

MUSCLES OF THE AXIAL SKELETON

HEAD MUSCULATURE

The muscles located in the head region fall into two groups: those that are involved in facial expression and those that are involved in chewing (mastication) and tongue movement.

Muscles Promoting Facial Expression (Marieb / Hoehn – Chapter 10; Pgs. 329 – 331; Figure 1)

MUSCLE:	ORIGIN:	INSERTION:	INNERVATION:	ACTION:
SCALP:				
Frontalis* (part of Epicranius)	epicranial aponeurosis	skin of eyebrows; root of nose	facial nerve	raises eyebrows; wrinkles forehead
Occipitalis* (part of Epicranius)	occipital bone / temporal bone	epicranial aponeurosis	facial nerve	pulls scalp posteriorly
FACE:				
Orbicularis oculi*	frontal / maxillary bone; ligaments around orbit	tissue of eyelid	facial nerve	closes eye
Zygomaticus* (major / minor)	zygomatic bone	skin at corner of mouth	facial nerve	raises corner of mouth upward ('smiling')
Risorius	fascia of masseter muscle	skin at corner of mouth	facial nerve	draws corners of lips laterally
Levator labii superioris	zygomatic bone / orbit of eye	skin of upper lip	facial nerve	opens lips

* Need to be familiar with on both ADAM and the human cadaver

MUSCLE:	ORIGIN:	INSERTION:	INNERVATION:	ACTION:
Depressor labii inferioris	body of mandible	skin of lower lip	facial nerve	draws lower lip inferiorly ('pout')
Depressor anguli oris*	body of mandible	skin at corner of mouth	facial nerve	draw corner of mouth downward ('frowning')
Orbicularis oris*	maxilla / mandible	skin / muscles at angles of mouth	facial nerve	closes lips; purses lips ('kissing / whistling')
Mentalis	mandible	skin of chin	facial nerve	wrinkles chin
Buccinator*	maxilla / mandible	orbicularis oris	facial nerve	compresses cheeks ('sucking')
Platysma*	fascia of chest	lower margin of mandible; skin at corner of mouth	facial nerve	tenses skin of neck; depresses mandible

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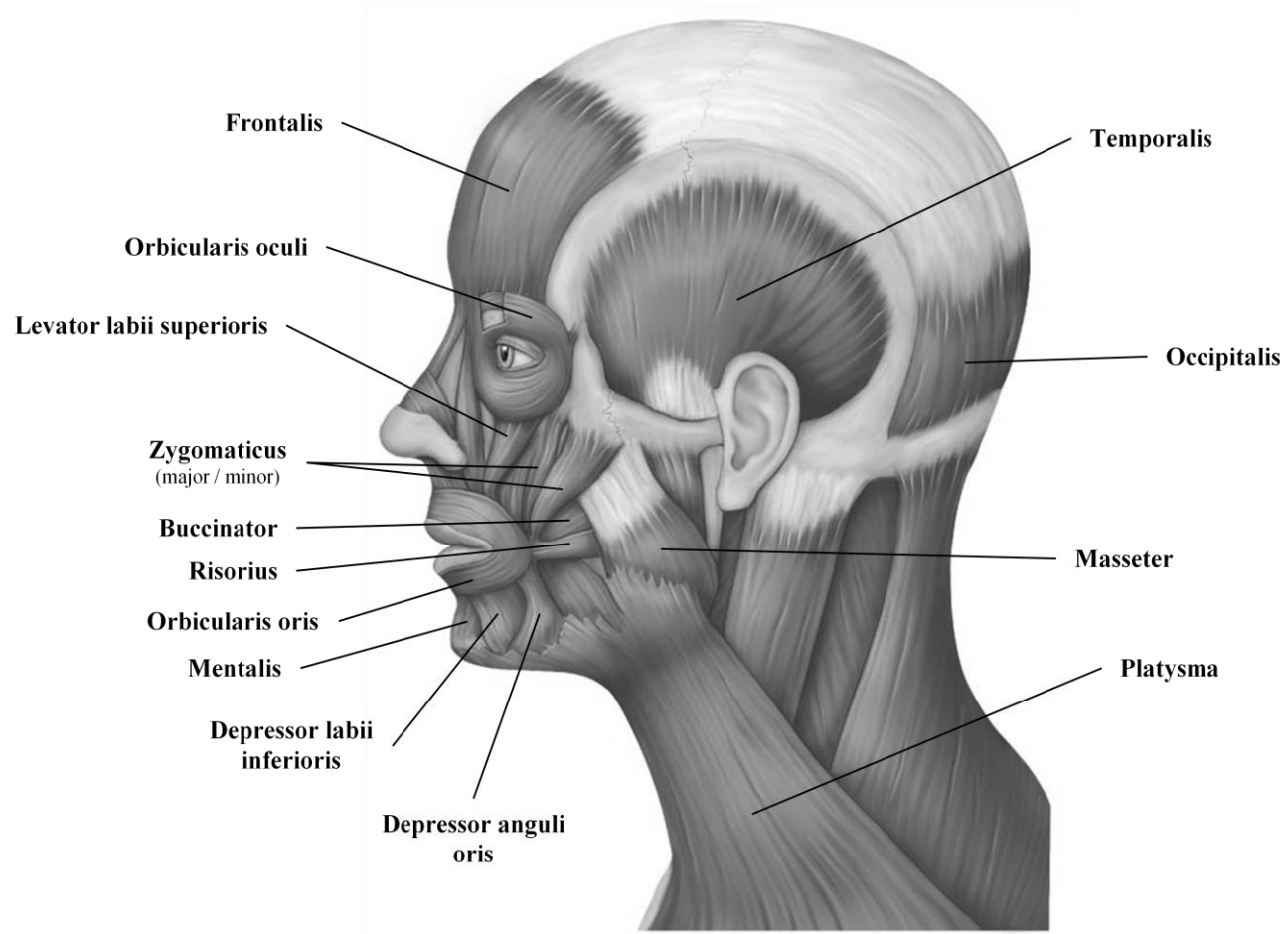


