

MUSCLES OF THE HEAD AND NECK



Myology



Types of Muscles

Skeletal striated muscle

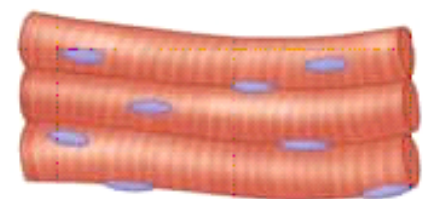
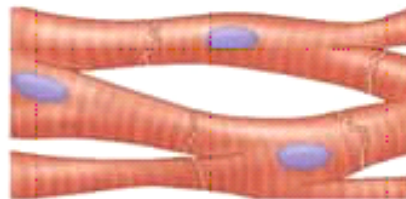
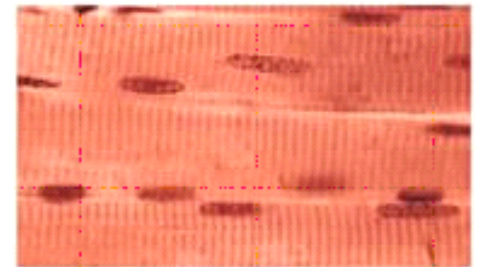
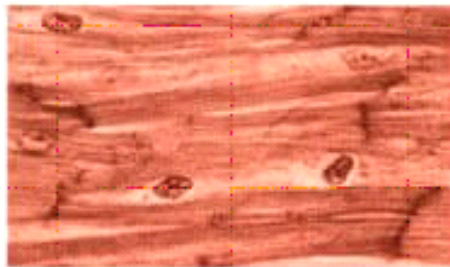
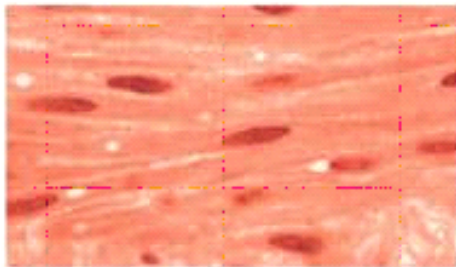
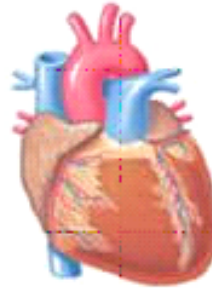
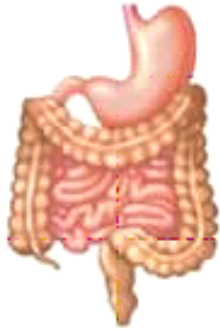
- voluntary somatic muscle
- make up the skeletal muscles

Cardiac striated muscle

- involuntary visceral muscle
- forms most of the walls of the heart and adjacent parts of the great vessels

Smooth muscle (unstriated)

- involuntary visceral muscle
 - forms part of the walls of most vessels and hollow organs
- 



Smooth muscle

- has narrow, tapered rod-shaped cells
- has nonstriated, uninucleated fibers
- occurs in walls of internal organs and blood vessels
- is involuntary

Cardiac muscle

- has striated, tubular, branched, uninucleated fibers
- occurs in walls of heart
- is involuntary

Skeletal muscle

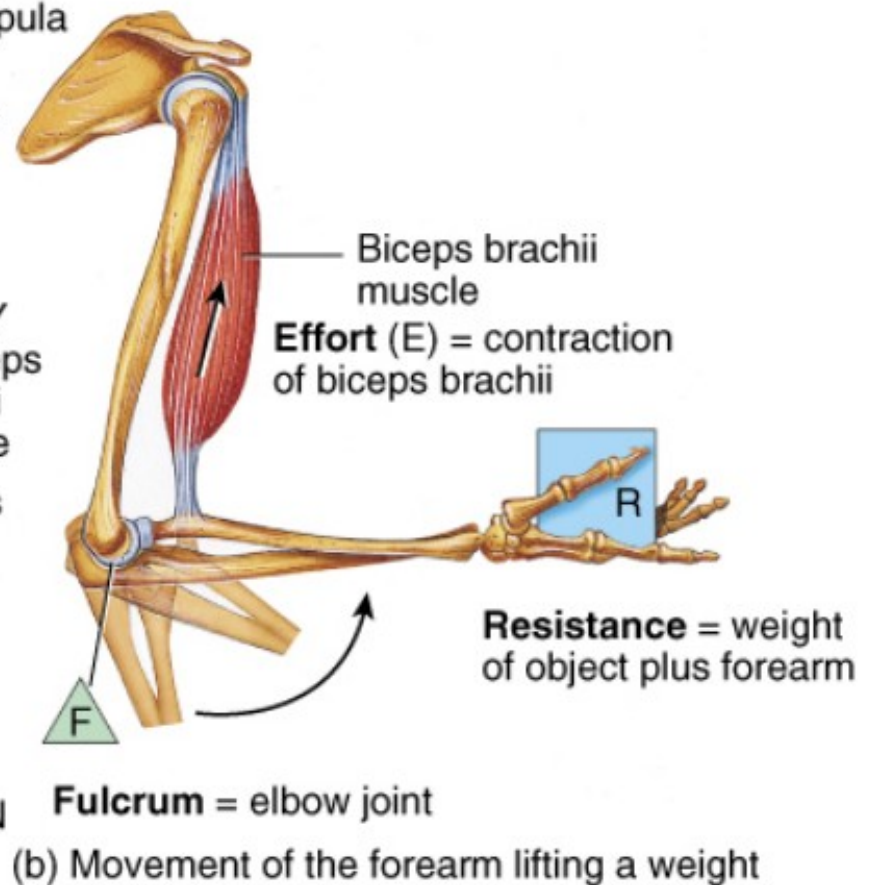
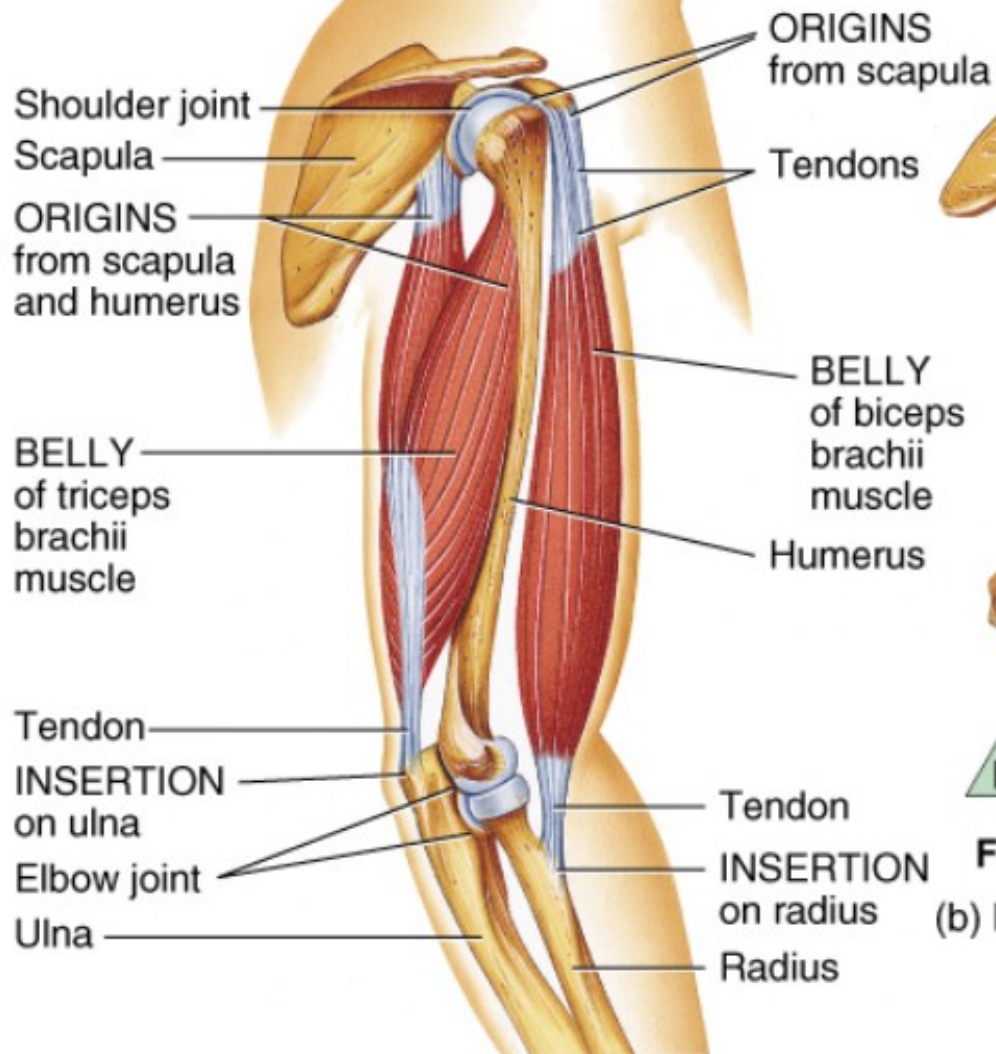
- has striated, tubular, multinucleated fibers
- is usually attached to skeleton
- is voluntary

