TRICKY CONCEPTS

MICRO / ANAT

MICROBIOLOGY

A 7-year-old boy is brought to the pediatric clinic by his mother because of multiple skin lesions on his arms and trunk for the past 6 weeks. The lesions are not painful but the child sometimes scratches them due to mild itching. He has no fever, weight loss, or systemic symptoms. His vaccinations are up to date, and he has no significant medical history. He lives with his parents and attends elementary school. On examination, the child is well-appearing. Multiple small, firm, dome-shaped, flesh-colored papules with a central dimple are present on his trunk and flexor surfaces of the arms. No mucosal involvement is noted. Which of the following viruses is the most likely cause of this child's condition?

A) dsDNA unenveloped
B) ssDNA unenveloped
C) dsRNA unenveloped
D) dsDNA enveloped

A 10-month-old boy is brought to the emergency department because of a seizure that lasted 3 minutes. His mother reports that he has had fever up to 39.5°C (103.1°F) for the past 3 days and mild irritability, but no cough, rhinorrhea, or vomiting. On arrival, the child is alert but fussy. His temperature is 38.7°C (101.7°F), pulse is 160/min, and respirations are 30/min. Physical examination reveals no meningismus.
Laboratory studies, including cerebrospinal fluid analysis, are unremarkable. The next day, his fever subsides abruptly, and a blanching, erythematous, maculopapular rash appears on his trunk and spreads to the extremities.

Which of the following pathogens is the most likely cause of this child's illness?

A. Parvovirus B19

B. Human herpesvirus 6

C. Epstein-Barr virus

D. Coxsackievirus A16

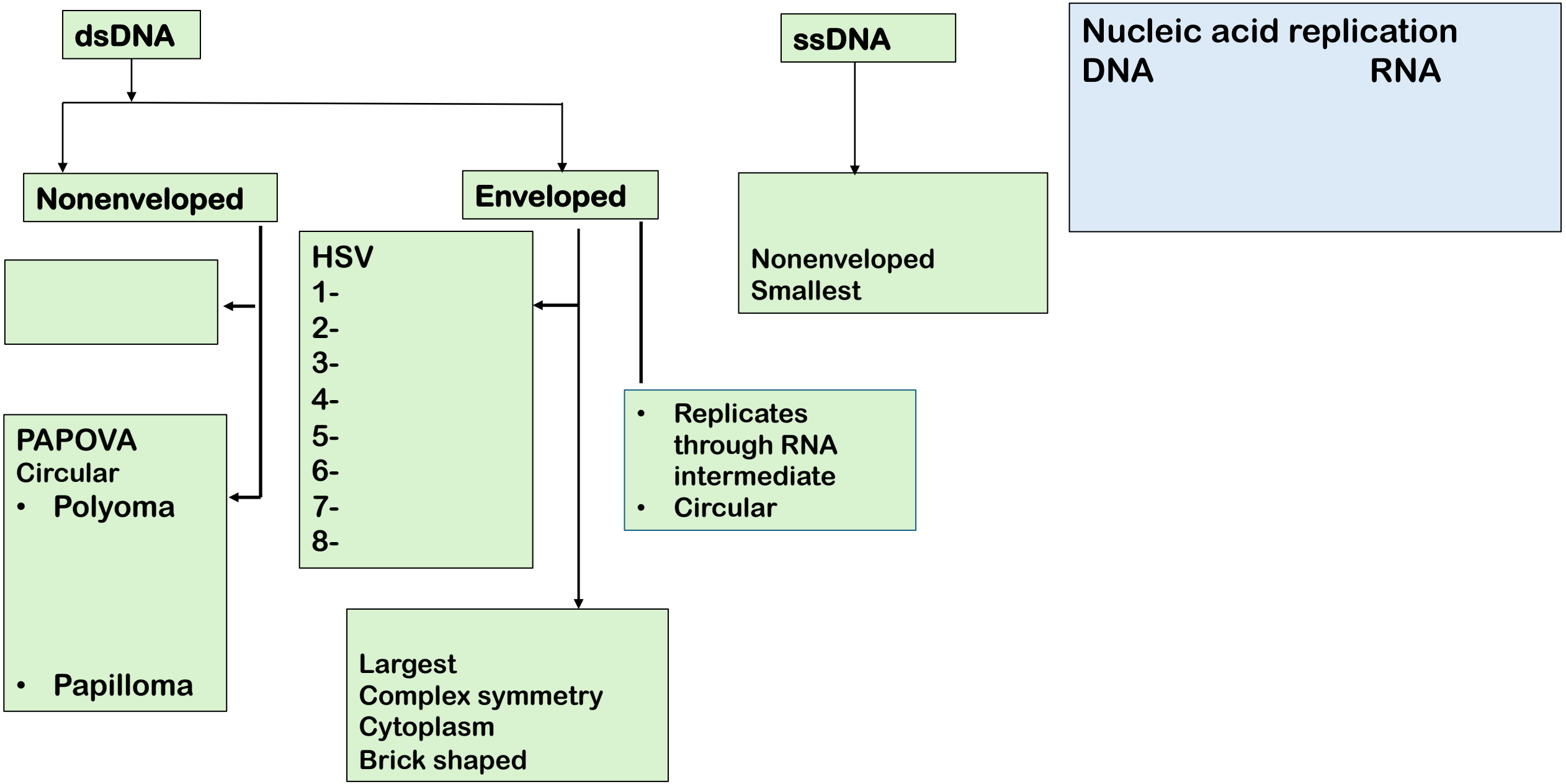
A 2-year-old girl is brought to the emergency department with fever, poor appetite, and irritability. Her parents report that she has been drooling and refusing food for the past day. On examination, her temperature is 38.5°C (101.3°F). The child has painful vesicular lesions on the tongue and oral mucosa. Similar vesicular eruptions are noted on the palms and soles. No skin lesions are seen on the trunk.

