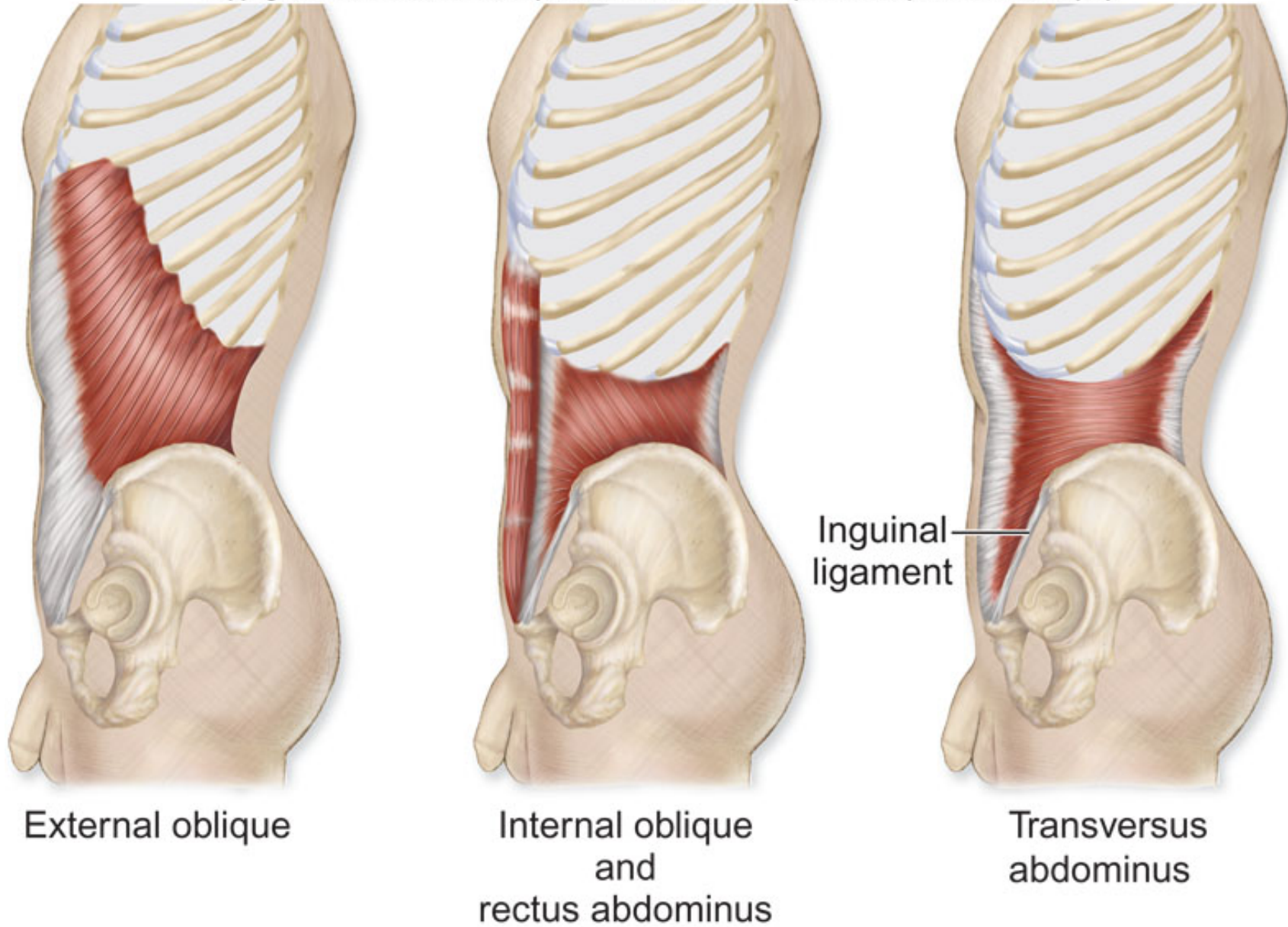
- Four pairs of muscles collectively compress and hold the abdominal organs in place.
 - the external oblique
 - internal oblique
 - transversus abdominis
 - rectus abdominis
- Work together to flex and stabilize the vertebral column.
- When they unilaterally contract they laterally flex the vertebral column.