Muscle attachment sites

- **Tendon** - attachment site to bones
- **Origin** - relatively fixed during muscular contraction (generally a more proximal location)
- **Insertion** - moveable during the contraction
- **Belly** - fleshy portion of the muscle in between attachment sites

Connective tissues

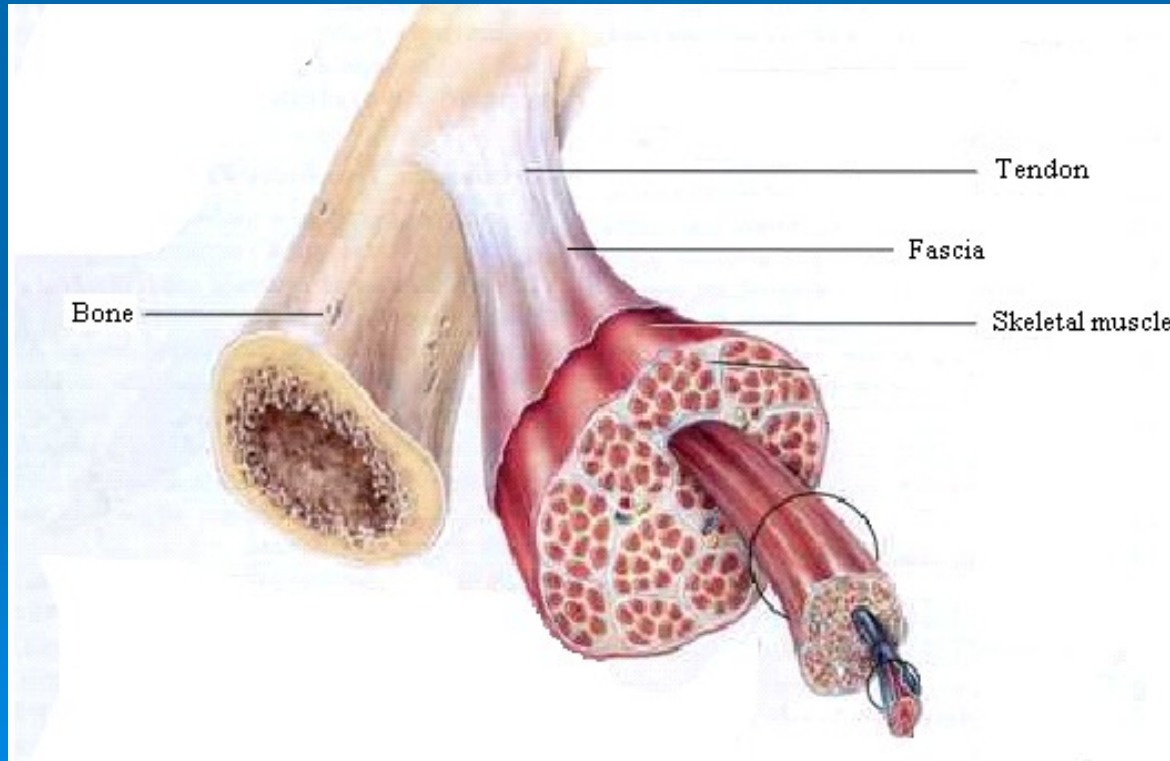
- **Ligament** - fibrous tissue that connects bones to other bones
- **Aponeurosis** - layer of flat broad tendon
- **Tendon** - tough band of fibrous connective tissue that usually connects the muscle to bone



DANK

Fascia

- layer of fibrous tissue that surrounds muscles, groups of muscles, blood vessels and nerves, binding those structures together
- allow the muscles to slide upon each other during movement



Arrangement of Fascicles

Parallel Fascicles parallel to longitudinal axis of muscle; terminate at either end in flat tendons.