Figure 1: Lateral view of muscles of the scalp, face, and neck

Muscles Promoting Mastication / Tongue Movement (Marieb / Hoehn – Chapter 10; Pgs. 332 – 333; Figures 1 & 2)

MUSCLE:	ORIGIN:	INSERTION:	INNERVATION:	ACTION:
MASTICATION:				
Masseter*	zygomatic arch; zygomatic bone	angle / ramus of mandible	trigeminal nerve	elevates mandible
Temporalis*	temporal bone	coronoid process of mandible	trigeminal nerve	elevates mandible
Medial pterygoid	pterygoid process of sphenoid bone; maxilla	body of mandible	trigeminal nerve	protrudes jaw; promotes side-to-side chewing
Lateral pterygoid	greater wing / pterygoid process of sphenoid bone	mandibular condyle of mandible	trigeminal nerve	protrudes jaw; promotes side-to-side chewing
TONGUE MOVEMENT:				
Genioglossus	posterior body of mandible	inferior aspect of tongue; body of hyoid bone	hypoglossal nerve	protracts tongue (‘sticking out tongue’)
Hyoglossus	body / greater horn of hyoid bone	inferolateral tongue	hypoglossal nerve	depresses tongue
Styloglossus	styloid process of temporal bone	inferolateral tongue	hypoglossal nerve	retracts / elevates tongue