(a) Anterior view



(b) Anterolateral view

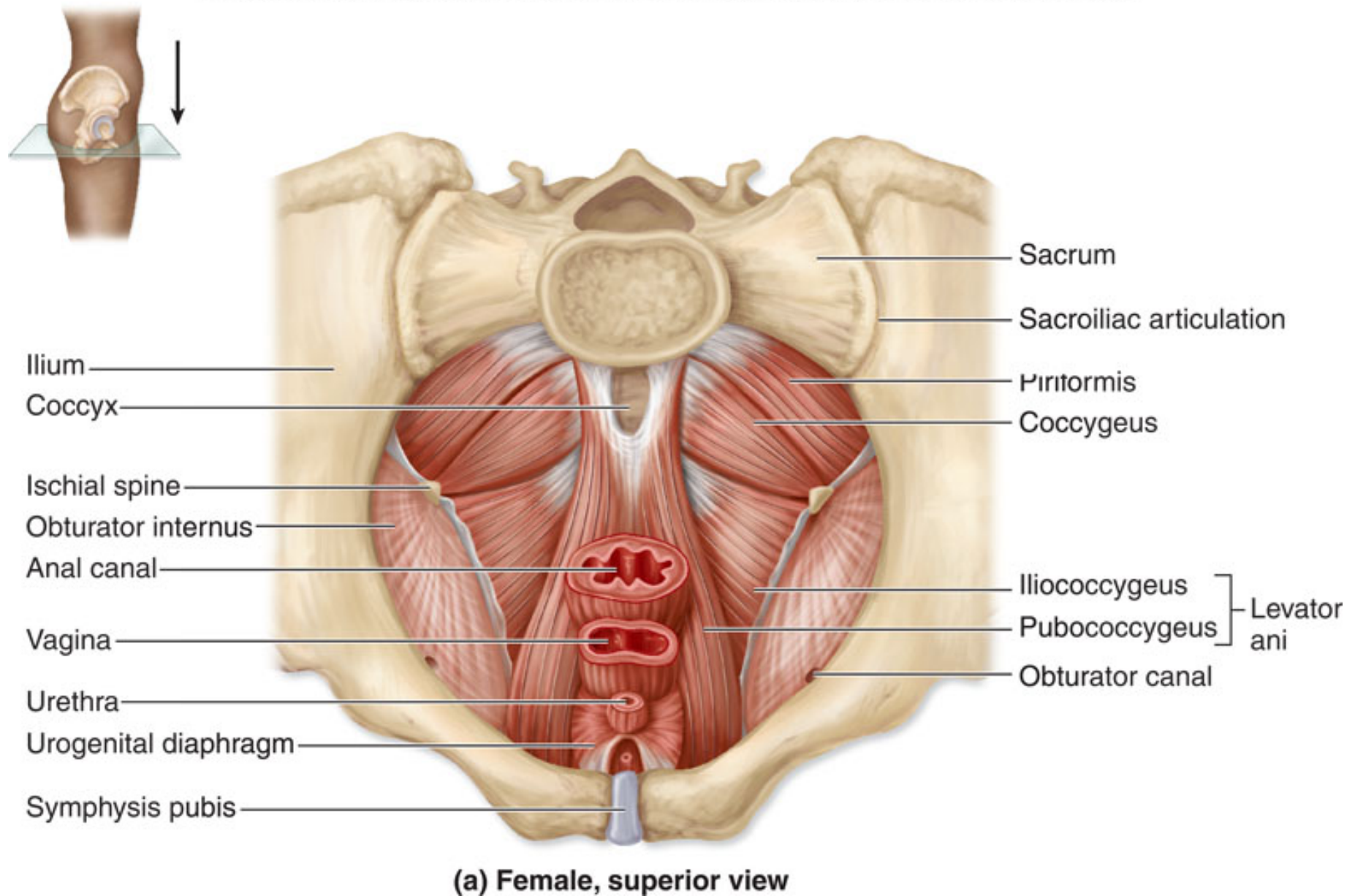