Example: Stylohyoid muscle (see Figure 11.7)

Fusiform Fascicles nearly parallel to longitudinal axis of muscle; terminate in flat tendons; muscle tapers toward tendons, where diameter is less than at belly.



Example: Digastric muscle (see Figure 11.7)

Circular Fascicles in concentric circular arrangements form sphincter muscles that enclose an orifice (opening).



Example: Orbicularis oculi muscle (see Figure 11.3)

Triangular Fascicles spread over broad area converge at thick central tendon; give muscle a triangular appearance.



Example: Pectoralis major muscle (see Figure 11.2a)

Pennate Short fascicles in relation to total muscle length; tendon extends nearly entire length of muscle.

Unipennate Fascicles are arranged on only one side of tendon.



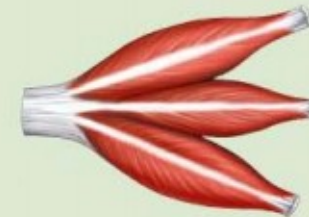
Example: Extensor digitorum longus muscle (see Figure 11.20a,b)

Bipennate Fascicles are arranged on both sides of centrally positioned tendons.



Example: Rectus femoris muscle (see Figure 11.19a)

Multipennate Fascicles attach obliquely from many directions to several tendons.



Example: Deltoid muscle (see Figure 11.9a)

Coordination among muscles

- body movements are often the result of multiple muscles working groups
- **Agonist or prime mover**
doing the contracting and creating the movement
- **Antagonist**
is relaxing and letting the movement take place
- **Synergist**
support the agonist in creating movement
- **Fixator**
allows the agonist to work, stabilizing the origin

Muscles of the Head





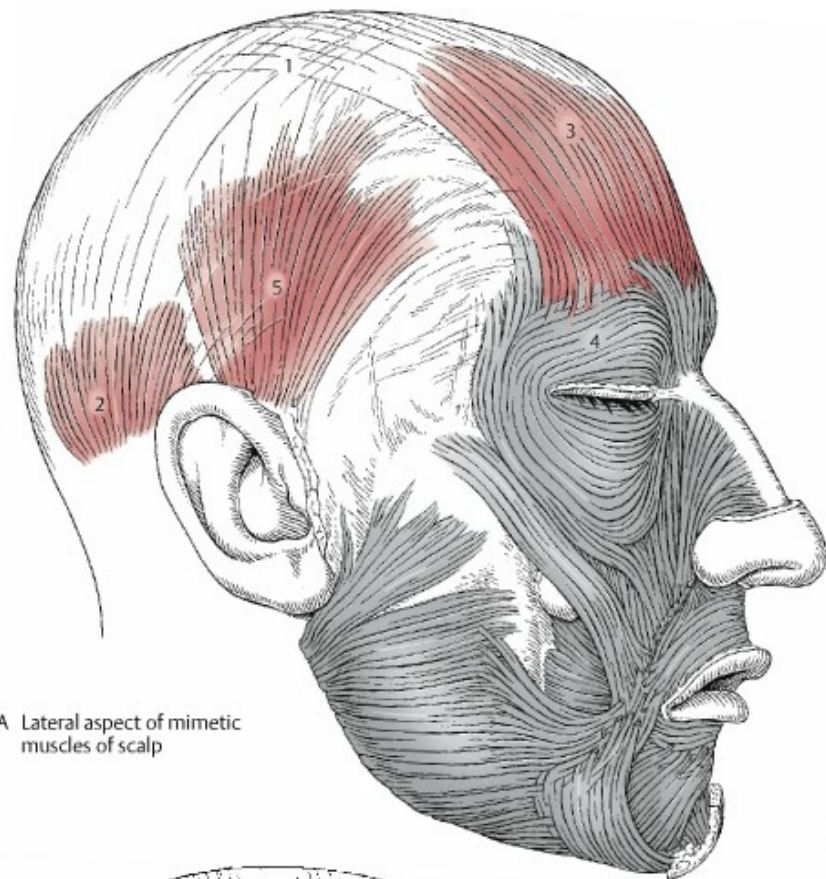
Muscles of eye	Origin	Insertion	Action	Innervation
M. orbicularis oculi pars palpebralis and orbitalis	circularly around the orbit, is attached to ligamentum palpebrale mediale		closing the eyelid	N.facialis
M. orbicularis oculi pars lacrimalis	crista lacrimalis posterior	margins of the eye-lids	enlarges saccus lacrimalis	
M. corrugator supercilii	sutura nasofrontalis	middle and lateral part of the eyebrows	vertical furrowing over radix nasi	
M. procerus	radix nasi	glabella	transversal skin folds above radix nasi	

Muscles of the mouth	Origin	Insertion	Action	Innervation
M. orbicularis oris	juga alveolaria of incisors, inferior part of apertura piriformis	labial skin	mouth closing, labial constriction, labial puckering	N.facialis
M. levator labii superioris	inferior edge of aditus orbitae	labium superius	elevation of upper lip	
M. levator labii superioris alaeque nasi	angulus medialis orbitae et dorsum nasi	sulcus nasolabialis	elevation of upper lip and enlargement of nostril	
M. levator anguli oris	fossa canina	angulus oris	elevates angulus oris	
M. zygomaticus minor	os zygomaticum	sulcus nasolabialis	pulls angulus oris laterocranially	
M. zygomaticus major	os zygomaticum	sulcus nasolabialis	pulls oral angle laterocranially	

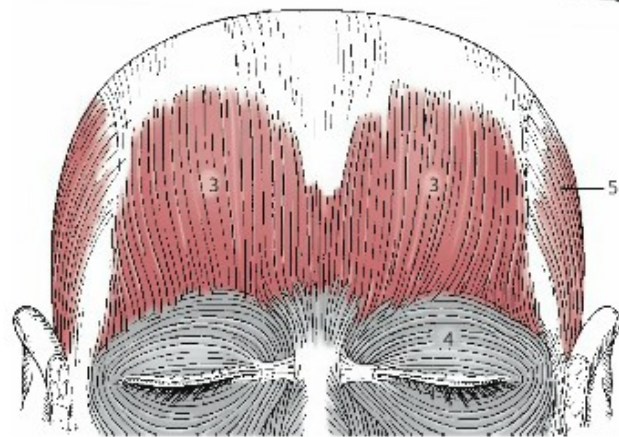
Muscles of the mouth	Origin	Insertion	Action	Innervation
M. risorius	fascia masseterica	angulus oris	traction of oral angle laterocranially	N.facialis
M. buccinator	processus alveolaris of the posterior teeth et raphe buccopharyngeum	angulus oris	compresses cheeks against molar teeth; sucking and blowing	
M. depressor anguli oris	basis mandibulae	angulus oris	traction of angulus oris caudally	
M. depressor labii inferioris	basis mandibulae	labium inferius	traction of lower lip caudally	
M. mentalis	juga alveolaria of lower incisors	skin of the chin	pulls chin skin cranially, protrudes lower lip	

