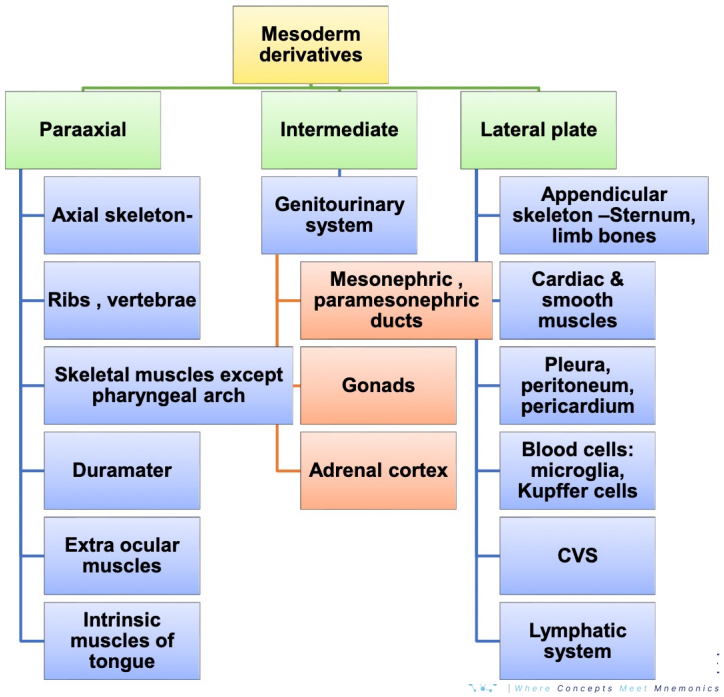
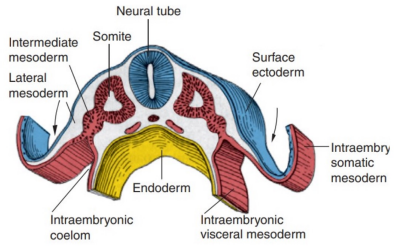
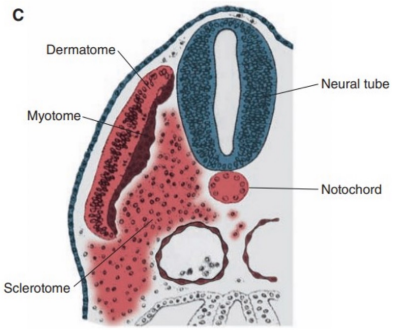
ANATOMY BINGE REVISION

Medsynapse by Dr. Nikita







Ectoderm

Epidermis, hair, nails, sweat and sebaceous glands
Utricle, semicircular ducts, vestibular ganglion of CN VIII
Saccule, cochlear duct (organ of Corti), spiral ganglion of CN VIII
Olfactory placode, CN I
Ameloblasts (enamel of teeth)
Adenohypophysis
Lens of eye
Anterior epithelium of cornea
Acinar cells of parotid gland
Acinar cells of mammary gland

Epithelial lining of:
- Lower anal canal
- Distal part of male urethra
- External auditory meatus

Mesoderm

Muscle (smooth, cardiac, skeletal)
Extraocular muscles, ciliary muscle of eye, iris stroma, ciliary body stroma
Substantia propria of cornea, corneal endothelium, sclera, choroid
Muscles of tongue (occipital somites)
Pharyngeal arch muscles
Laryngeal cartilages
Connective tissue
Dermis and subcutaneous layer of skin
Bone and cartilage
Dura mater
Endothelium of blood and lymph vessels
Red blood cells, white blood cells, microglia, and Kupffer cells
Spleen
Kidney
Adrenal cortex
Testes, epididymis, ductus deferens, seminal vesicle, ejaculatory duct
Ovary, uterus, uterine tubes, superior 1/3 of vagina

Endoderm

Hepatocytes
Principal and oxyphil cells of parathyroid
Thyroid follicular cells thymus
Epithelial reticular cells of thymus
Acinar and islet cells of pancreas
Acinar cells of submandibular and sublingual glands
Epithelial lining of:
- Gastrointestinal tract
- Trachea, bronchii, lungs
- Biliary apparatus
- Urinary bladder, female urethra, most of male urethra
- Inferior 2/3 of vagina
- Auditory tube, middle ear cavity
- Crypts of palatine tonsils

Neuroectoderm

All neurons within brain and spinal cord
Retina, iris epithelium, ciliary body epithelium, optic nerve (CN II), optic chiasm, optic tract, dilator and sphincter pupillae muscles
Astrocytes, oligodendrocytes, ependymocytes, tanycytes, choroid plexus cells
Neurohypophysis
Pineal gland

Neural Crest

Cranial neural crest cells:
- Pharyngeal arch skeletal and connective tissue components
- Bones of neurocranium
- Pia and arachnoid
- Parafollicular (C) cells of thyroid
- Aorticopulmonary septum
- Odontoblasts (dentin of teeth)
- Sensory ganglia of CN V, CN VII, CN IX, CN X
- Ciliary (CN III), pterygopalatine (CN VII), submandibular (CN VII), and otic (CN IX) parasympathetic ganglia

Trunk neural crest cells:
- Melanocytes
- Schwann cells
- Chromaffin cells of adrenal medulla
- Dorsal root ganglia
- Sympathetic chain ganglia
- Prevertebral sympathetic ganglia
- Enteric parasympathetic ganglia of the gut (Meissner and Auerbach; CN X)
- Abdominal/pelvic cavity parasympathetic ganglia

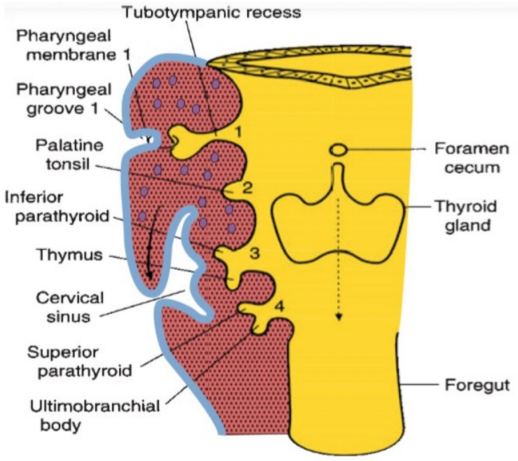
Neral tube develpomental stage 4

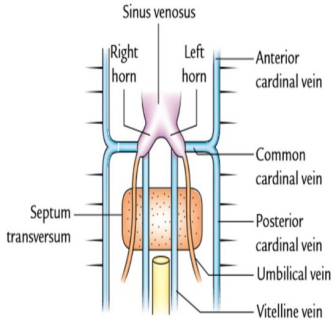
- **Notochord is derived from -**

- **NOTOCHORD REMNANTS**
  - **Nucleus pulposus**
  - **Apical ligament of dens**
  - **Tectorial membrane**

MEDSYNAPSE
Where Concepts Meet Mnemonics

Pouch	Derivatives
First pouch	Pharyngotympanic tube Tympanic (middle ear) cavity
Second pouch	Palatine tonsil Intratonsillar cleft
Third pouch	Inferior parathyroid gland Thymus
Fourth pouch	Superior parathyroid gland Caudal pharyngeal complex* (ultimopharyngeal body)