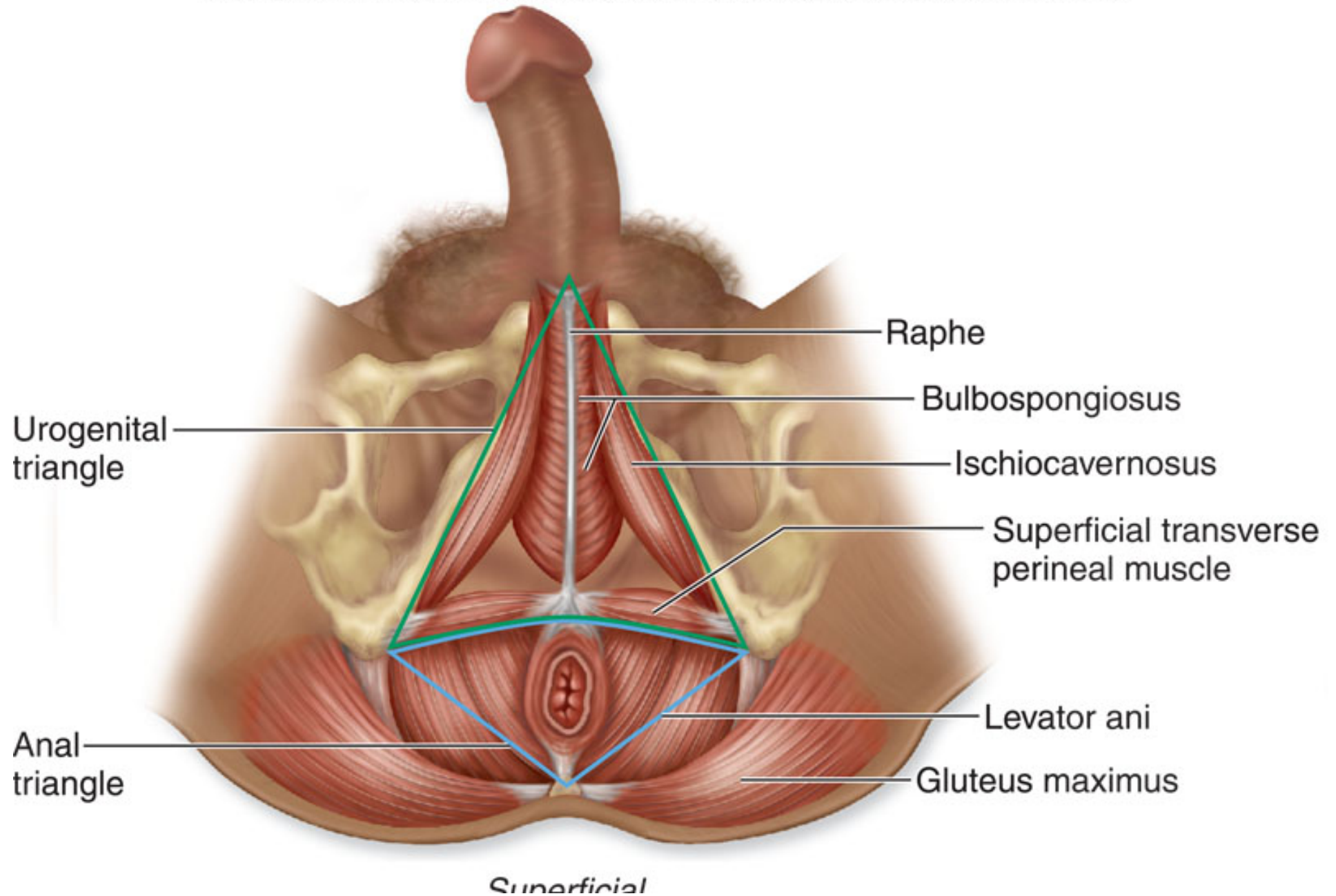
(c)