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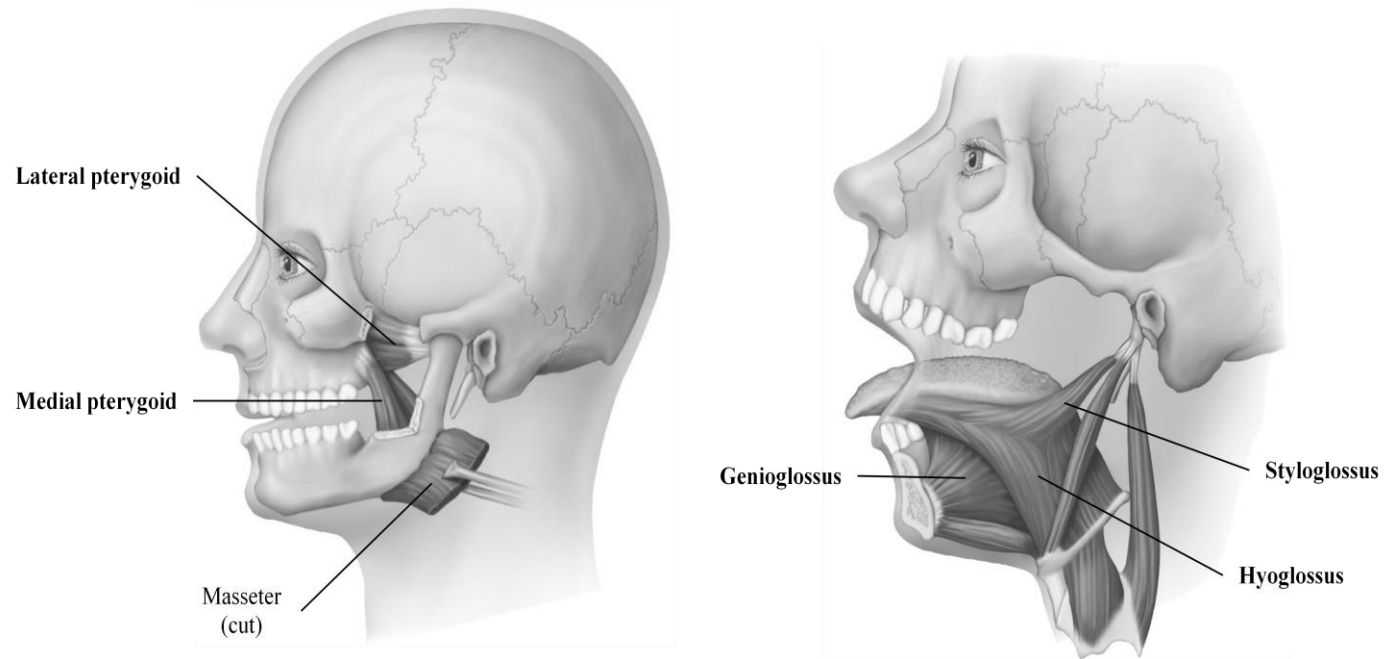


Figure 2: Muscles promoting mastication and tongue movement (note: masseter and temporalis not shown)

NECK MUSCULATURE

The muscles of the neck are primarily responsible for the movement of the head and the act of swallowing / speaking.

Muscles Promoting Head Movement (Marieb / Hoehn – Chapter 10; Pgs. 336 – 337; Figure 3)

MUSCLE:	ORIGIN:	INSERTION:	INNERVATION:	ACTION:
Sternocleidomastoid*	medial portion of clavicle; manubrium of sternum	mastoid process of temporal bone; occipital bone	accessory nerve (cranial nerve XI)	flexes / laterally rotates head
Scalenes*	transverse processes of vertebrae C ₂ – C ₆	anteriolateral surface of first two ribs	----- (spinal nerves)	flexes / laterally rotates neck; elevates ribs
Splenius* (capitis / cervicis)	spinous processes of vertebrae C ₇ – T ₆	transverse processes of vertebrae C ₂ – C ₄ ; mastoid process of temporal bone	----- (spinal nerves)	extends / laterally rotates head