Which of the following best describes the causative organism of this illness?

A) Nonenveloped, single-stranded RNA virus of the Picornaviridae family
B) Enveloped, double-stranded DNA virus of the Herpesviridae family
C) Enveloped, single-stranded RNA virus of the Paramyxoviridae family
D) Nonenveloped, double-stranded DNA virus of the Adenoviridae family
E) Enveloped, single-stranded RNA virus of the Orthomyxoviridae family

A 6-month-old boy is brought to the emergency department in January with 2 days of cough, rhinorrhea, and fever. Today, his mother noticed rapid breathing and wheezing. The child was born at term, is up-to-date on vaccinations, and has no past medical history.
On exam, temperature is 38.2°C (100.8°F), pulse 162/min, respiratory rate 56/min, and oxygen saturation 90% on room air. He appears irritable and is using accessory muscles for breathing. Auscultation reveals diffuse wheezes and crackles. Chest x-ray shows hyperinflation and peribronchial thickening. Which of the following is the most likely cause of this patient's condition?
A.ssRNA negative sense
b. dsRNA negative sense
c. ssRNA positive sense
d. dsDNA enveloped

VIROLOGY- DNA VIRUSES



VIROLOGY- RNA VIRUSES

ssRNA

Positive sense

Unenveloped

PEC

Norwalk virus
PERCH

Hep A, E:

Enveloped

- Flavi

HCV, YF, Dengue, Zika, WN, JE, KFD

- Toga "CREW"
- Retro (2 copies)
- Corona

Negative sense Enveloped

"MR-FAB Delta"

dsRNA

Nonenveloped
Wheel shaped
Villous atrophy
NSP4 toxin
IOC:

UNSEGMENTED except

A 42-year-old man comes to the clinic in January with fever, chills, sore throat, myalgias, and dry cough that began yesterday morning. He has no chronic medical conditions. He works in an office where several coworkers were recently ill with similar symptoms. He has not received the influenza vaccine this season. Temperature is 38.9 °C (102 °F), pulse 110/min, respirations 20/min. Physical exam shows an ill-appearing man with mild pharyngeal erythema and diffuse muscle tenderness. A rapid influenza antigen test is positive for influenza A virus. He is prescribed oseltamivir. Which of the following best explains the mechanism of action of this medication?

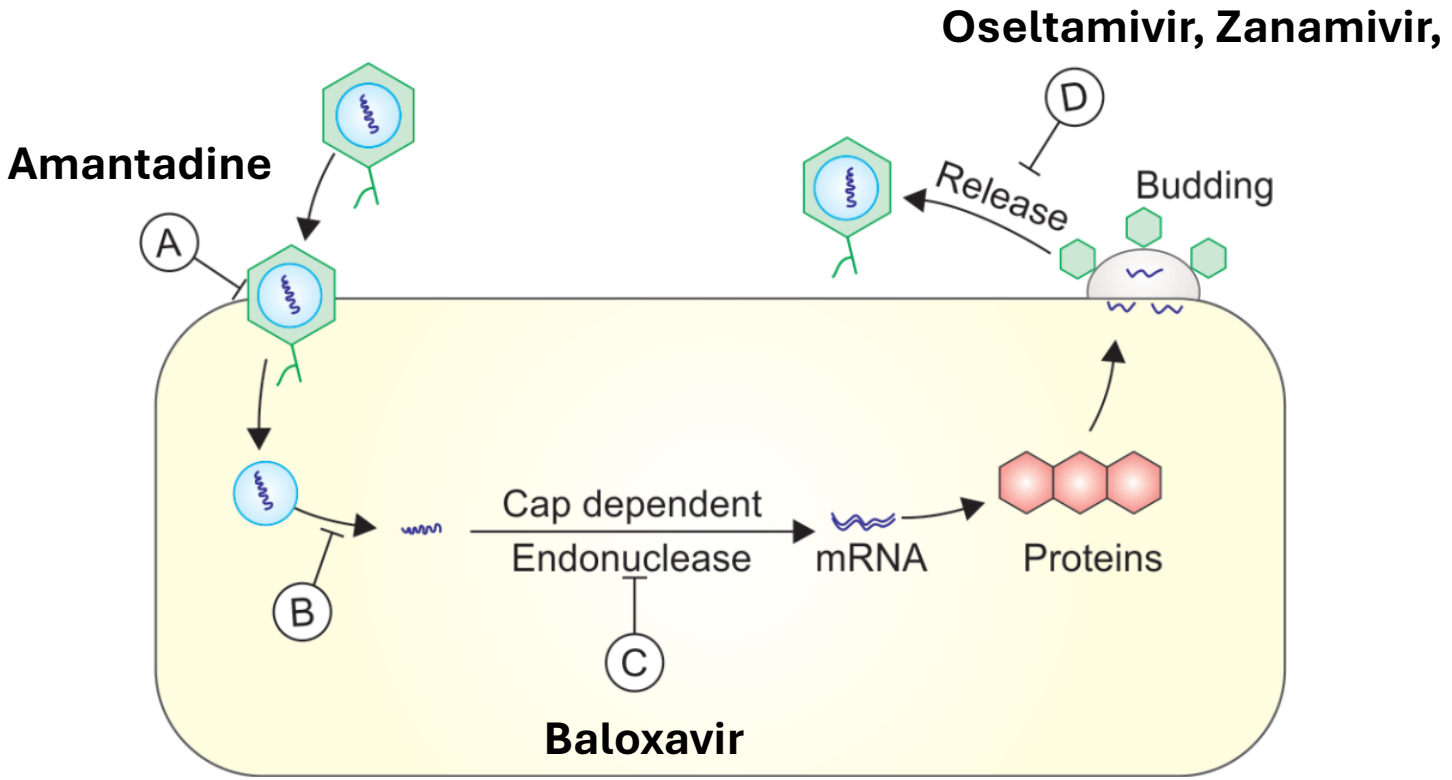
A. Blocks the M2 ion channel, preventing viral uncoating