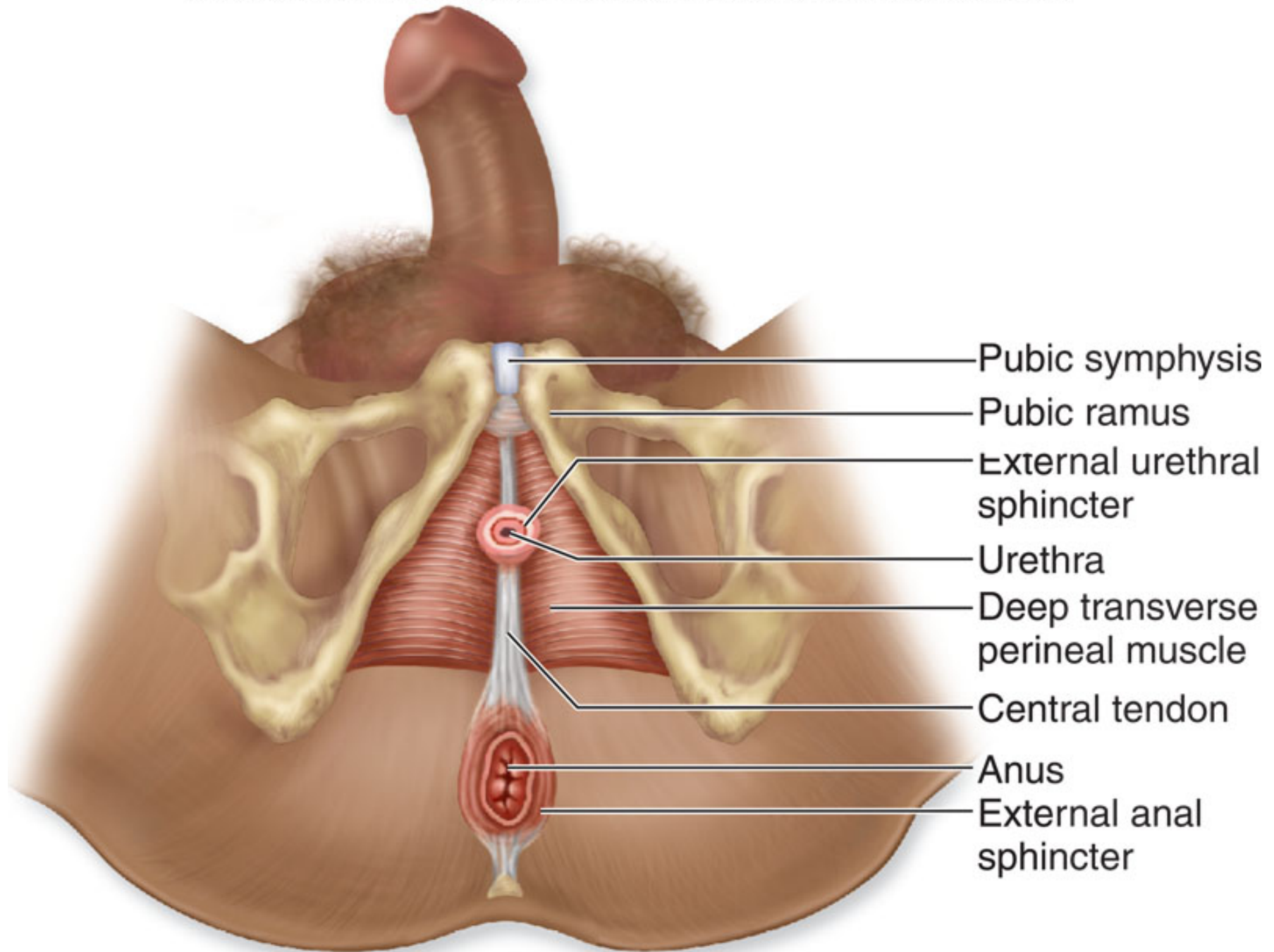


Muscles of the Pelvic Floor

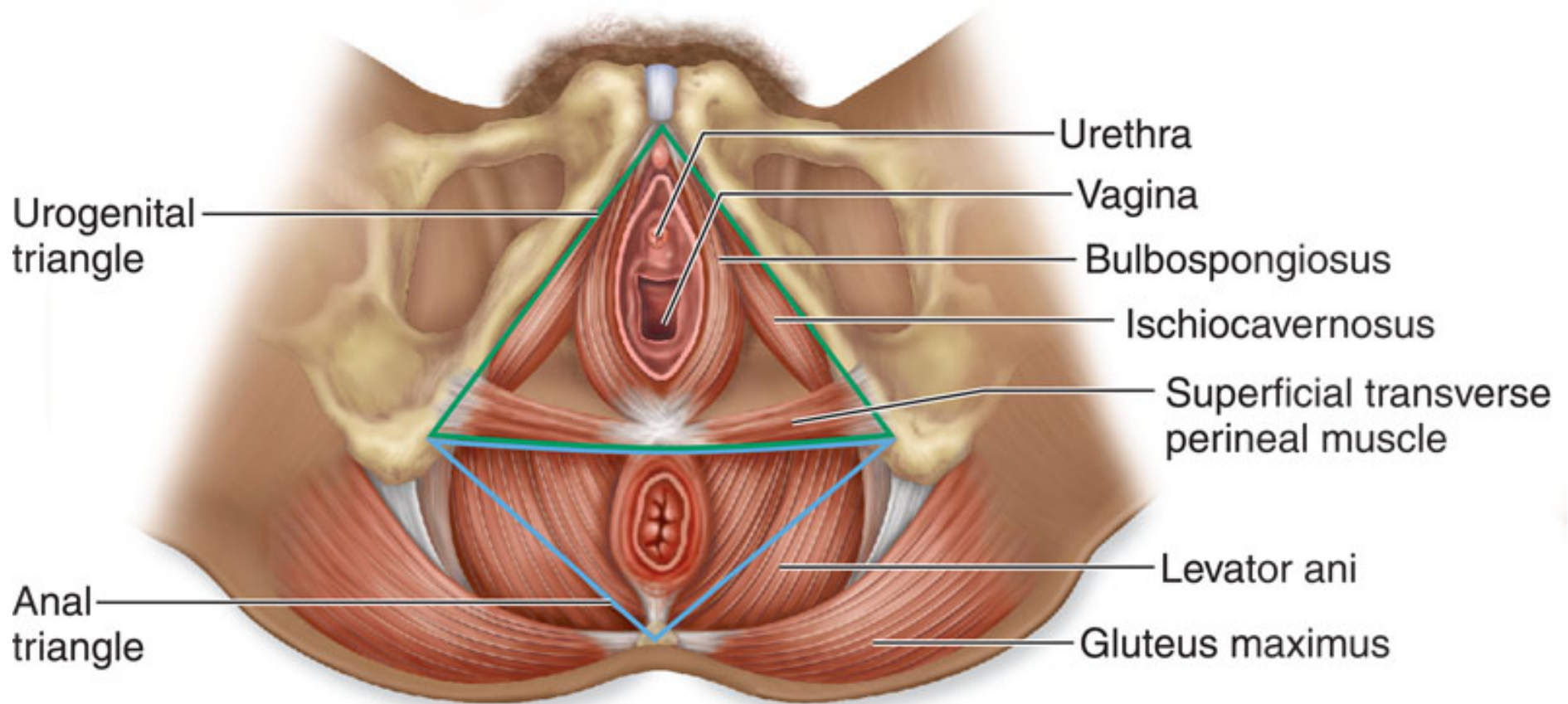
- Formed by **three layers of muscles** and associated fasciae, collectively known as the **pelvic diaphragm**.
 - extends from the ischium and pubis of the ossa coxae across the pelvic outlet to the sacrum and coccyx
- Collectively form the **pelvic floor** and support the pelvic viscera
 - the **pelvic cavity floor** is composed of muscle layers that form the **urogenital and anal triangles**, extend across the **pelvic outlet**, and support the organs in the **pelvic cavity**