Muscles of epicranium	Origin	Insertion	Action	Innervation
M. occipitofrontalis venter occipitalis	linea nuchae suprema	galea aponeurotica	traction of the head skin dorsally, and erases forehead wrinkles	N.facialis
M. occipitofrontalis venter frontalis	margo anterior of galea aponeurotica	skin of forehead and eyebrow	contraction causes transversal forehead wrinkles, and elevation of palpebra superior	
M. temporoparietalis	galea aponeurotica	auricular cartilage	pulls auricula cranially	

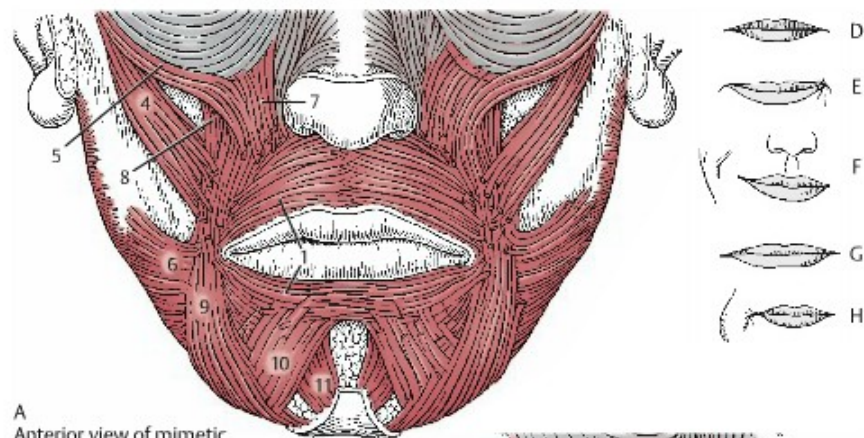
Nasal muscle	Origin	Insertion	Action	Innervation
M. nasalis	juga alveolaria of the upper anterior teeth	ala nasi	narrowing of nostril	N.facialis



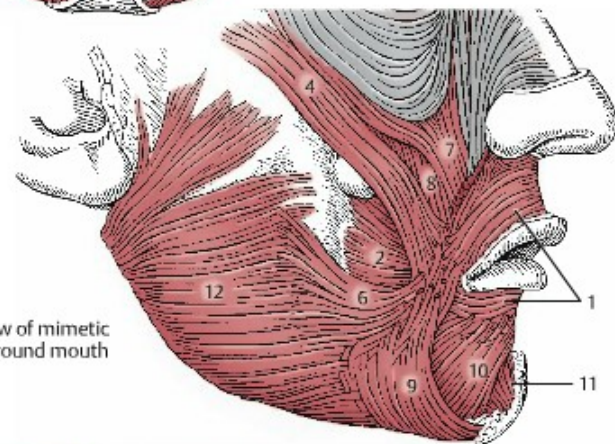
A Lateral aspect of mimetic muscles of scalp



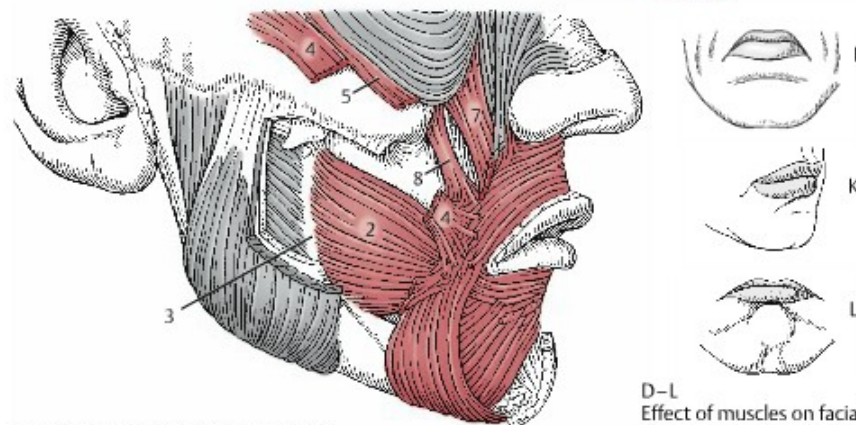
B Anterior aspect of mimetic muscles of forehead



A Anterior view of mimetic muscles around mouth



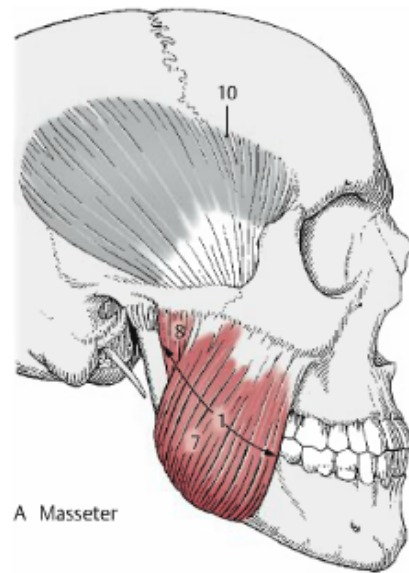
B Lateral view of mimetic muscles around mouth



C Detailed lateral view of buccinator

D-L Effect of muscles on facial expression (from Rouille)