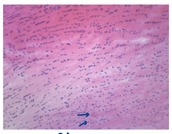




Embryonic	Adult
Vitelline veins	
Right and left	Portion of the IVC,[a] hepatic veins and sinusoids, ductus venosus, portal vein, inferior mesenteric vein, superior mesenteric vein, splenic vein
Umbilical veins	
Right	Degenerates early in fetal life
Left	Ligamentum teres
Cardinal veins	
Anterior	SVC, internal jugular veins
Posterior	Portion of IVC, common iliac veins
Subcardinal	Portion of IVC, renal veins, gonadal veins
Supracardinal	Portion of IVC, intercostal veins, hemiazygos vein, azygos vein

HYALINE

Elastic

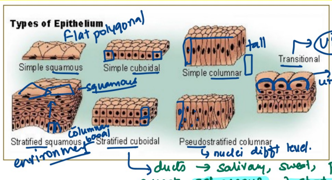


FIBRO

- Yellow cartilage = Elastic
- Verhoeff's stain for – Elastic fibres
- Type 1 collagen – First = fibro   car(two)lage ↳ collagen type 2
- Not covered by perichondrium – Firm fibro (no peri)

• Cricoid (CAT) • Arytenoid except ends • Thyroid • Trachea & bronchi • Epiphyseal plate • Costal cartilage • Articular cartilage at the ends of bones	• IVD – midline • Pubic symphysis • Manubriosternal jt • Labrum- glenoid, acetabulum • Articular disc – TMJ, Sternoclavicular	• Epiglottis ***epiphyseal plate (hyaline) • Eustachian tube • Ear pinna • External auditory meatus • Ends of arytenoid • Cuneiform • Corniculate

EPITHELIUM



unilayered – simple, pseudostratified
multilayered – strat squamous, Transitional.

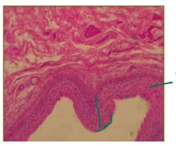
↳ ducts → salivary, sweat, pancreat
except sebaceous → strat squam

Epithelium type	Present in
Stratified squamous → environment	skin, cornea, EAC, vagina, anus, Tongue
Keratinised stratified squamous	skin, gingiva, H. palate, vermilion lip, filiform papillae
Transitional → Reserve	UB, CAPUT → calyx to PU → Transitory prost urethra
Pseudostratified columnar ciliated	Resp tract till prox bronchiole
Simple squamous → exchange	alveolus, endothelium, mesothelium – Bowman space, pleura, peritoneal

PSCC – Pseudostrat ciliated columnar (Trachea)

Transitional / urothelium

Strat squamous



Transitional epithelium

URINARY TRACT EPITHELIUM

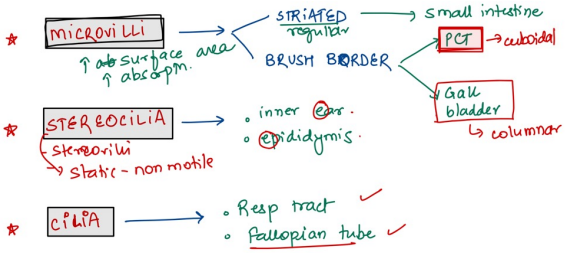
Site	Epithelium
Bowman's capsule	simple squamous
PCT ,Thick desc limb	Brush border cuboidal
Loop of henle	Simple squamous
Thick asc limb , DCT	cuboidal
Collecting ducts	columnar ± microvilli
Calyx to prostatic urethra	Transitional epith
Middle urethra – membranous, Spongy	pseudostrat columnar
Terminal urethra	strat squamous.

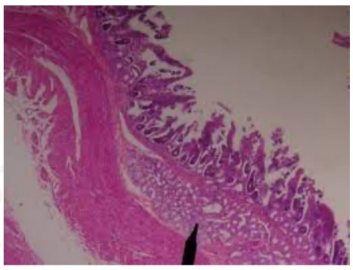
RESPIRATORY TRACT EPITHELIUM

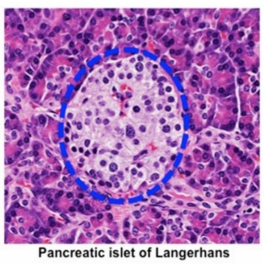
Site	Epithelium
Nasal mucosa to proximal bronchiole	Trachea Pseudostrat ciliated columnar
Terminal bronchiole	cuboidal ciliated
Respiratory bronchiole	cuboidal nonciliated.
Alveolus	simple squamous.

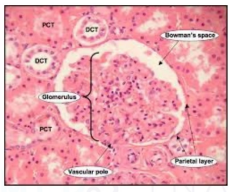
GIT EPITHELIUM

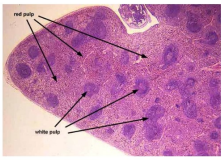
Site	Epithelium
Gingiva, Hard palate, vermilion lip, filiform papillae	Keratinised stratified squamous epithelium
Tongue	strat squam.
Esophagus	strat squam.
Anus	strat squamous
Intestine	columnar ± microvilli → striated