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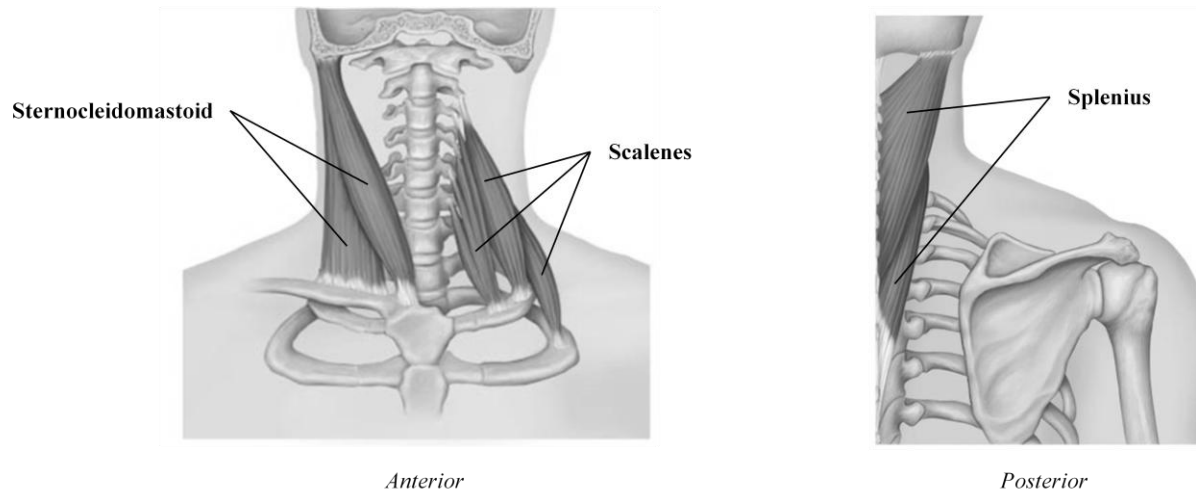


Figure 3: Muscles promoting head movement

Muscles Promoting Swallowing / Speaking (Marieb / Hoehn – Chapter 10; Pgs. 334 – 335; Figure 3)

MUSCLE:	ORIGIN:	INSERTION:	INNERVATION:	ACTION:
Digastric*	lower margin of mandible; mastoid process of temporal bone	hyoid bone (connective tissue loop)	trigeminal nerve (cranial nerve V)	elevates hyoid bone; depresses mandible
Stylohyoid	styloid process of temporal bone	hyoid bone	facial nerve (cranial nerve VII)	elevates / retracts hyoid
Mylohyoid*	medial inner surface of mandible	hyoid bone	trigeminal nerve (cranial nerve V)	elevates hyoid bone; elevates floor of mouth
Geniohyoid	medial inner surface of mandible	hyoid bone	hypoglossal nerve (cranial nerve XII)	elevates hyoid bone; pulls hyoid bone anteriorly
Sternohyoid*	manubrium of sternum; medial end of clavicle	lower margin of hyoid bone	----- (spinal nerves)	depresses hyoid bone
Sternothyroid*	posterior surface of manubrium of sternum	thyroid cartilage of larynx	----- (spinal nerves)	depresses hyoid bone; depresses larynx
Omohyoid*	superior surface of scapula	lower margin of hyoid bone	----- (spinal nerves)	depresses / retracts hyoid bone
Thyrohyoid*	thyroid cartilage of larynx	hyoid bone	hypoglossal nerve (cranial nerve XII)	depresses hyoid bone; elevates larynx