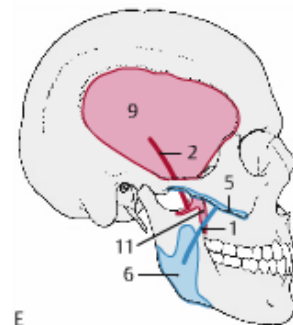
Masticatory muscles	Origin	Insertion	Action	Innervation
M. temporalis	planum temporale (as far as linea temporalis inf.) and internal surface of temporal fascia	processus coronoideus mandibulae	elevation and retrusion	N.trigeminus
M. masseter pars superficialis	corpus ossis zygomatici et arcus zygomaticus (anterior ⅔)	tuberositas masseterica	elevation and protrusion	
M. masseter pars profunda	arcus zygomaticus (posterior ⅓)	external surface of ramus mandibulae	retrusion	
M. pterygoideus medialis pars medialis	fossa pterygoidea	tuberositas pterygoidea	elevation	
M. pterygoideus medialis pars lateralis	tuber maxillae	tuberositas pterygoidea		
M. pterygoideus lateralis pars superior	facies infratemporalis alae majoris ossis sphenoidalis	discus articularis et fovea pterygoidea	protrusion and depression	
M. pterygoideus lateralis pars inferior	lateralis processus pterygoidei	discus articularis et fovea pterygoidea		



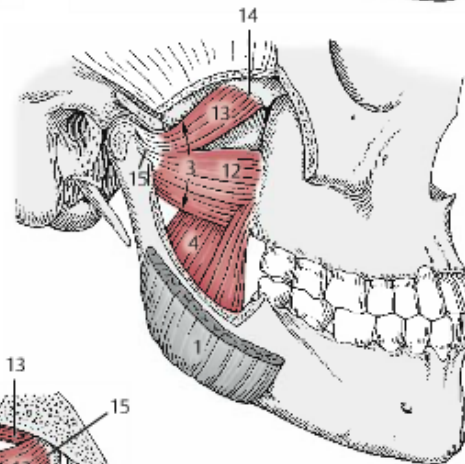
A Masseter



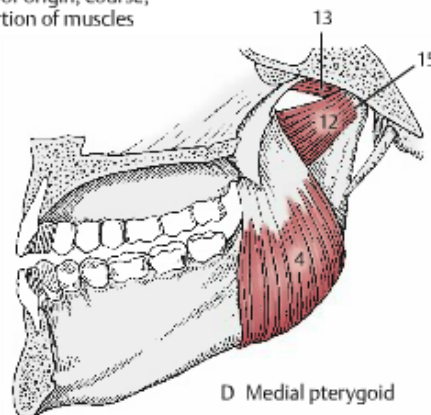
B Temporalis



E
Diagram of origin, course,
and insertion of muscles



C Lateral and medial pterygoid



D Medial pterygoid

Muscles of the Neck

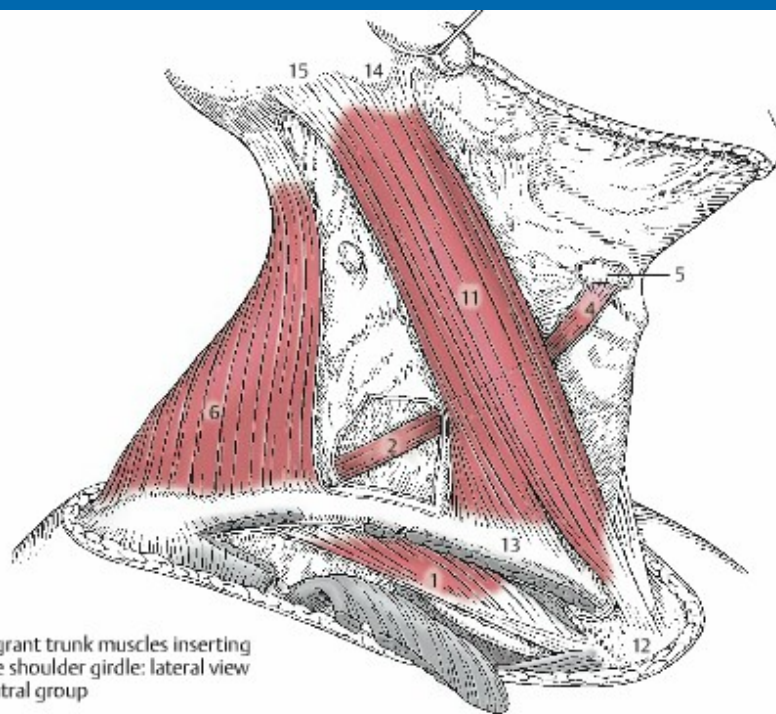


Superficial muscles	Origin	Insertion	Action	Innervation
M. platysma	fascia pectoralis et deltoidea	skin over basis mandibulae	stretches cervical skin	n. facialis - cervical branch
M. sternocleidomastoideus	manubrium sterni et clavicula (medial $\frac{1}{3}$)	processus mastoideus et linea nuchae superior	bilateral: dorsiflexion of the head and neck; unilateral: lateroflexion of the head and neck; auxiliary inspiratory m.	n. accessorius, plexus cervicalis

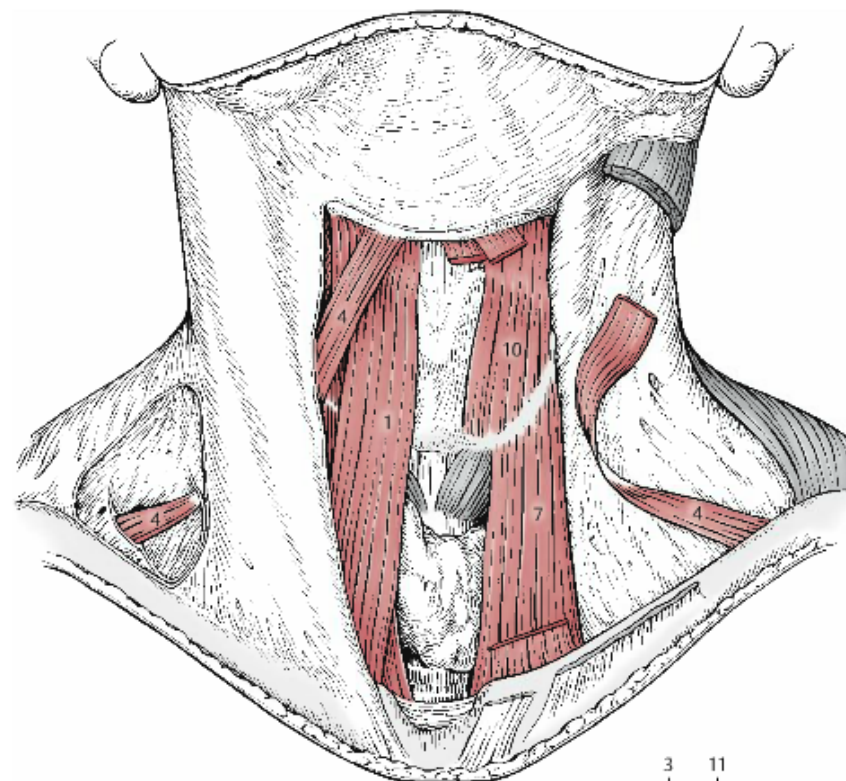
Scalene muscles	Origin	Insertion	Action	Innervation
M. scalenus anterior and medius	processus transversi of cervical vertebrae	first rib	unilateral: lateroflexion and rotation of neck; bilateral: flexes neck; auxiliary inspiratory muscles	Plexus cervicalis
M. scalenus posterior	processus transversi of cervical vertebrae	second rib		