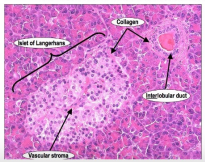


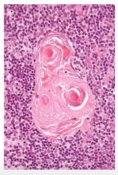


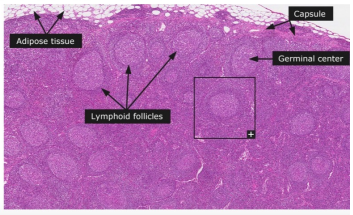


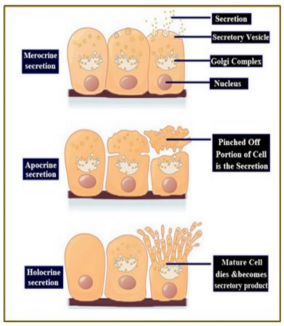


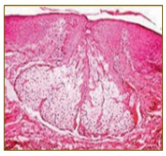


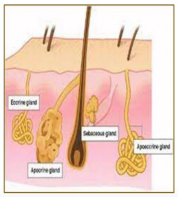






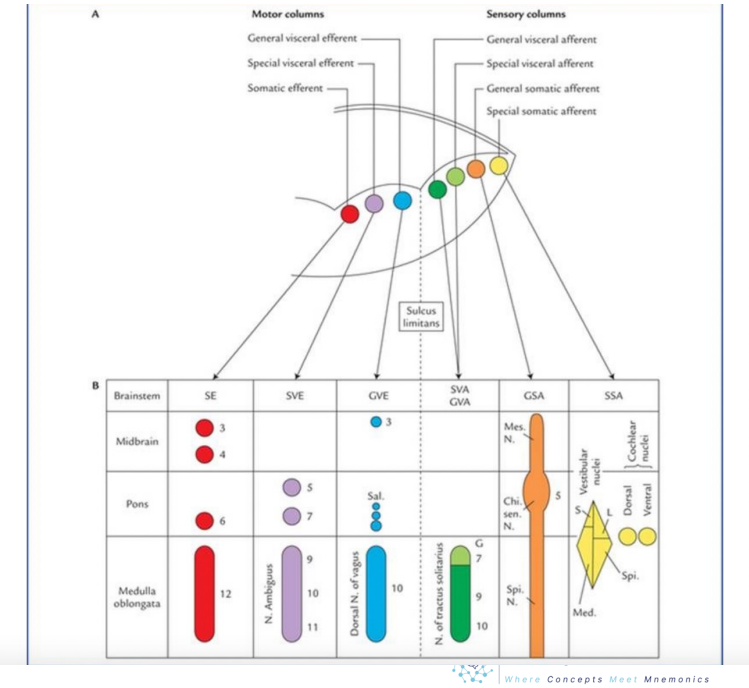




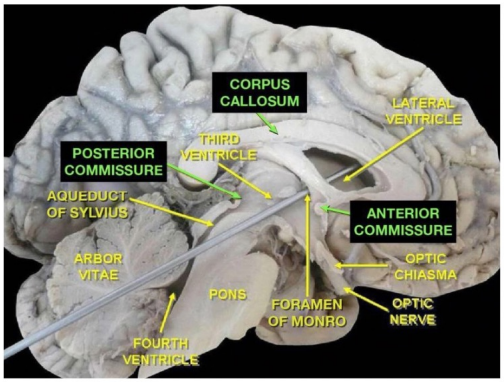


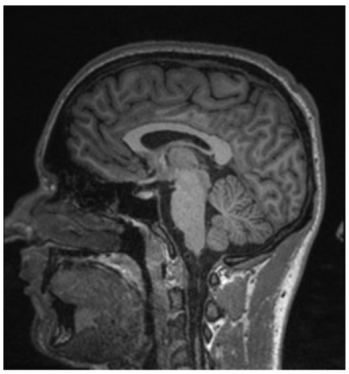
- Merocrine → "MERE" secretions → Eccrine sweat palms soles no hair
- Apocrine (top) → "above" MAC = : part Mammary axilla. · ceruminous
- Holocrine → "whole" ↓ "sab" · sebaceous · Meibomian.

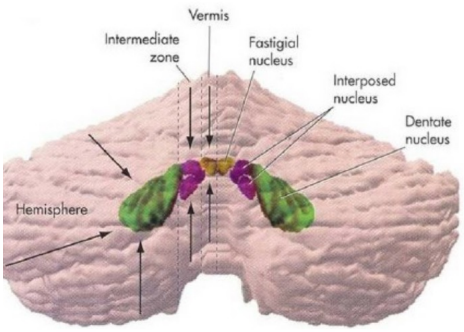
MEDSYNAPSE
Where Concepts Meet Mnemonics

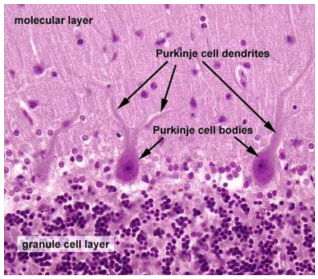


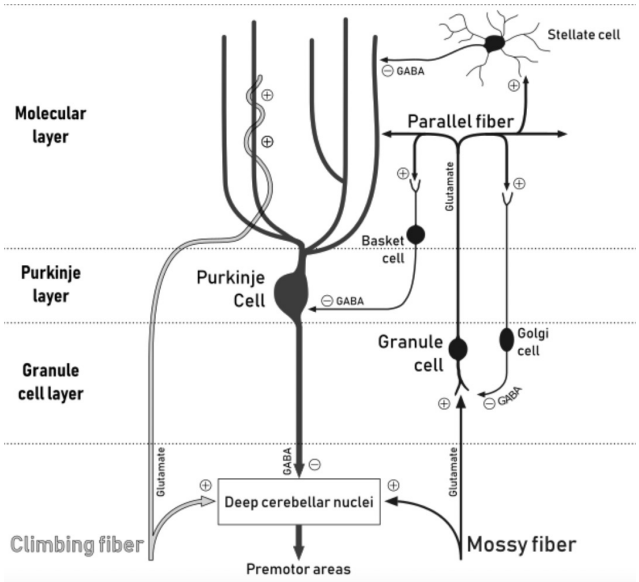
Where Concepts Meet Mnemonics

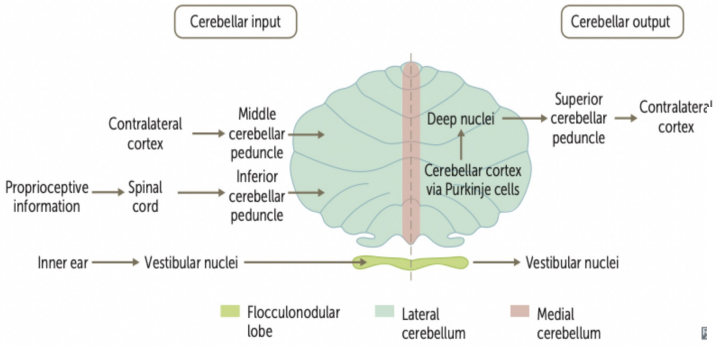


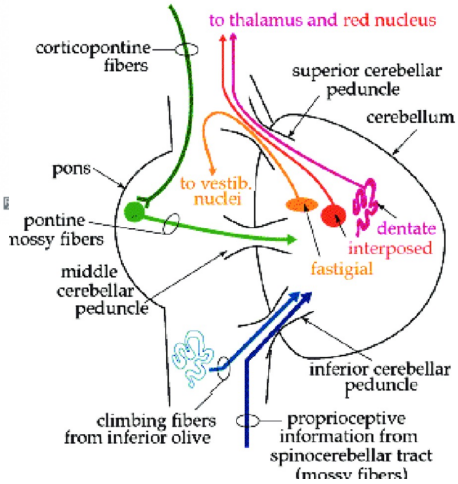










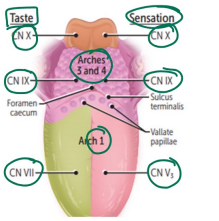


Peduncle	Afferent fibers	Efferent fibers
Superior cerebellar peduncle	**Anterior spinocerebellar tract**	• **Globose - emboliform - rubral pathway** • **Dentatothalamic pathway**
Middle cerebellar peduncle - Largest, most, lateral and only afferent	**Corticopontocerebellar pathway**	-
Inferior cerebellar peduncle	• **Posterior spinocerebellar tract** • **Cuneocerebellar tract** • **Olivocerebellar tract** • **Reticulocerebellar tract** • **Trigeminocerebellar tract** • **Vestibulocerebellar tract**	• **Fastigial vestibular pathway** • **Fastigial reticular pathway**

MEDSYNAPSE
Where Concepts Meet Mnemonics

TONGUE

Taste — NTS (9 10 7)



Part of tongue	Develops from arch	Nerve carrying general sensation	Nerve carrying taste sensation
Ant 2/3 rd	1	5 (lingual)	7 (chorda tympani)
Post 1/3 rd	3 → 9		9
Posteriormost	4 → 10		10

SVA NTS → 9 10 7

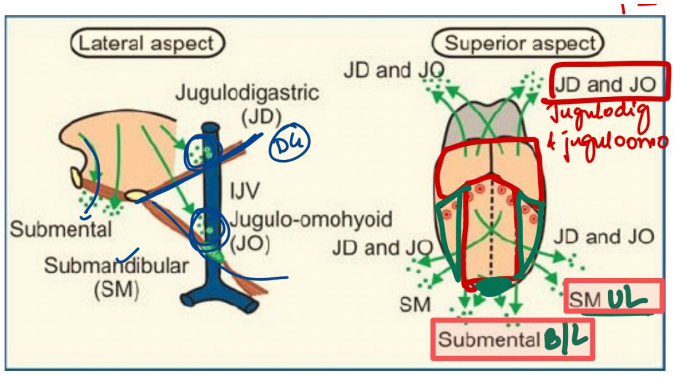
Important points about tongue

- Tongue develops from arch – 1, 3, 4 (x2)
- 12 CN is pure motor – develops from basal/ventral plate (medulla) — Rule of (12) → 3 4 6 12 (GSE)
- 12 CN palsy occurs in brainstem syndrome – Medial medullary (Dejerine) — medial
- Tongue deviates to (Rt) side / same side — Tongue licks the wound