B. Inhibits neuraminidase, decreasing release of progeny virions from infected host cells

C. Inhibits viral RNA-dependent RNA polymerase, blocking genome replication

D. Prevents viral attachment to host cell sialic acid receptors

ANTIVIRALS



Inhibits viral RNA-dependent RNA polymerase in COVID-19:
Inhibit viral DNA polymerase in VZV/HSV (Viral thymidine kinase):
Inhibit viral DNA polymerase in CMV (Viral UL97 kinase):

A 9-year-old boy is brought to the clinic by his parents due to perianal itching that is most intense at night. His teacher also reports that several children in his class have similar symptoms. Physical examination is unremarkable. A piece of clear adhesive tape applied to the perianal region reveals elongated, oval eggs under the microscope.
Which of the following is the most appropriate pharmacologic treatment for this patient?

A. Ivermectin

B. Albendazole

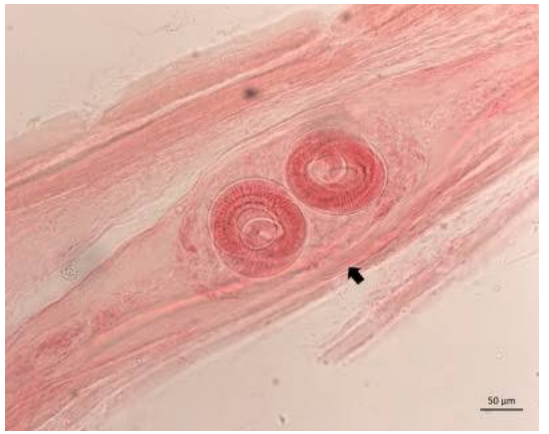
C. Praziquantel

D. Metronidazole

A 34-year-old man from rural Mexico presents to the emergency department after a new-onset generalized tonic–clonic seizure. He recently immigrated to the United States. He has no past medical history and takes no medications. On exam, the patient is postictal but hemodynamically stable. CT scan of the brain shows multiple calcified cystic lesions with surrounding edema. Stool studies are negative for ova and parasites.
Which of the following is the most likely mechanism by which this patient acquired his current condition?
A. Ingestion of undercooked pork containing larval cysts that mature into adult tapeworms in the intestine
B. Ingestion of water or food contaminated with eggs excreted in human feces
C. Direct invasion of the intestinal mucosa by adult tapeworms
D. Penetration of intact skin by larval forms in contaminated soil

A 25-year-old man presents with 1 week of fever, myalgias, and swelling around the eyes. Two weeks ago, he attended a wilderness retreat in Alaska, where he ate undercooked bear meat. Since then, he has developed abdominal cramping, diarrhea, and progressive muscle pain. On exam, he is febrile and appears ill. Periorbital edema is noted. Laboratory studies show:

- WBC: 14,000/μL (40% eosinophils)
- Creatine kinase: elevated
- AST/ALT: mildly elevated



Muscle biopsy demonstrates encysted larvae.

Which of the following organisms is the most likely cause of this patient's condition?

A. Enterobius vermicularis

B. Trichinella spiralis

C. Ancylostoma duodenale

D. Toxocara canis

A 17-year-old boy is brought to the emergency department with severe headache, fever, nausea, and confusion that began 2 days ago. His parents report that he returned from a summer camp 5 days ago, where he frequently swam and dove in a freshwater lake. On arrival, temperature is 39.5°C (103.1°F), blood pressure 110/70 mm Hg, pulse 110/min. Neurologic exam shows nuchal rigidity and positive Kernig and Brudzinski signs. CT scan of the brain is unremarkable. Lumbar puncture shows: Opening pressure: 280 mm H_2O; WBC count: 800/μL (90% neutrophils); Protein: 160 mg/dL; Glucose: 20 mg/dL. Gram stain and routine bacterial cultures are negative. Despite empiric broad-spectrum antibiotics, the patient deteriorates rapidly and dies within a week. Which of the following is the most likely cause of this patient's condition?

A. Free-living amoeba entering through the nasal mucosa and cribriform plate

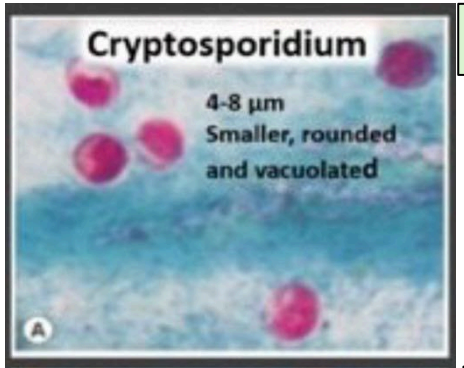
B. Encapsulated yeast acquired from pigeon droppings inhalation

C. Vector-borne protozoan infecting cerebral vasculature

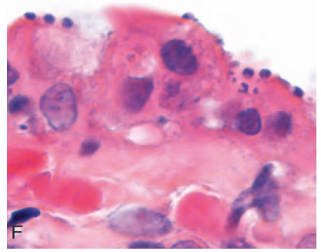
D. Reactivation of latent herpesvirus in trigeminal ganglia