Suprahyoid muscles	Origin	Insertion	Action	Innervation
M. mylohyoideus	linea mylohyoidea	corpus ossis hyoidei et raphe mylohyoidea	mandibular depression; fixed mandible: elevates the hyoid bone	n. mylohyoideus
M. digastricus venter posterior	incisura mastoidea	os hyoideum	fixed mandible: elevation of the hyoid bone	r. digastricus n. facialis
M. digastricus venter anterior	os hyoideum	fossa digastrica	fixed hyoid bone: mandibular depression; fixed mandible: elevation of the hyoid bone	n. mylohyoideus
M. stylohyoideus	processus styloideus	os hyoideum	elevates the hyoid bone and pulls it dorsally	n. facialis
M. geniohyoideus	spina mandibulae	os hyoideum	mandibular depression; fixed mandible: elevation of the hyoid bone	brach from C1 and C2

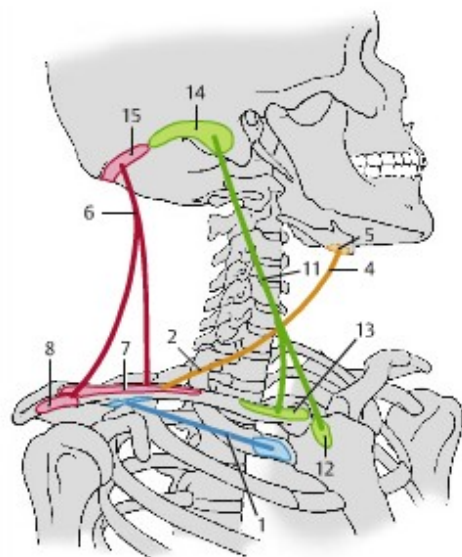
Infrahyoid muscles	Origin	Insertion	Action	Innervation
M. sternohyoideus	manubrium sterni et art. sternoclavicularis	os hyoideum	depresses of hyoid bone and larynx	Plexus cervicalis
M. sternothyroideus	manubrium sterni et first rib	cartilago thyroidea (linea obliqua)	depresses larynx	
M. thyrohyoideus	cartilago thyroidea (linea obliqua)	lateral part of body and greater horn of hyoid bone	depresses of hyoid bone	
M. omohyoideus venter inferior	margo superior scapulae (area nearby ligamentum transversum scapulae)	intermediate tendon	depresses of hyoid bone and larynx	
M. omohyoideus venter superior	intermediate tendon	os hyoideum		



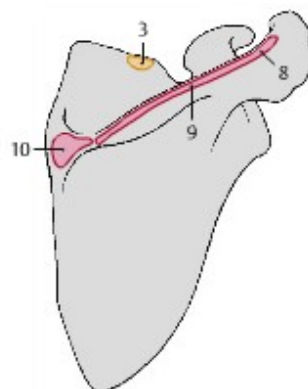
A Immigrant trunk muscles inserting on the shoulder girdle: lateral view of ventral group