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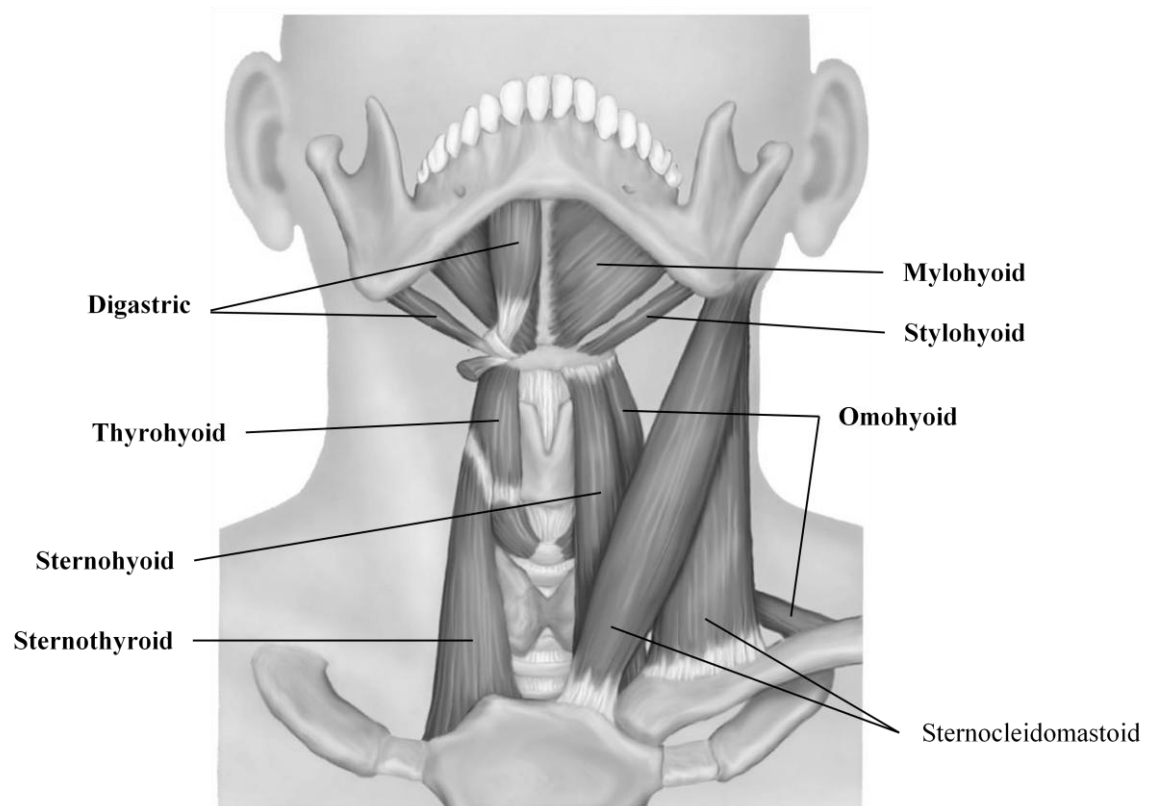


Figure 4: Muscles involved in swallowing and speaking, anterior view (note: genioid not shown)

TRUNK MUSCULATURE

The trunk musculature includes muscles that move the vertebral column, muscles that move the ribs for breathing, and muscles that form the major structural portion of the abdominal body wall and floor.

Muscles Promoting Trunk Extension (Marieb / Hoehn – Chapter 10; Pgs. 338 – 339; Figure 5)

MUSCLE:	ORIGIN:	INSERTION:	INNERVATION:	ACTION:
Iliocostalis* (part of Erector spinae)	iliac crest of os coxa; ribs 3 – 12	angles of ribs; transverse processes of vertebrae C ₄ – C ₆	----- (spinal nerves)	extends / laterally flexes vertebral column
Longissimus* (part of Erector spinae)	transverse processes of C ₁ – L ₅ vertebrae	transverse processes of thoracic through cervical vertebrae; multiple ribs	----- (spinal nerves)	extends / laterally flexes vertebral column
Spinalis* (part of Erector spinae)	spinous process of upper lumbar and lower thoracic vertebrae	spinous process of upper thoracic and cervical vertebrae	----- (spinal nerves)	extends vertebral column
Semispinalis	transverse processes of C ₇ – T ₁₂	spinous processes of cervical and thoracic vertebrae	----- (spinal nerves)	extends vertebral column
Quadratus lumborum	iliac crest of os coxa	transverse processes of vertebrae L ₁ – L ₄ ; lower margin of rib 12	----- (spinal nerves)	laterally flexes vertebral column