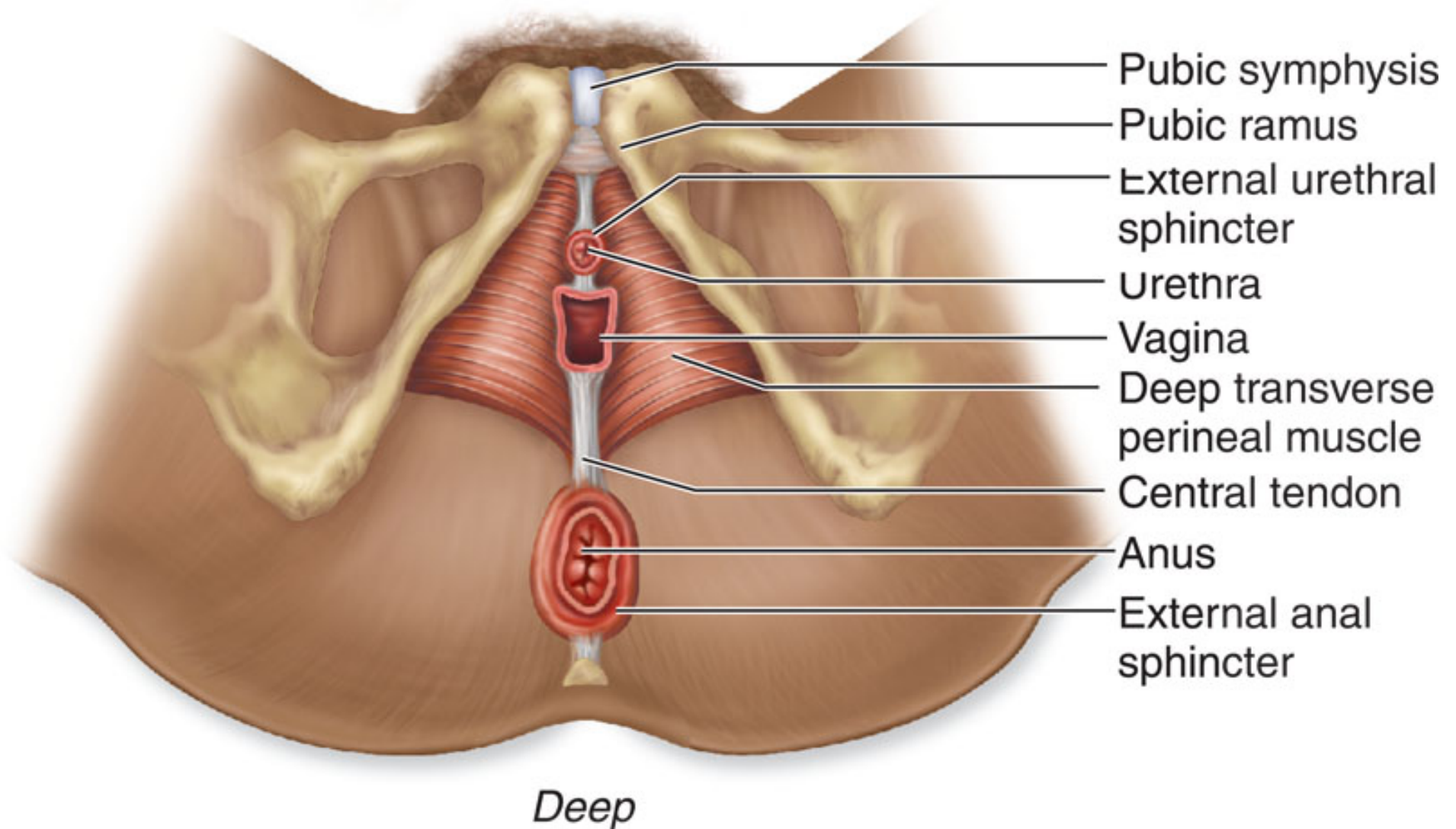


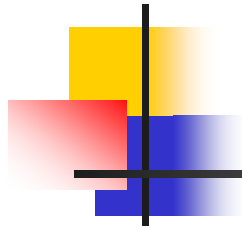
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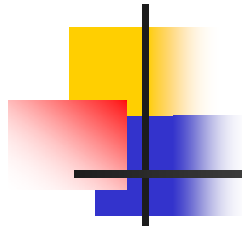
Hernias

- A portion of the viscera protrudes through a weakened point of the muscular wall of the abdominopelvic cavity.
- Significant medical problem develops if the herniated portion of the intestine **swells**, becoming **trapped**.
- Blood flow to the trapped segment may diminish, causing that portion of the intestine to **die**.
- Called a **strangulated intestinal hernia**.
 - is very painful and can be **life-threatening**



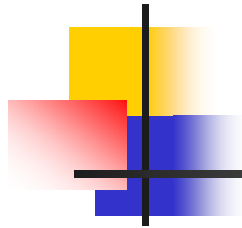
Two Types of Hernias

- There are **two types of hernias**.
 - inguinal hernias and
 - femoral hernias
- An inguinal hernia is the **most common type** of hernia to require treatment.
- The inguinal region is one of the **weakest** areas of the abdominal wall.



Inguinal Hernia

- Males are more likely to develop inguinal hernias than females.
- Rising pressure in the abdominal cavity provides the force to push a segment of the small intestine into the canal.
- There are two types of inguinal hernia.
 - **direct inguinal hernia** - the loop of small intestine protrudes directly through the superficial inguinal ring, but not down the entire length of the inguinal canal, and creates a bulge in the lower anterior abdominal wall
 - **indirect inguinal hernia** - herniation travels down the entire inguinal canal and may even extend all the way into the scrotum



Femoral Hernia

- Occurs in the upper thigh, just inferior to the inguinal ligament, originating in the femoral triangle.
- Medial part of the femoral triangle is relatively weak and prone to stress injury, allowing a loop of small intestine to protrude.
- Women more commonly develop femoral hernias because of the greater width of their femoral triangle.