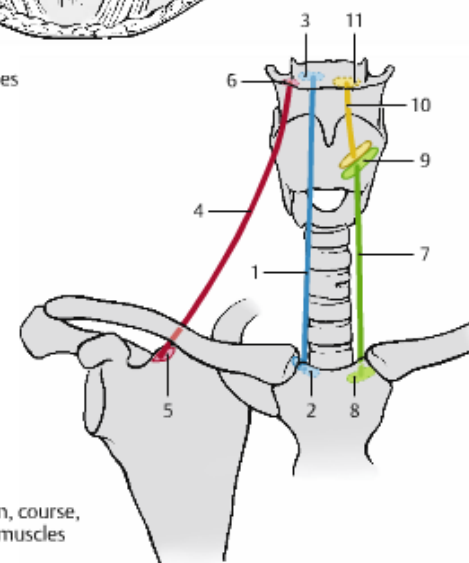
A Infrahyoid muscles



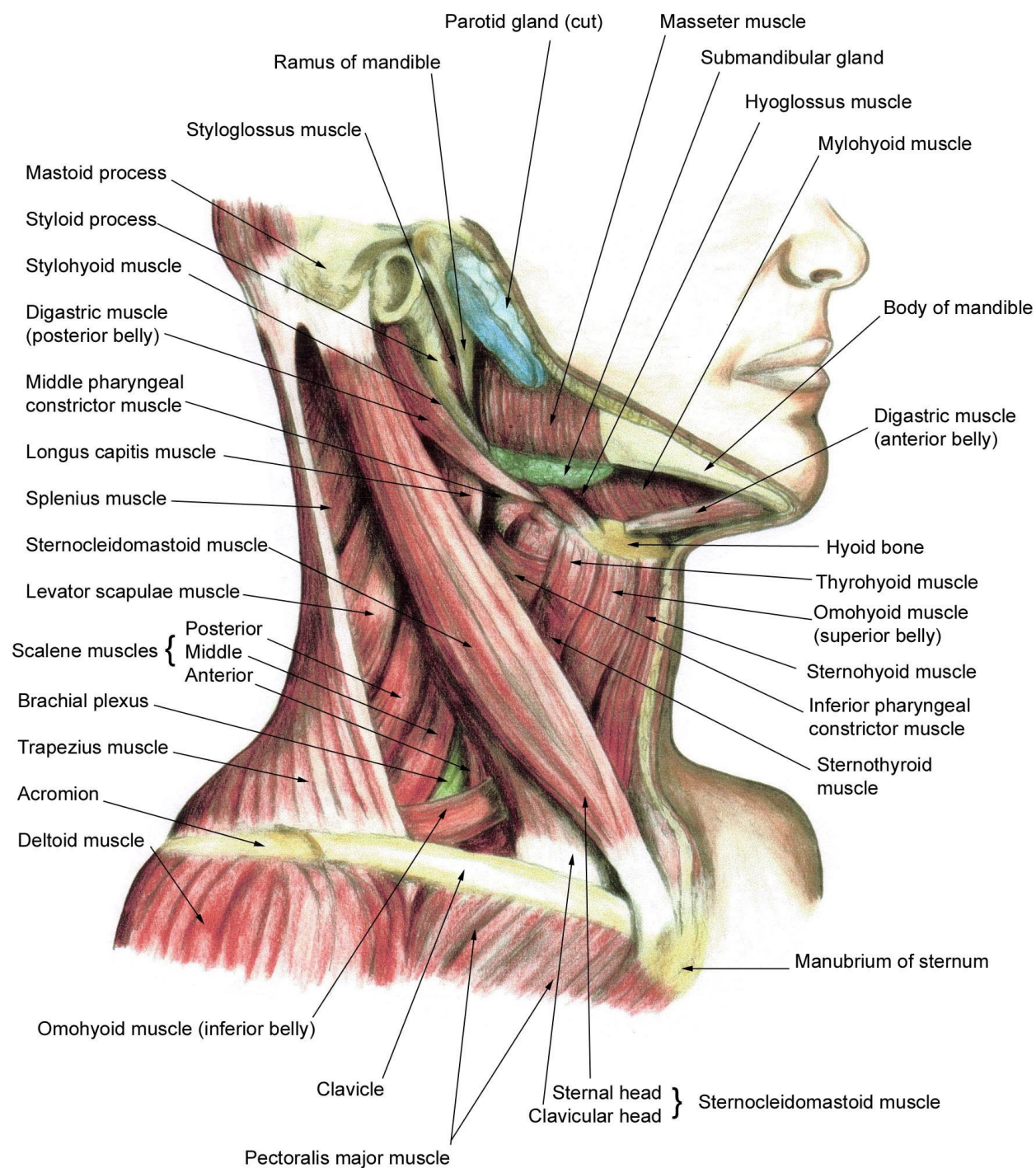
B Diagram of origin, course, and insertion of muscles



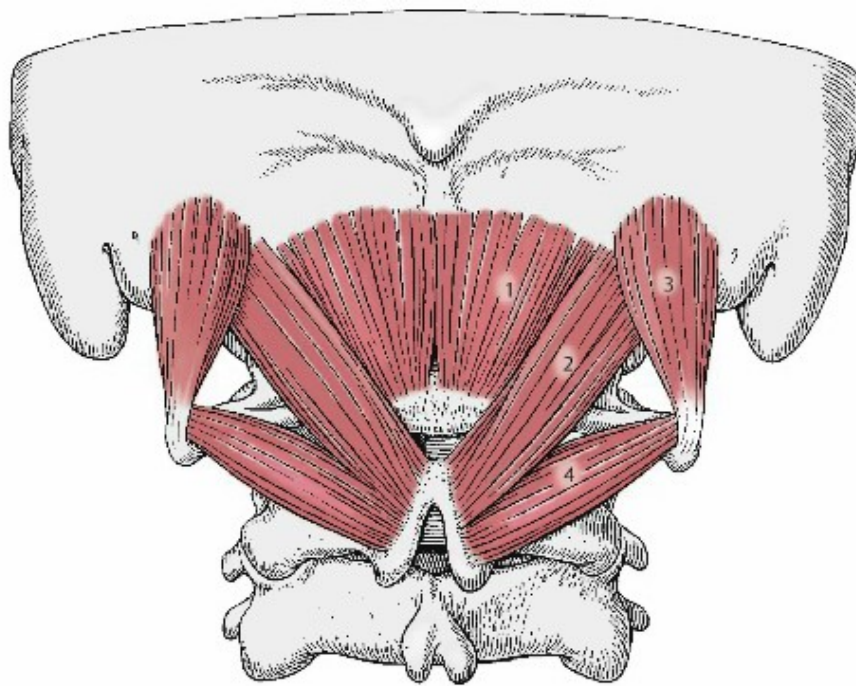
C Diagram of attachment of muscles to scapula



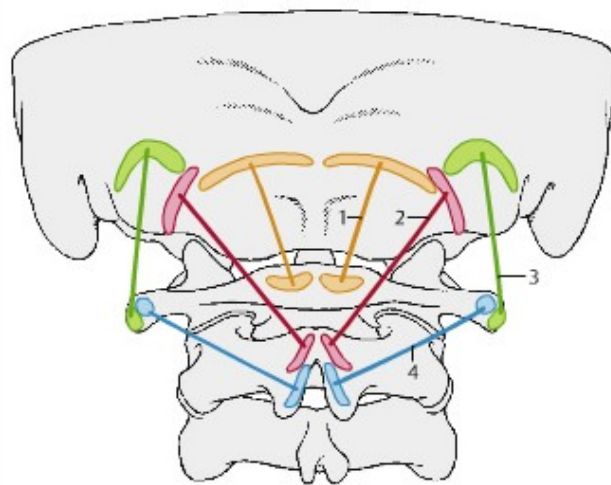
B Diagram of origin, course, and insertion of muscles



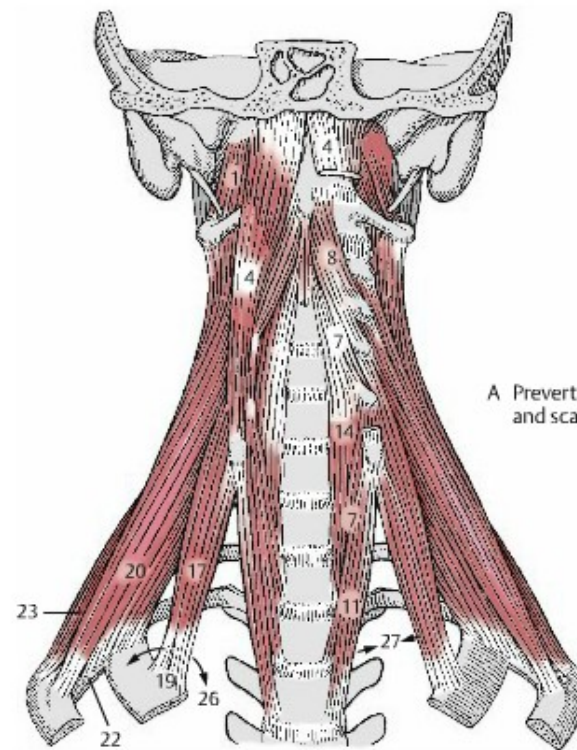
Prevertebral muscles	Origin	Insertion	Action	Innervation
M. longus colli	The muscle is located in front of body and transverse processes of cervical vertebrae		unilateral: lateroflexion of the head and neck; bilateral: flexes head and neck	Plexus cervicalis
M. longus capitis	processus transversi of cervical vertebrae	pars basilaris ossis occipitalis	unilateral: lateroflexion of the head and neck; bilateral: flexes head and neck	
M. rectus capitis anterior	processus transversi of atlas	pars basilaris ossis occipitalis	unilateral: lateroflexion of the head and neck; bilateral: flexes head and neck	
M. rectus capitis lateralis	processus transversi of atlas	pars basilaris ossis occipitalis	unilateral: lateroflexion of the head and neck; bilateral: flexes head and neck	