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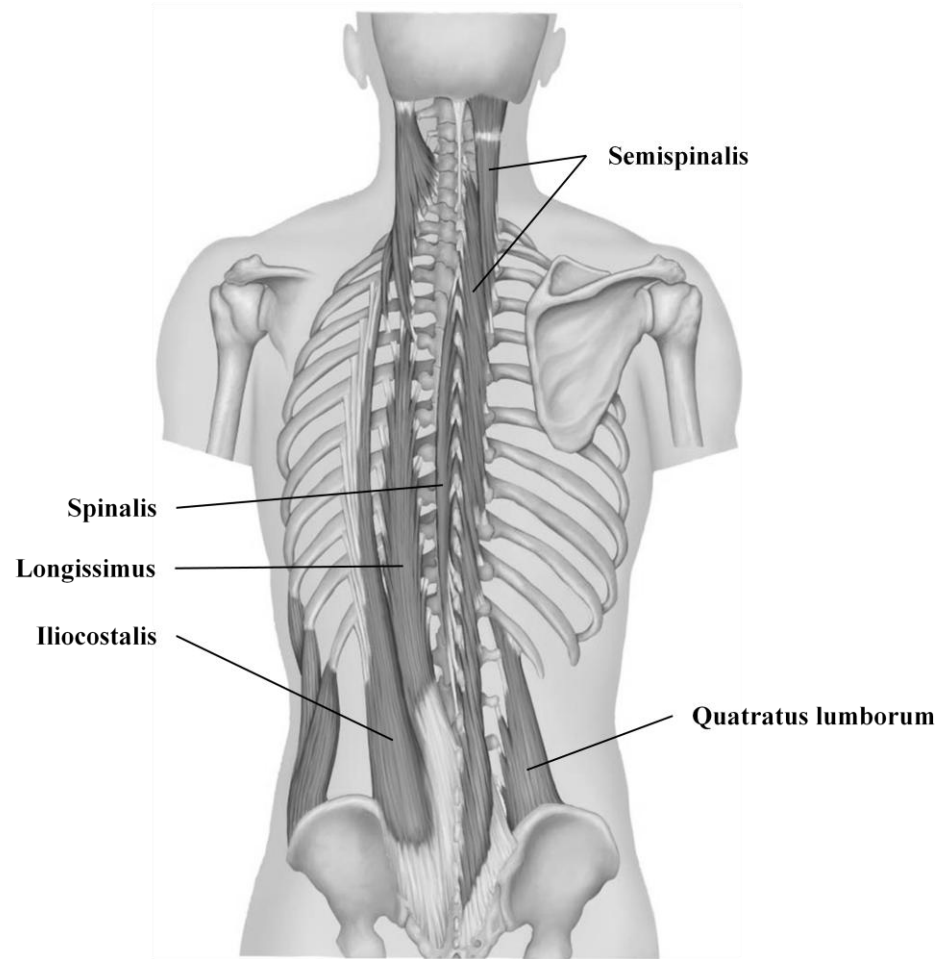


Figure 5: Muscles involved in trunk extension

Muscles Promoting Breathing (Marieb / Hoehn – Chapter 10; Pgs. 340 – 341; Figure 6)

MUSCLE:	ORIGIN:	INSERTION:	INNERVATION:	ACTION:
External intercostals*	inferior border of rib above	superior border of rib below	----- (spinal nerves)	elevates rib cage
Internal intercostals*	superior border of rib below	inferior border of rib above	----- (spinal nerves)	depresses rib cage
Diaphragm*	inferior internal surface of rib cage / sternum; lumbar vertebrae	central tendon of diaphragm	phrenic nerves	expands thoracic cavity

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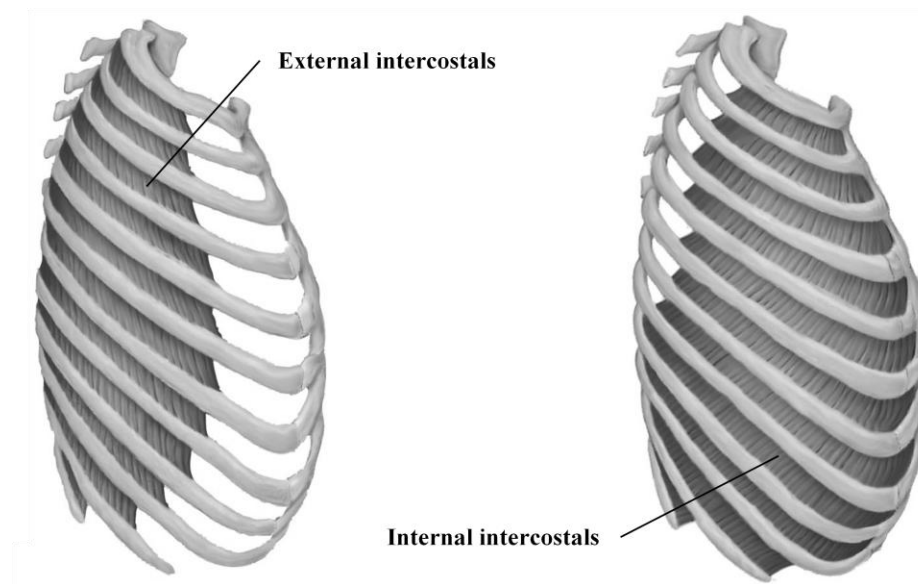