DASi
Dorsal alar sensory
BV
Basal ventral
Gmotor

1 3 4 (x2) 5 → post, 7 – pre, 9 3, 10, 10

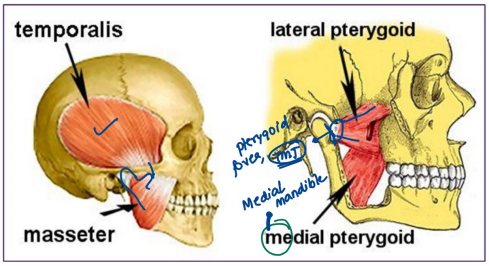
MEDSYNAPSE
Where Concepts Meet Mnemonics



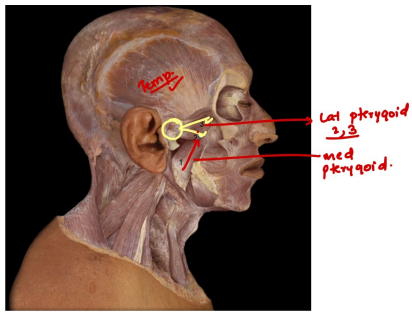
- Tip → BIL Submental
- Ant 2/3rd
  - Lateral border- UIL Submandib
  - Central part – BIL JD & JO
- Post 1/3rd -

MEDSYNAPSE
Where Concepts Meet Mnemonics

MUSCLES OF MASTICATION

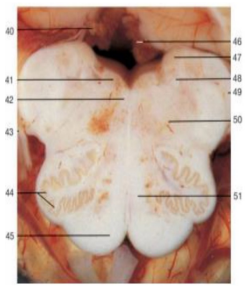


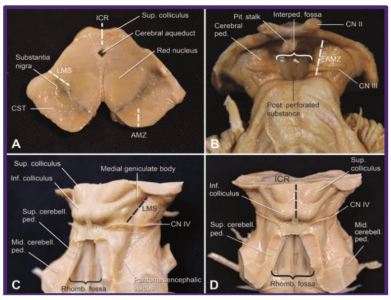
* BUCCINATOR XXX
↓
facial n
MASTICATION.
(M) → 1st arch.
↳ mandibular n
Trunk AD (PD) XXX
1 3
Me
MEDIAL P.

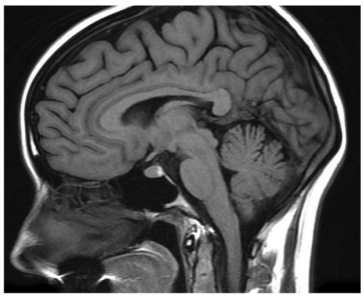


- All elevate mandible except (Jaw depressions / opening mouth is done by) -
- All cause protrusion except
- TMJ articular disc insertion
- Coronoid process insertion

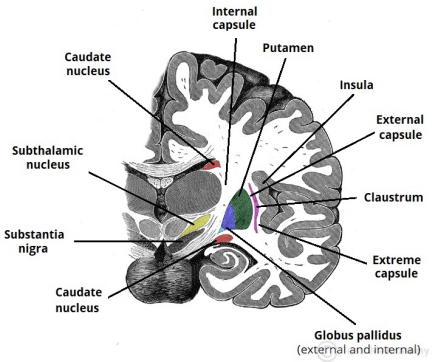
MEDSYNAPSE
Where Concepts Meet Mnemonics