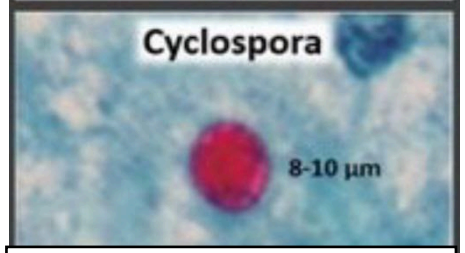
Parasitology- Protozoa

Sporozoa



DOC-Nitazoxanide

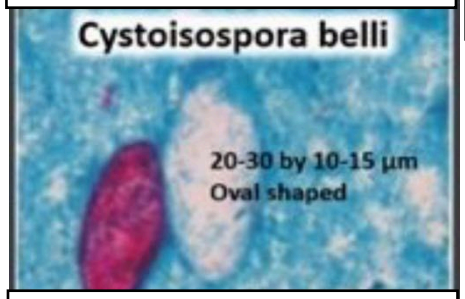


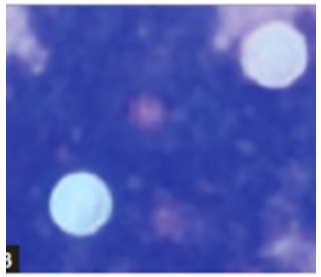


DOC-TMP-SMX

Raspberry
Auto-fluorescence

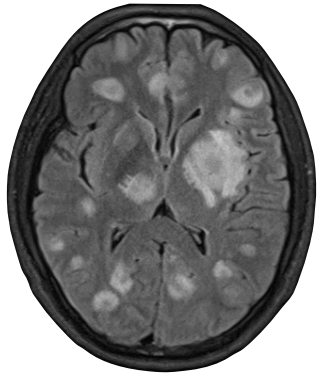
DOC-TMP-SMX





Auto-fluorescence

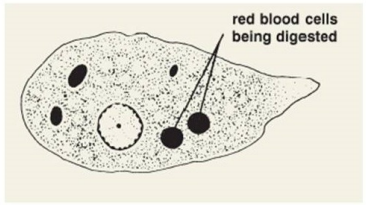
Ingestion-
Cat feces:
Meat:
Vertical:
Frenkel test
Sabin Feldman test
IgG avidity test:
High-
Low-
DOC:
DOC in Pregnancy:

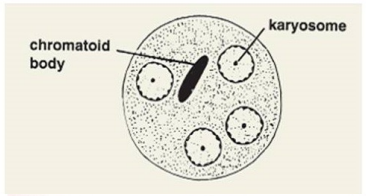


Plasmodium
Babesiosis

Parasitology- Protozoa

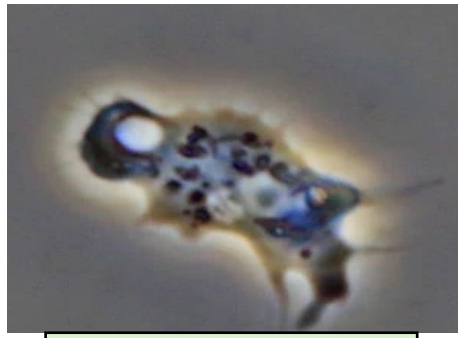
Amoeba





DOC: Metrogyl + Paromomycin

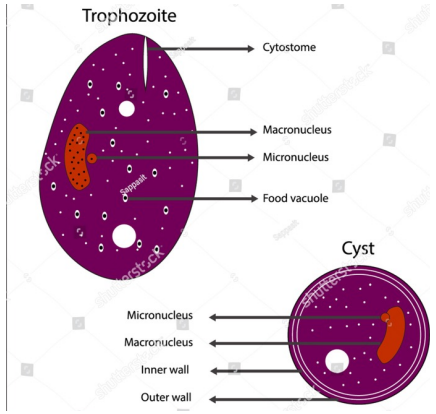
DOC: Amp B



DOC: Pentamidine

Balmuthia
Sappnia

Ciliated



DOC: Doxycycline

Flagellated

T.cruzi/American trypanosomiasis

DOC-Benznidazole

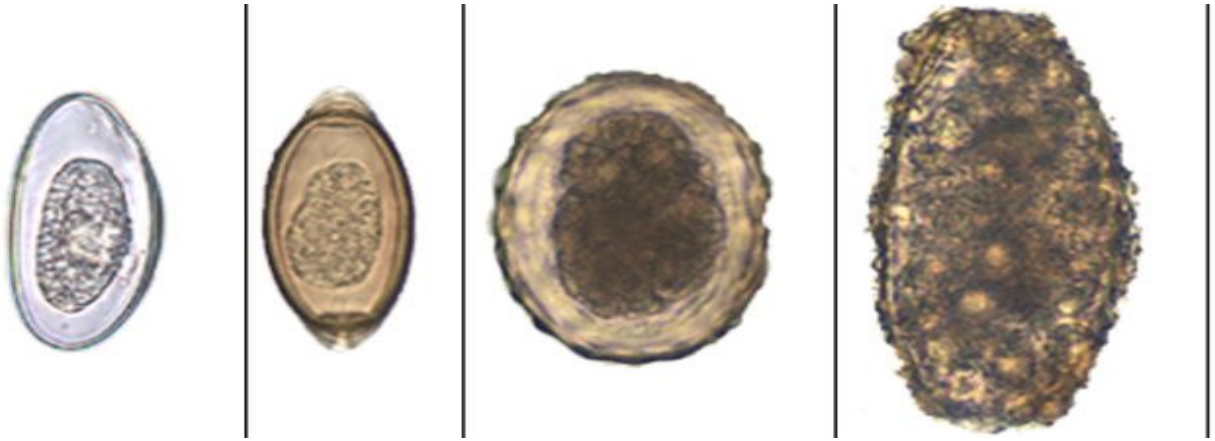
T.brucei/African trypanosomiasis

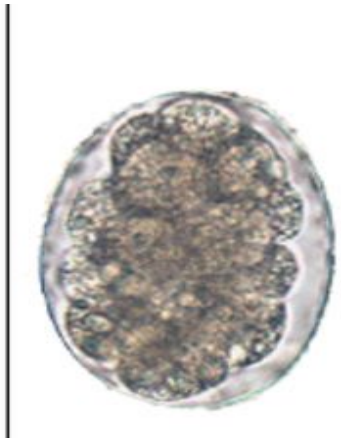
DOC-Suramin

DOC: Metrogyl

DOC: Metrogyl

Parasitology- Nematodes





Chandler's index

Parthenogenesis
Fullborne test
Smallest

Bachmann test

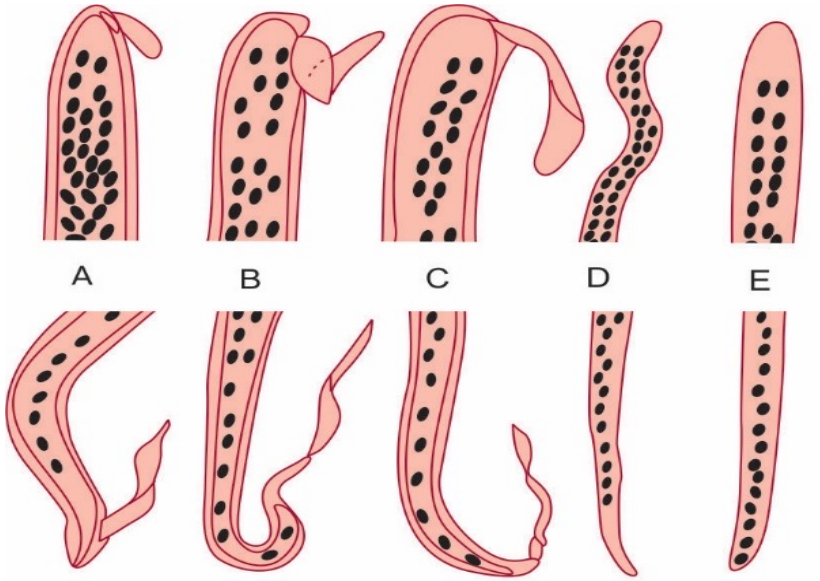
Ingested—Enterobius, Ascaris, Trichuris, Trichinella, Toxocara
Cutaneous—Strongyloides, Hookworm
Bites—Loa loa, Onchocerca volvulus, Wuchereria bancrofti

Nematodes- Filarial worms

A. Wuchereria bancrofti
B. Brugia malayi
C. Loa loa (calabar swelling-deerfly-Chrysops)
D. Onchocerca volvulus

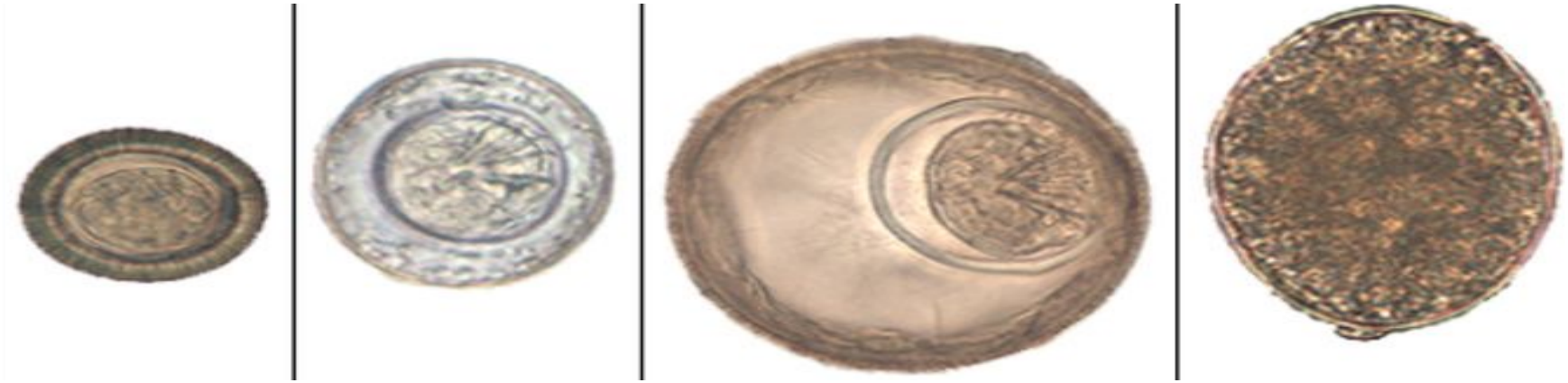
(river blindness-Blackfly/Simulium Mazzoti test)

E. Mansonella perstans



Transmission assessment survey
IOC:
DEC Provocation test
Concentration: Membrane filtration / Knott method (2% formalin)
DOC:

Parasitology- Cestodes

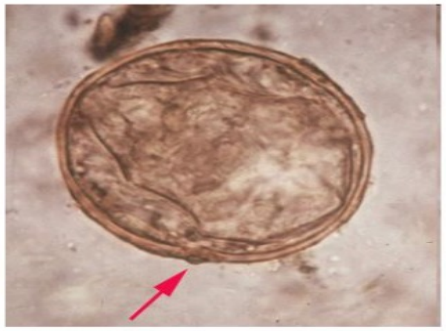


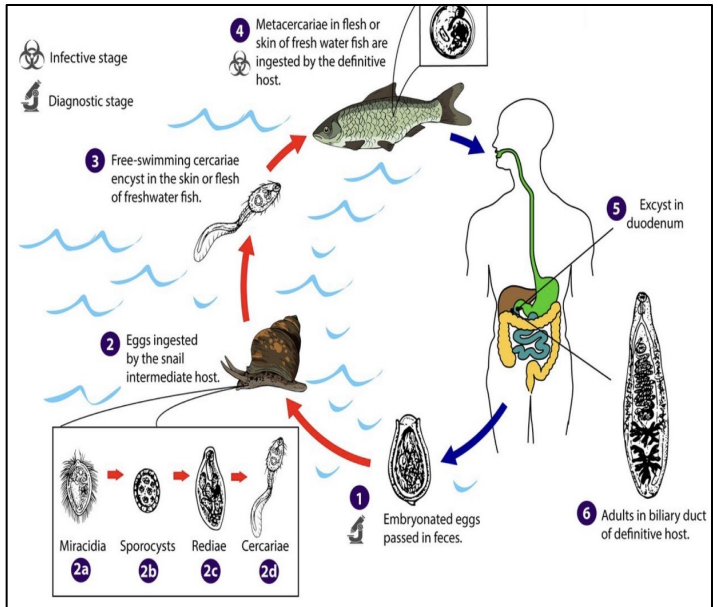
Casoni test

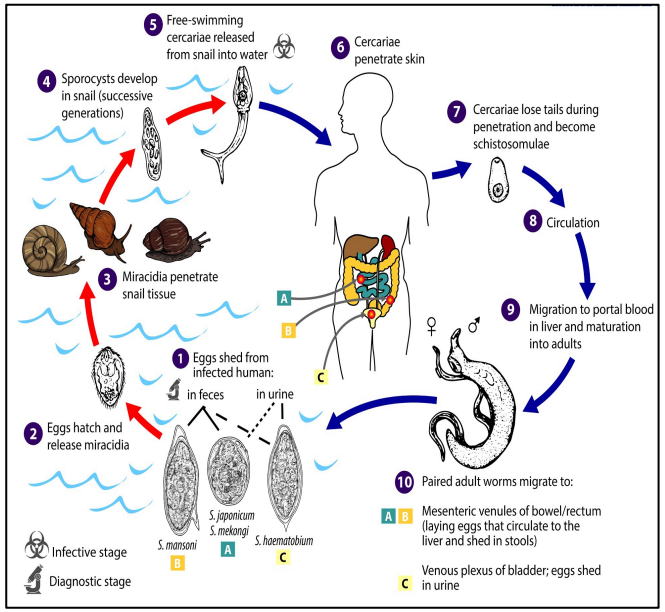
					
4 suckers 2 rows of hooks	4 suckers No hooks	4 suckers single row of 20–30 hooks	4 suckers No hooks	2 Suctorial grooves or bothria, no suckers, No hooks	4 suckers 2 rows of hooks

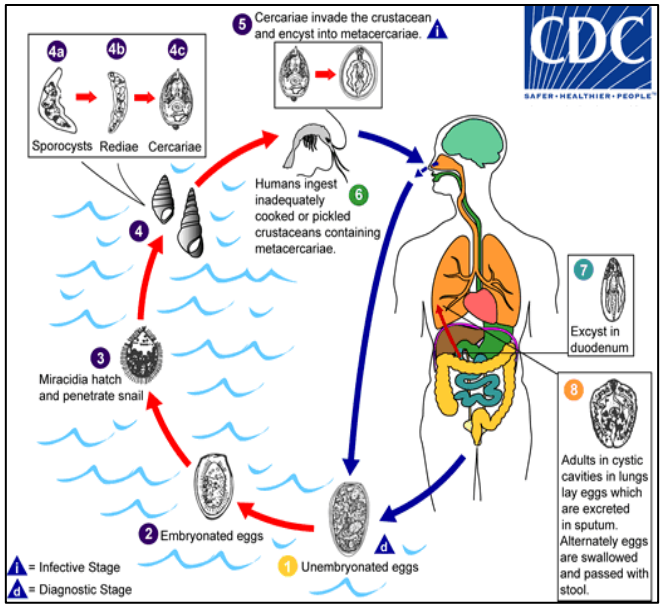
Parasitology- Trematodes

Infective form: S-
Transmission: S-
Sexes- S-
Eggs- S-
Definitive host-
Primary Intermediate-
Second Intermediate-
Paragonimus -
Opisthorchis/ Clonorchis-
Fasciola-









DOC: Cestodes, Trematodes-
Liver Fluke-
Hydatid, NCC, Nematodes-
Filaria, Loa, Loa-
Onchocerca, Strongyloides-

A 19-year-old college student presents with 1 week of fever, malaise, abdominal pain, and constipation. He recently returned from visiting relatives in India. His temperature is 39.2°C (102.6°F). Physical examination reveals a faint, salmon-colored maculopapular rash on his abdomen. Abdominal palpation shows splenomegaly and right lower quadrant tenderness.

Stool culture grows a motile, gram-negative bacillus that does not ferment lactose but produces hydrogen sulfide on triple sugar iron agar. The organism is able to survive and replicate within macrophages after being phagocytosed.

Which of the following best describes the pathogenesis of this patient's condition?

A. Preformed exotoxin-mediated enterocyte destruction

B. Enterotoxin-mediated increase in chloride secretion

C. Direct invasion of enterocytes without dissemination

D. Facultative intracellular survival within mononuclear phagocytes

Facts!