Figure 6: Muscles of respiration (note: diaphragm not shown)

Muscles Promoting Movement / Compression of Abdominal Wall (Marieb / Hoehn – Chapter 10; Pgs. 342 – 343; Figure 7)

MUSCLE:	ORIGIN:	INSERTION:	INNERVATION:	ACTION:
Rectus abdominis*	pubic crest of os coxa	xiphoid process of sternum; costal cartilage of ribs 5 – 7	----- (spinal nerves)	flexes / rotates lumbar region of vertebral column
External oblique*	outer surface of ribs 4 – 12	linea alba	----- (spinal nerves)	flexes / rotates vertebral column; compresses abdominal wall
Internal oblique*	iliac crest of os coxa	linea alba; pubic crest of os coxa; ribs 9 – 12	----- (spinal nerves)	flexes / rotates vertebral column; compresses abdominal wall
Transversus abdominis*	lumbar vertebrae; ribs 7 – 12; iliac crest of os coxa	linea alba / pubic crest of os coxa	----- (spinal nerves)	compresses abdominal wall

Muscles Promoting Pelvic Floor Support (Marieb / Hoehn – Chapter 10; Pgs. 344 – 345; Figure 8)

MUSCLE:	ORIGIN:	INSERTION:	INNERVATION:	ACTION:
Levator ani	inner pelvis from pubis to ischial spine	inner surface of coccyx	----- (spinal nerves)	supports / maintains position of pelvic viscera
Coccygeus	spine of ischium	sacrum; coccyx	----- (spinal nerves)	supports pelvic viscera