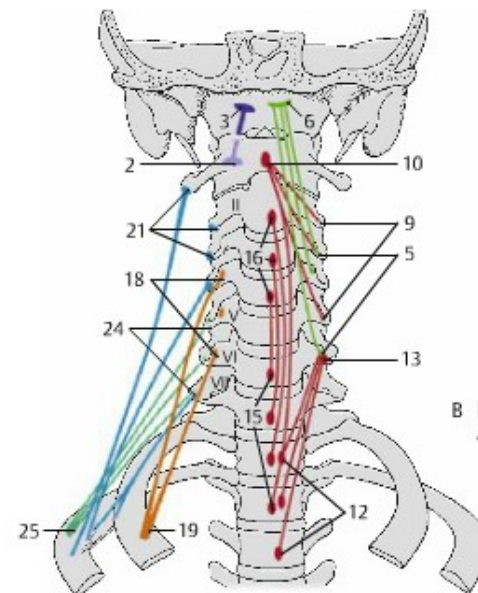
A Suboccipital muscles



B Diagram of origin, course, and insertion of muscles



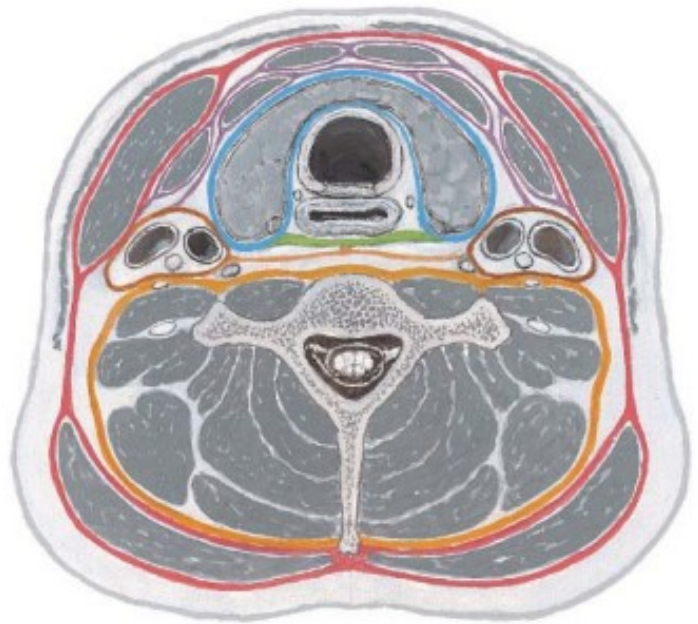
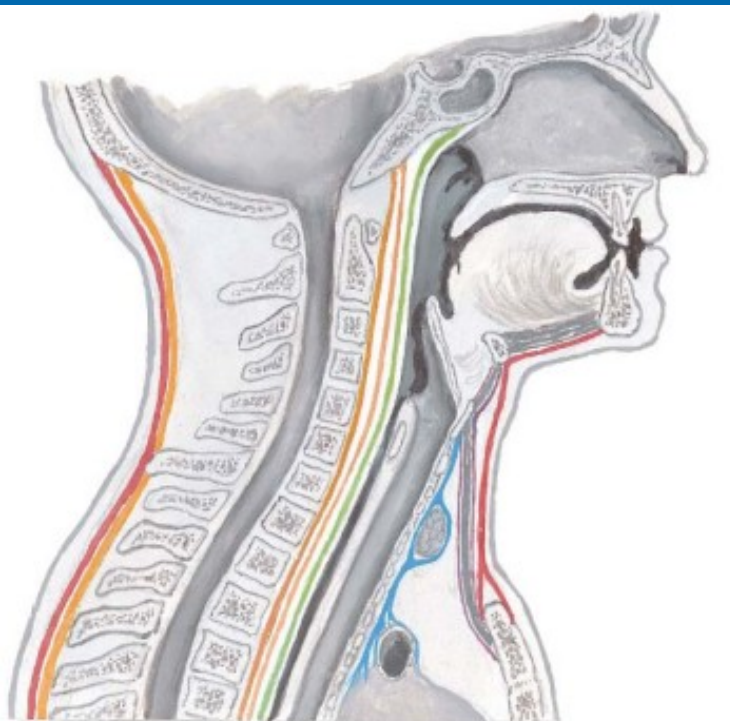
A Prevertebral and scalene muscles



B Diagram of origin, course, and insertion of muscles

Cervical Fascias





- **Superficial fascia**
immediately deep to the skin
- **Deep cervical fascia**
deep investing fascia
visceral (pretracheal) fascia
prevertebral fascia
alar fascia

Deep investing fascia

- wraps around the entire circumference of the neck
- splits to pass around SCM and trapezius
- **Superior attachment**
inf. border of mandible, inf. border of the body of hyoid bone, angle of mandible, inf. border of zygomatic arch, mastoid process, styloid process and attachments of SCM and trapezius to the skull
- **Inferior attachment**
manubrium sterni, clavicles and spine of the scapula

Visceral/pretracheal fascia

- deep to the deep investing fascia
- forms a sheath around the visceral unit of the neck
- **Superior attachment**
hyoid bone and base of the skull
- **Inferior attachment**
superior mediastinum → pericardium of the heart



Prevertebral fascia

- surrounds the cervical vertebral unit
- **Superior attachment**
base of the skull
- **Inferior attachment**
blends with the investing fascia of the musculature of the back and with the anterior longitudinal ligament of the thoracic vertebrae

Alar fascia

- formed by a division of the anterior component of the prevertebral fascia
- binds to the transverse processes laterally