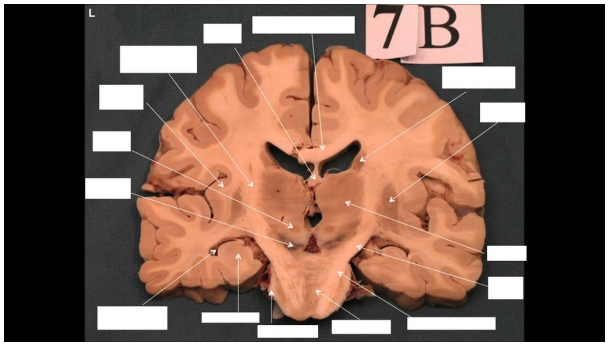


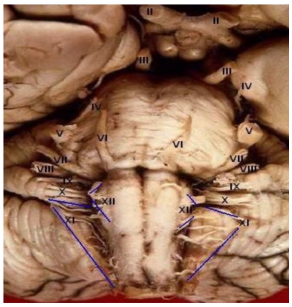




MEDSYNAPSE
Where Concepts Meet Mnemonics

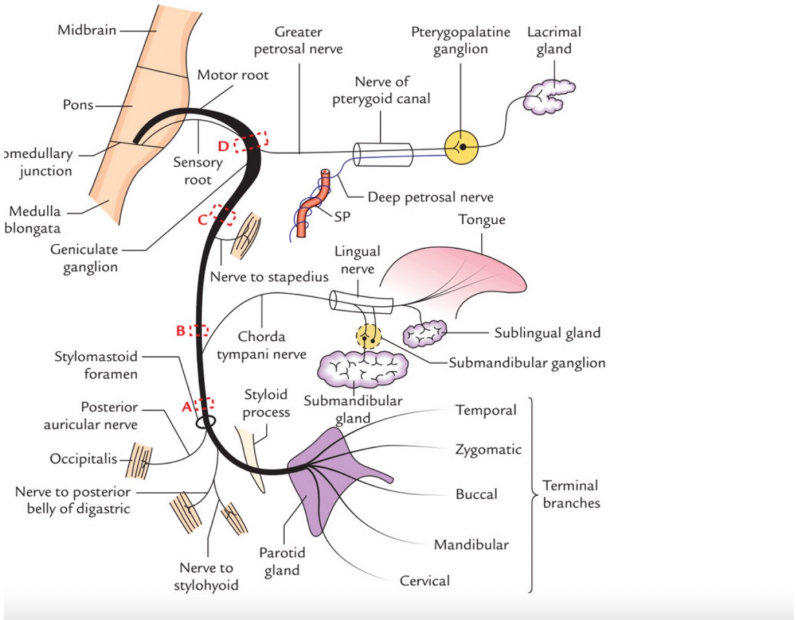


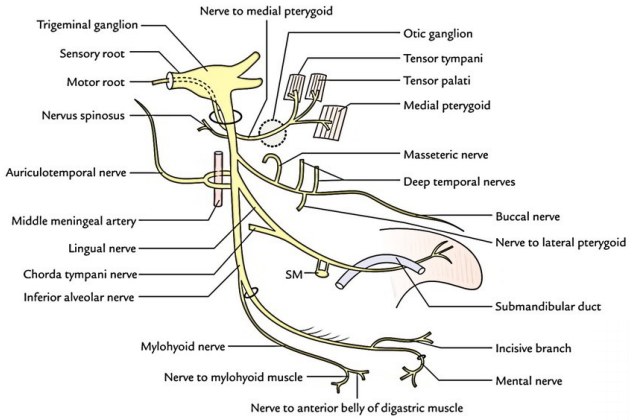


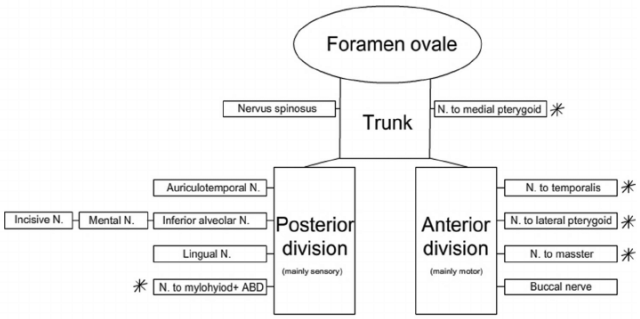


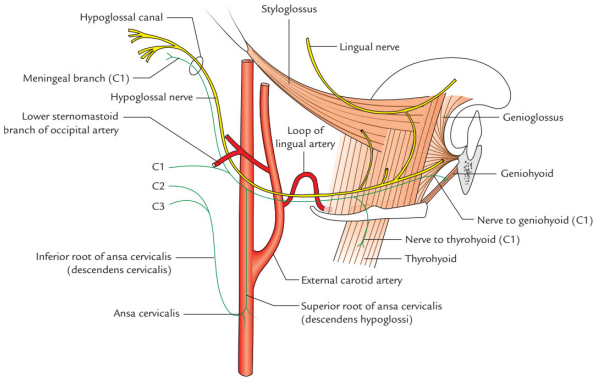
Parasympathetic Ganglia of The Head & Neck

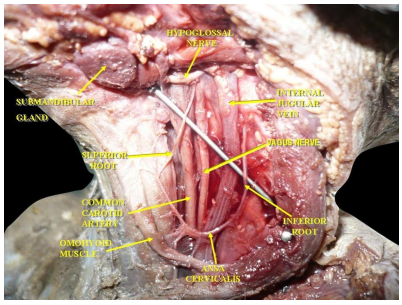
Nucleus	Pre-ganglionic	Ganglion	Post-ganglionic	Target organs
Edinger-Westphal nucleus (Oculomotor nerve)	Travels with the motor root of the oculomotor nerve	Ciliary ganglion	Travels via the short ciliary nerves	Sphincter pupilliae Ciliary muscles
Superior salivatory nucleus (Facial nerve)	Within the greater petrosal nerve & vidian nerve of pterygoid canal	Pterygopalatine ganglion	Joins the maxillary nerve	Lacrimal gland Nasopharynx Palate Nasal cavity
	Within the chorda tympani of the facial nerve	Submandibular ganglion	travel directly to target organs	Sublingual & submandibular glands
Inferior salivatory nucleus (Glossopharyngeal nerve)	Within the lesser petrosal nerve	Otic ganglion	Join the auriculotemporal nerve	Parotid gland
Dorsal vagal motor nucleus (vagus nerve)	Within vagus nerve	Located within multiple target organs	N/A	Smooth muscle of the trachea, bronchi & GIT

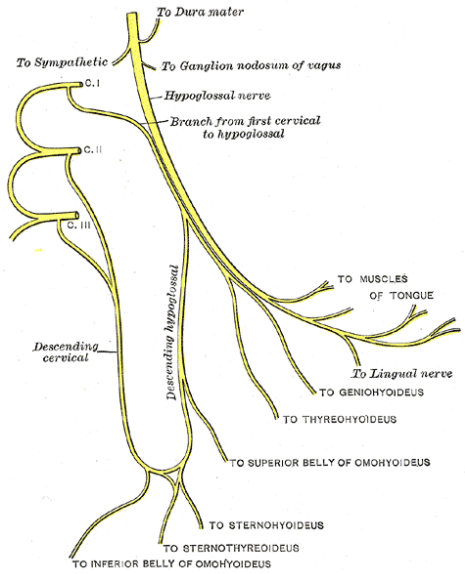












REMNANTS OF CVS EMBRYONIC PARTS

EMBRYONIC PART	REMNANT
sep. primum	Fossa ovalis floor →
sep secundum	Fossa ovalis limbus /annulus (sup)
D. arteriosus.	Ligamentum arteriosum DA → 6th arch (L)
D. venosus. →	Ligamentum venosum DV
Umbilical artery →	medial umb. ligament, sup vesical artery
Umbilical vein →	left left → ligamentum teres → falciform ligam

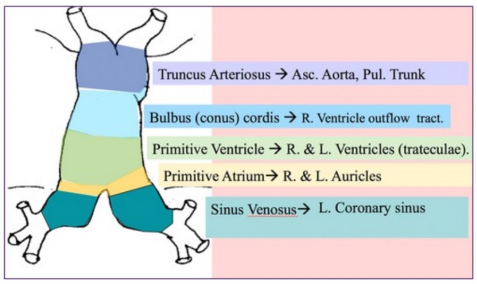
R regresses

Shunts oxy blood from LIV to IVC

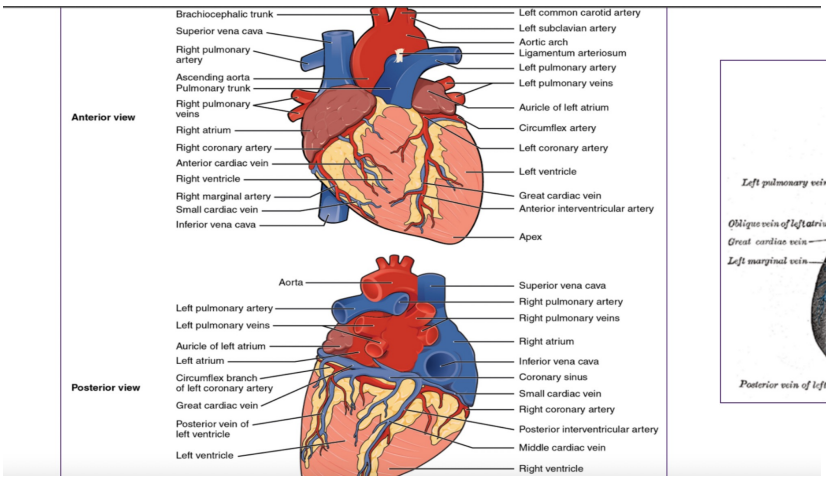
2AV cord

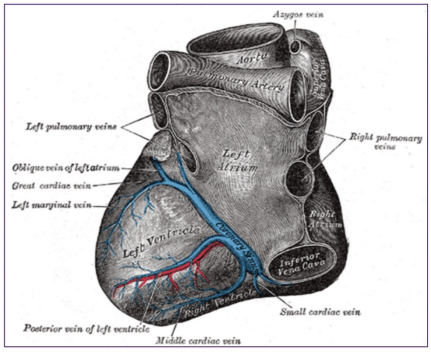
UB

single umb a → a/w Renal. anomalies

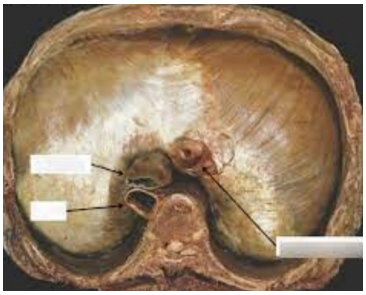


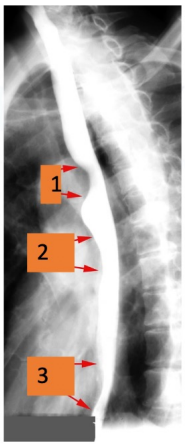
MEDSYNAPSE
Where Concepts Meet Mnemonics