* Need to be familiar with on both ADAM and the human cadaver

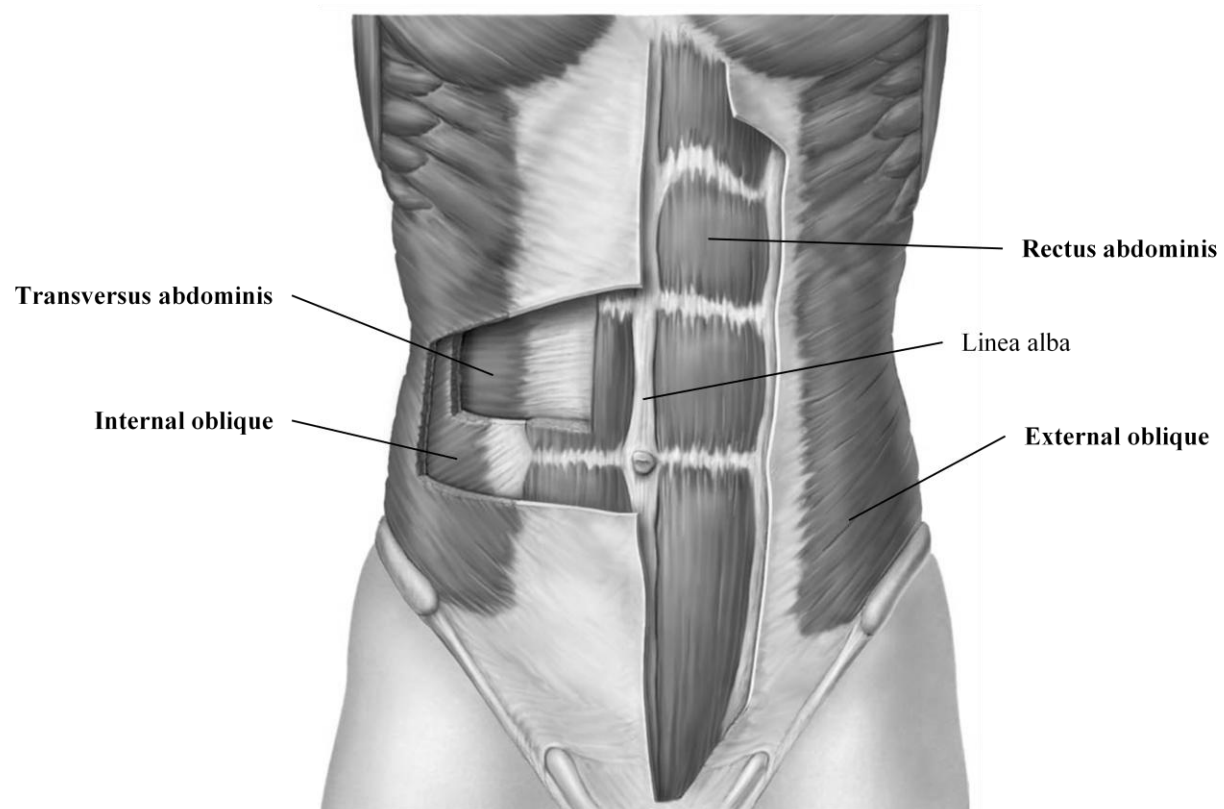


Figure 7: Muscles of the abdominal wall, anterior view.

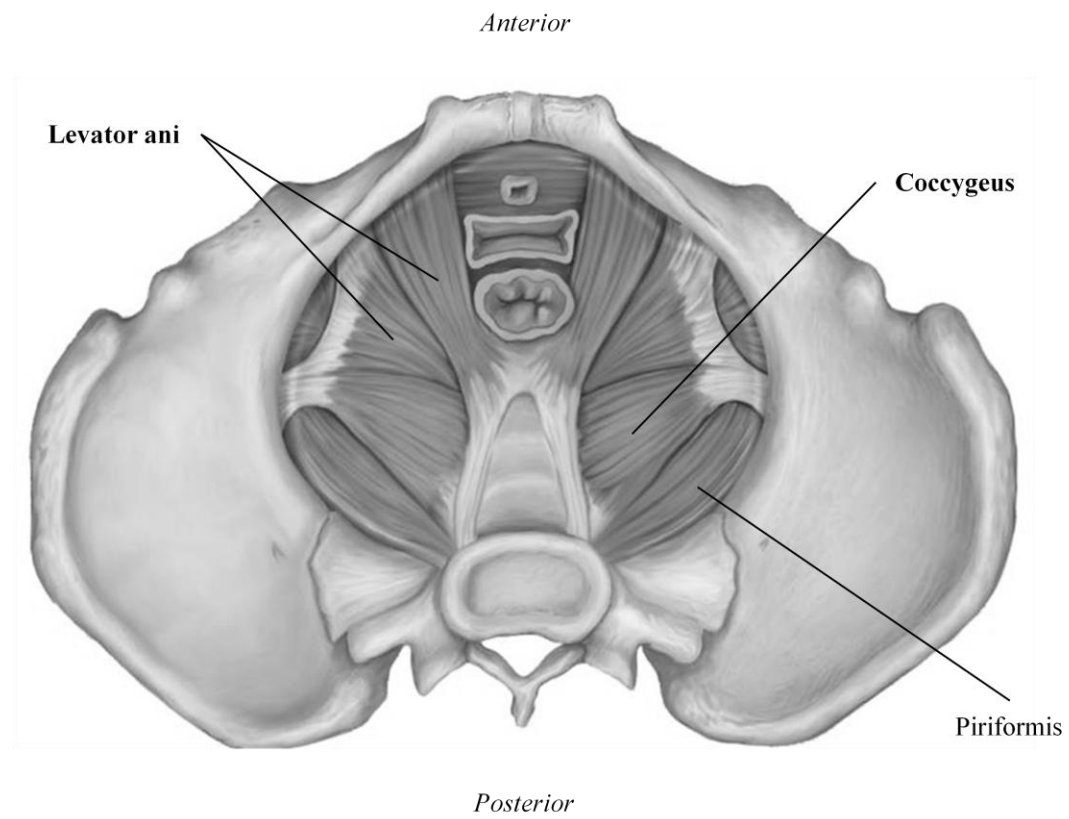


Figure 8: Muscles of the pelvic floor, superior view.