Actinomyces
Bacteroides
Clostridium

Staphylococcus
Streptococcus
Enterobacteraceae
Hemophilus
Vibrio

Helicobacter
Campylobacter
M.bovis

Biofilm:
- S. epidermidis
- Pseudomonas aeruginosa
- Nontypeable H. influenzae
- Viridans streptococci

Chlamydia
Rickettsia /Coxiella

Salmonella, Neisseria, Brucella, Mycobacterium, Listeria, Francisella, Legionella, Yersinia pestis, Bartonella
"Some Nasty Bugs May Live FacultativeLY"

Proteus, Cryptococcus, H pylori, Ureaplasma, Nocardia, Klebsiella, S epidermidis,S saprophyticus

Polysaccharide: SHiN, Pseudomonas, E.coli, Salmonella, Klebsiella, Grp B Strep
Hyaluronic acid:
Polypeptide:

Bipolar staining:

An 18-year-old boy from Rajasthan weighing 50 kg is diagnosed with mixed P. vivax and P. falciparum malaria. What is the appropriate treatment regimen on day 2? (NEET PG 2024)

A. Artesunate 50 mg (4 tablets) + Primaquine 2.5 mg (6 tablets)
B. Artesunate 50 mg (4 tablets) + Primaquine 7.5 mg (6 tablets)
C. Artesunate 50 mg (4 tablets) + Sulfadoxine/pyrimethamine (750/37.5 mg) (2 tablets) + Primaquine 2.5 mg (6 tablets)
D. Artesunate 50 mg (4 tablets) + Sulfadoxine/pyrimethamine (750/37.5 mg) (2 tablets) + Primaquine 7.5 mg (6 tablets)

Malaria Rx

P. vivax/ovale	•**Chloroquine (CQ)** 25 mg/kg: DAY 1-3 + **Primaquine (PQ)** 0.25 mg/kg: DAY 1-14
P. falciparum/ malariae	All Indian States (except northeastern): ACT-SP •**Artesunate** 4 mg/kg: DAY 1-3 •**Sulfadoxine + Pyrimethamine**, 25 mg/kg + 1.25 mg/kg : ONLY DAY 1 •**Primaquine** 0.75 mg/kg: ONLY DAY 2 Northeastern States: ACT-AL •**Artemether + Lumefantrine:** DAY 1-3 •**Primaquine** 0.75 mg/kg: ONLY DAY 2
Mixed infections: Vivax + Falciparum	•**Aretsunate** 4 mg/kg: DAY 1-3 •**Sulfadoxine + Pyrimethamine,** 25 mg/kg + 1.25 mg/kg : ONLY DAY 1 •**Primaquine** 0.25 mg/kg: DAY 1-14
COMPLICATED MALARIA (Seizures, hypoglycemia, pulmonary edema and neurological deficits)	
P. falciparum (predominantly)	Initial Treatment: **IV Artesunate** at 2.4 mg/kg for 3 days. After stabilisation: State based **Oral Artemisinin-based Combination Therapy (ACT)** for 3 days.
Pregnancy	

A microbiologist is mapping the bacterial chromosome using horizontal gene transfer experiments. An Escherichia coli donor strain carrying an F factor integrated into its chromosome is mated with an F– recipient strain. Conjugation is interrupted after 10 minutes. Analysis shows transfer of genes encoding lactose metabolism but not genes encoding histidine biosynthesis. Despite receiving new chromosomal genes, the recipient strain remains F–.
Which of the following best describes this process?