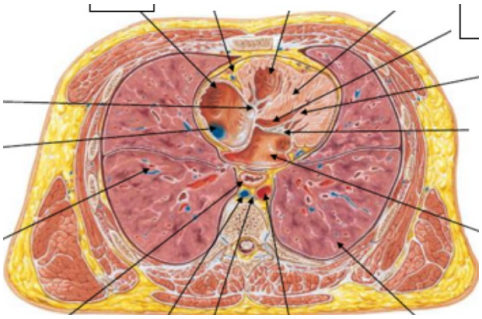


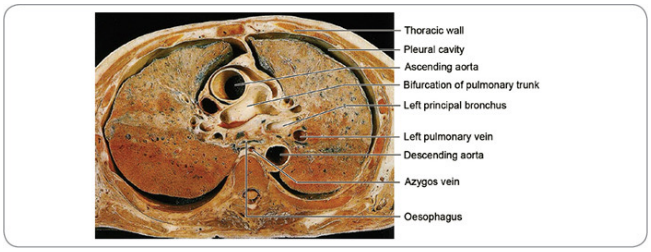


MEDSYNAPSE
Where Concepts Meet Mnemonics

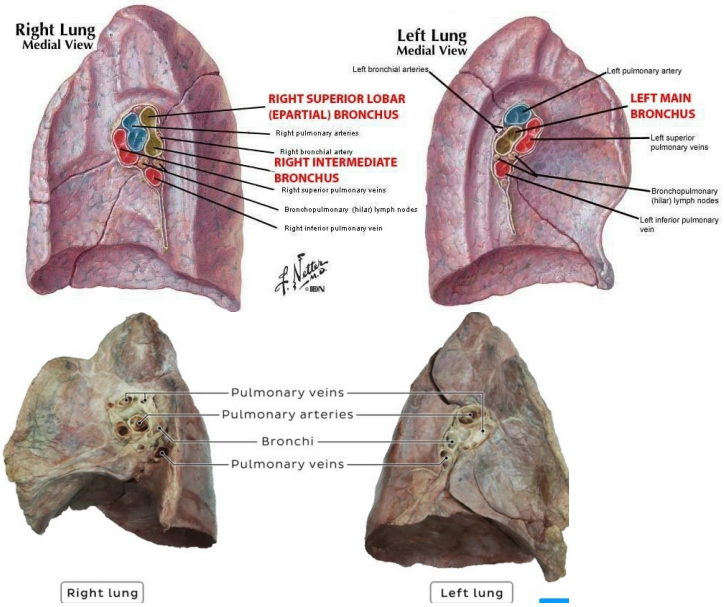


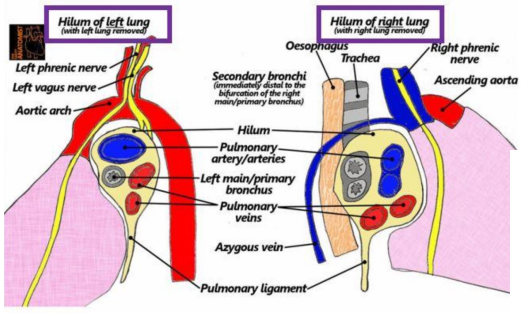


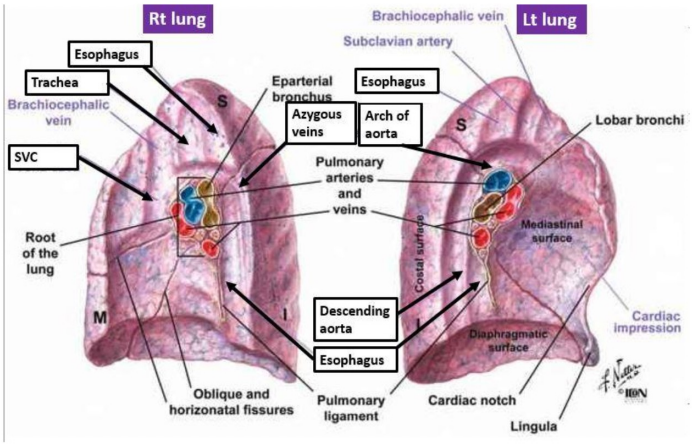


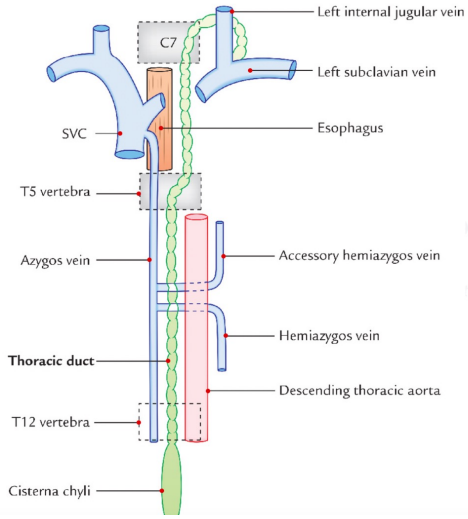


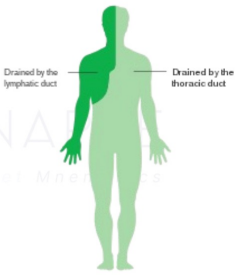
MEDSYNAPSE
Where Concepts Meet Mnemonics



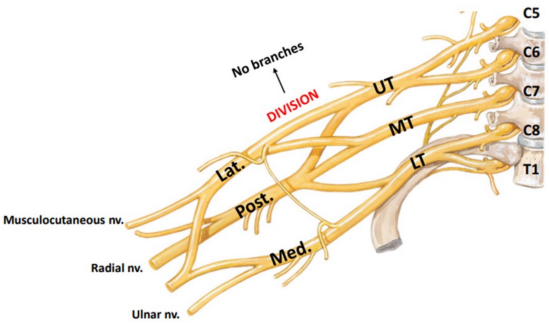


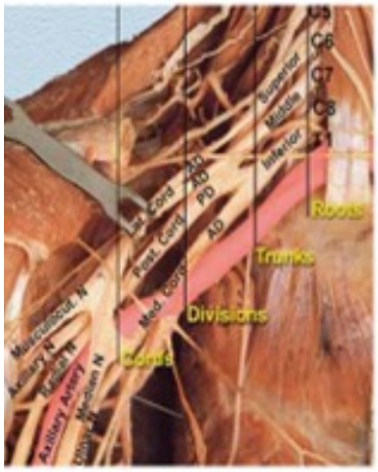


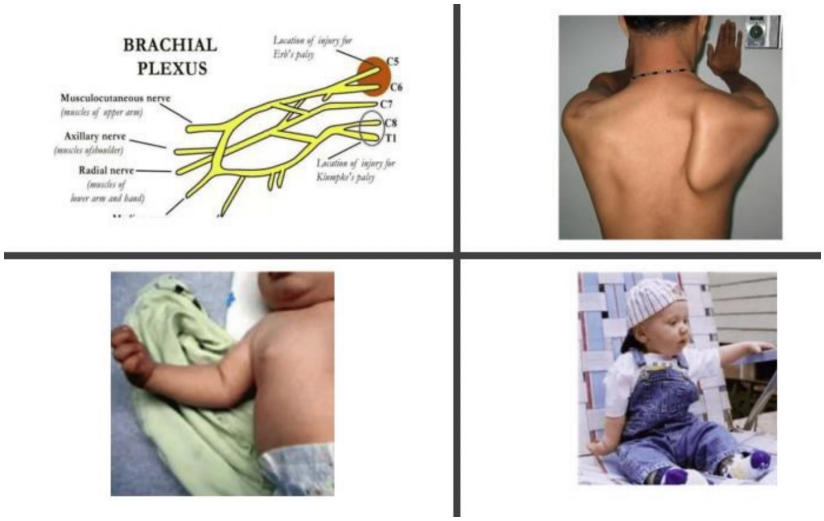


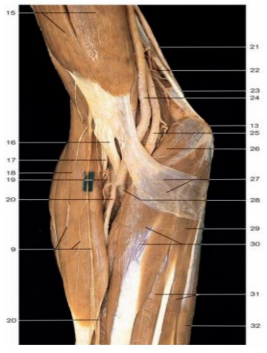


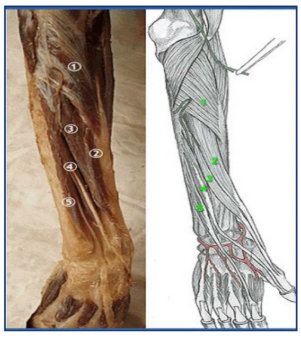
Medsynapse by Dr. Nikita

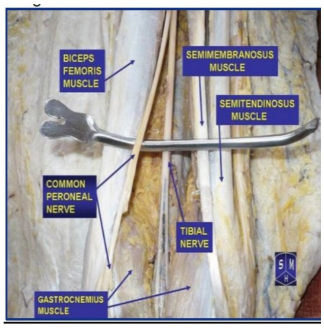


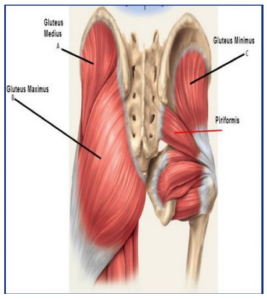


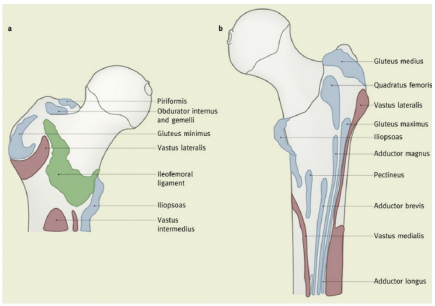


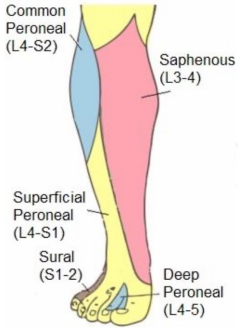


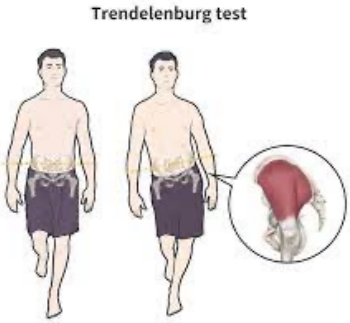




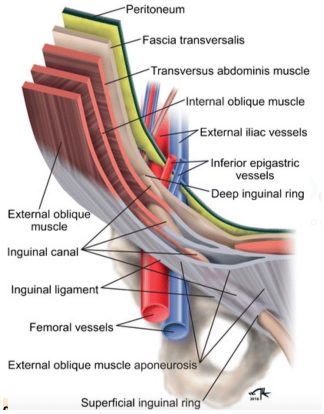


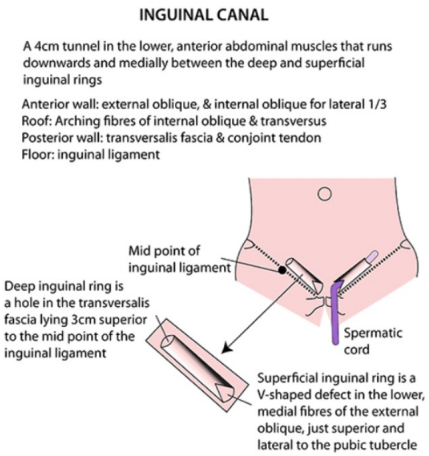


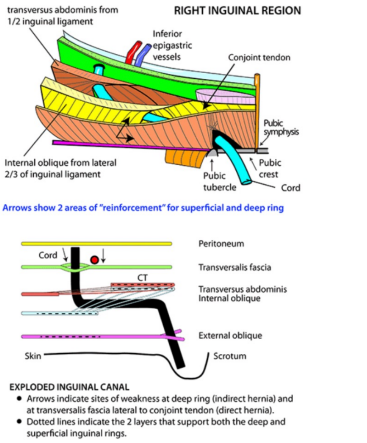




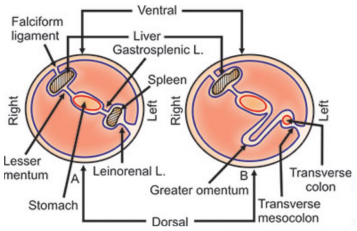
MEDSYNAPSE
Where Concepts Meet Mnemonics



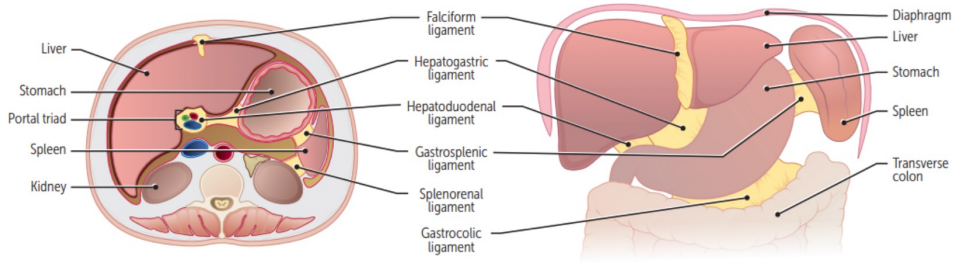




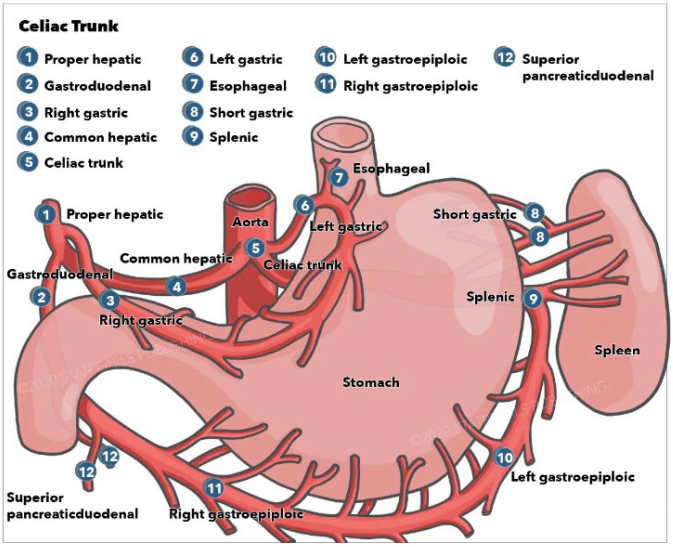
MEDSYNAPSE
Where Concepts Meet Mnemonics

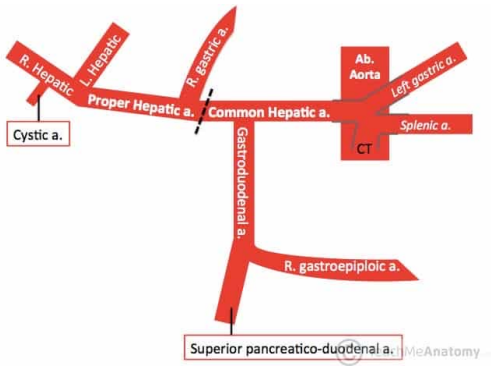


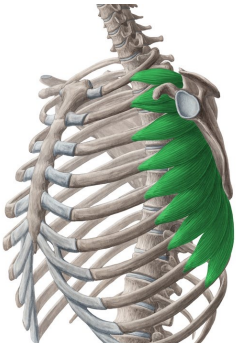
Dorsal Mesentery Derivatives	Ventral Mesentery Derivatives[a]
Greater omentum (gastrocolic, gastrosplenic, and gastrophrenic ligaments)	Lesser omentum (hepatogastric and hepatoduodenal ligaments)
Splenorenal ligament	Falciform ligament
Mesentery of small intestine	Coronary ligament (right and left triangular ligaments)
Mesoappendix	
Transverse mesocolon	
Phrenicocolic ligament	
Sigmoid mesocolon	



- **PANCREATIC TAIL –** / splenic artery → lienorenal ligam
- **PORTAL TRIAD –** Hepatoduod (lesser om) * Gastrosplenic → short gastric & L. G.E. vessels
- **LIGAMENTUM TERES HEPATIS –** falciform. lig = Lt umb vein
- **SPLEEN DEVELOPS IN -** DORSAL MESOGASTRium xx endod







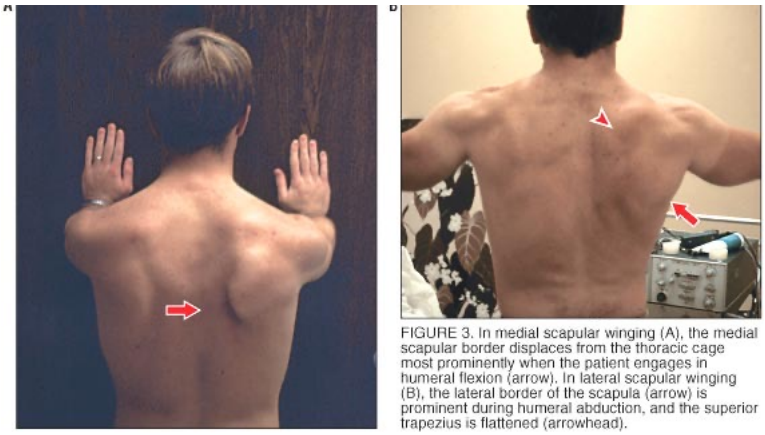


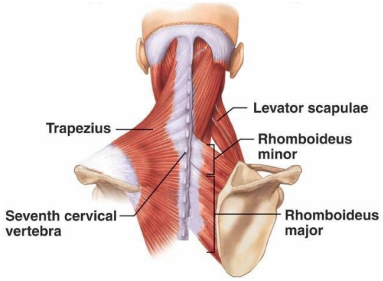
FIGURE 3. In medial scapular winging (A), the medial scapular border displaces from the thoracic cage most prominently when the patient engages in humeral flexion (arrow). In lateral scapular winging (B), the lateral border of the scapula (arrow) is prominent during humeral abduction, and the superior trapezius is flattened (arrowhead).

Muscles of the shoulder joint			
Movement	**Prime Mover**	**Origin**	**Insertion**
Flexion	Anterior deltoid	Clavicle, scapula and acromion process	Humerus
	Upper part of pectoralis major	Clavicle, sternum and ribs	Humerus
	Coracobrachialis	Scapula	Humerus
	Serratus anterior	Side of ribs	Scapula
Extension	Posterior deltoid	Clavicle, scapula and acromion process	Humerus
	Latissimus dorsi	Ilium, lumbar and thoracic vertebrae	Humerus
	Teres major	Scapula	Humerus
Horizontal flexion	Pectoralis major	Clavicle, sternum and ribs	Humerus
Horizontal extension	Trapezius	Cervical and thoracic vertebrae	Scapula
Abduction	Medial deltoid	Clavicle, scapula and acromion	Humerus
	Supraspinatus	Scapula	Humerus
Adduction	Lower part of pectoralis major	Clavicle, ribs and sternum	Humerus
	Latissimus dorsi	Ilium, lumbar and thoracic vertebrae	Humerus
	Teres major	Scapula	Humerus
	Teres minor	Scapula	Humerus
Medial rotation	Pectoralis major	Clavicle, sternum and ribs	Humerus
	Subscapularis	Scapula	Humerus
	Latissimus dorsi	Ilium, lumbar and thoracic vertebrae	Humerus
	Teres major	Scapula	Humerus
	Anterior deltoid	Clavicle, scapula and acromion process	Humerus
Lateral rotation	Infraspinatus	Scapula	Humerus
	Teres minor	Scapula	Humerus
	Posterior deltoid	Clavicle, scapula and acromion process	Humerus
	Lower trapezius	Cervical and thoracic vertebrae	Scapula

* Prime movers shaded grey are the principle muscles causing the movement.

Muscles of the shoulder girdle			
Movement	**Prime Mover**	**Origin**	**Insertion**
Elevation	Trapezius	Skull	Clavicle
	Rhomboids	Cervical and thoracic vertebrae	Scapula
	Levator scapulae	Cervical vertebrae	Scapula
Depression	Trapezius (lower)	Thoracic vertebrae	Base of spine
	Pectoralis minor	Ribs	Scapula
	Serratus anterior (lower)	Side of ribs	Scapula
Upward rotation	Trapezius (upper)	Ligaments of the neck	Acromion process
	Serratus anterior	Side of ribs	Scapula
Downward rotation	Rhomboids	Cervical and thoracic vertebrae	Scapula
	Levator scapulae	Cervical vertebrae	Scapula
Protraction / Abduction	Serratus anterior	Side of ribs	Scapula
Retraction / Adduction	Trapezius	Cervical and thoracic vertebrae	Scapula

* Prime movers shaded grey are the principle muscles causing the movement.



Movement	Muscle
Flexion	Psoas major, iliacus, pectineus, rectus femoris and Sartorius
Extension	Gluteus maximus and hamstrings (semitendinosus, semimembranosus and bicep femoris)
Abduction	Gluteus maximus, medius and minimus, and tensor fascia lata
Adduction	Adductor magnus, logus and brevis, gracilis, and pectineus
Internal rotation	Gluteus medius and minimus, tensor fascia lata, psoas major, and iliacus
External rotation	Gluteus maximum, piriformis, obturator internus, gemellus superior and inferior, quadrates femoris and obturator

MEDSYNAPSE
Where Concepts Meet Mnemonics


MEDSYNAPSE
Where Concepts Meet Mnemonics