A. Transformation

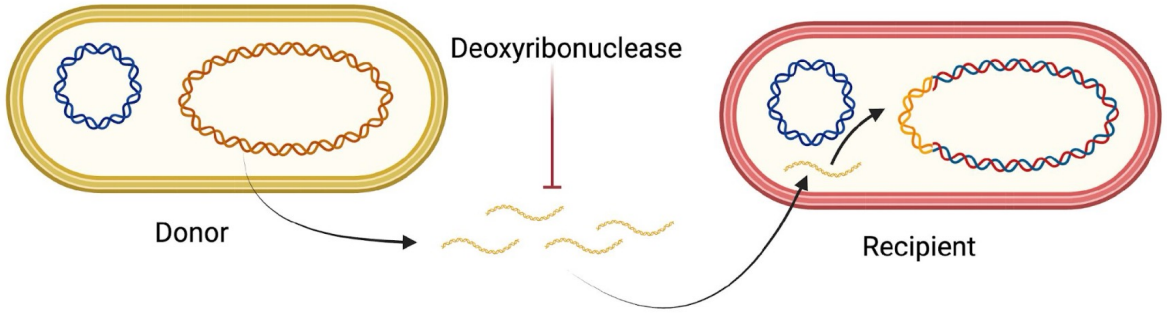
B. Specialized transduction

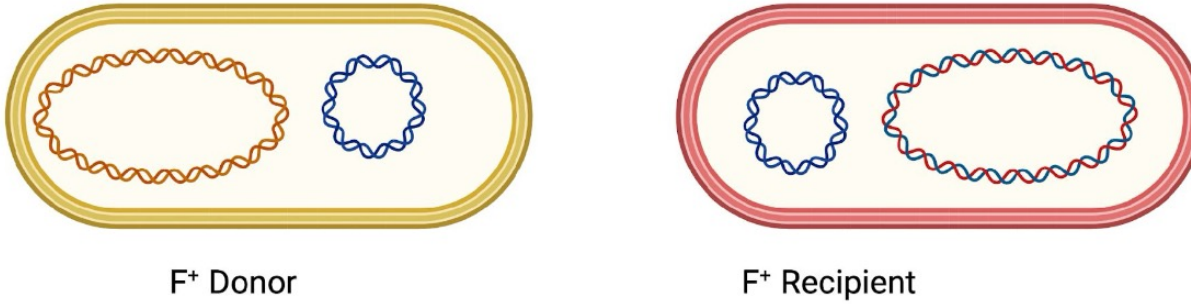
C. Hfr conjugation

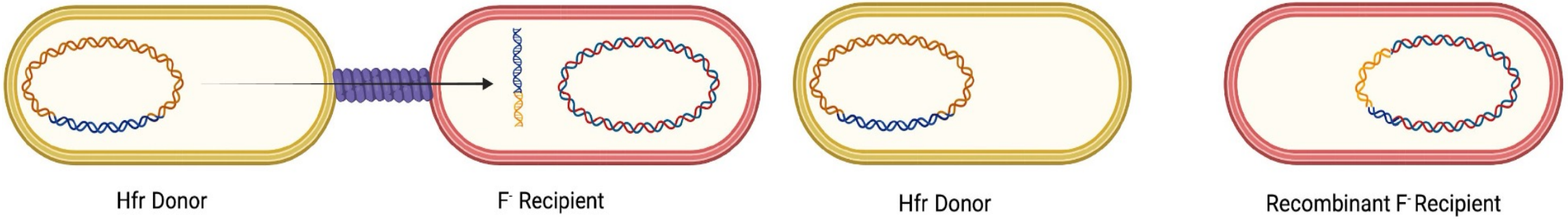
D. Standard F plasmid conjugation

A researcher is studying the virulence of Streptococcus pneumoniae. In an experiment, mice are injected with a heat-killed encapsulated strain of S. pneumoniae alone and survive. When injected with a live nonencapsulated strain alone, they also survive. However, when injected with a mixture of the heat-killed encapsulated strain and the live nonencapsulated strain, the mice die. On culture, the bacteria isolated from the dead mice are encapsulated and virulent.
Which of the following processes best explains this finding?
A. Conjugation via sex pilus
B. Transduction by bacteriophages
C. Transformation with uptake of genetic material from the environment
D. Transposition of insertion sequences within the bacterial chromosome
E. Lysogenic conversion with prophage integration

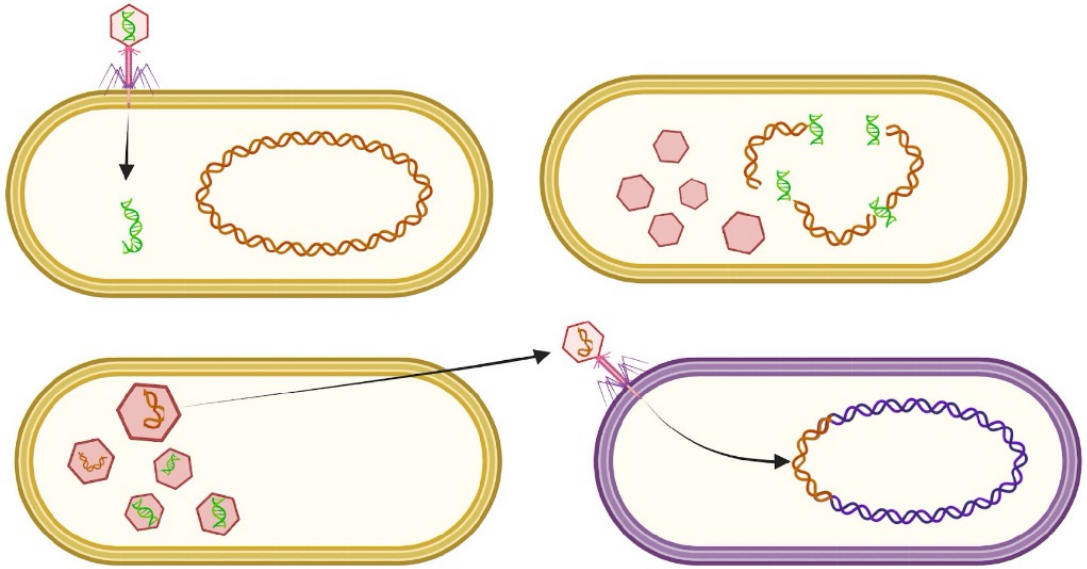
HORIZONTAL TRANSFER OF GENES

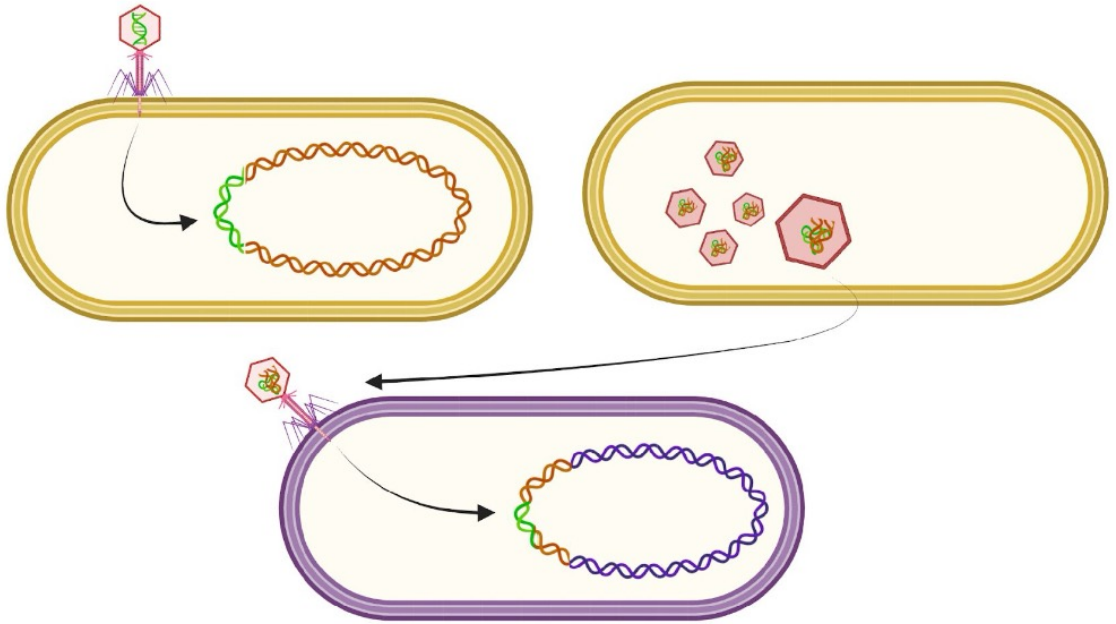




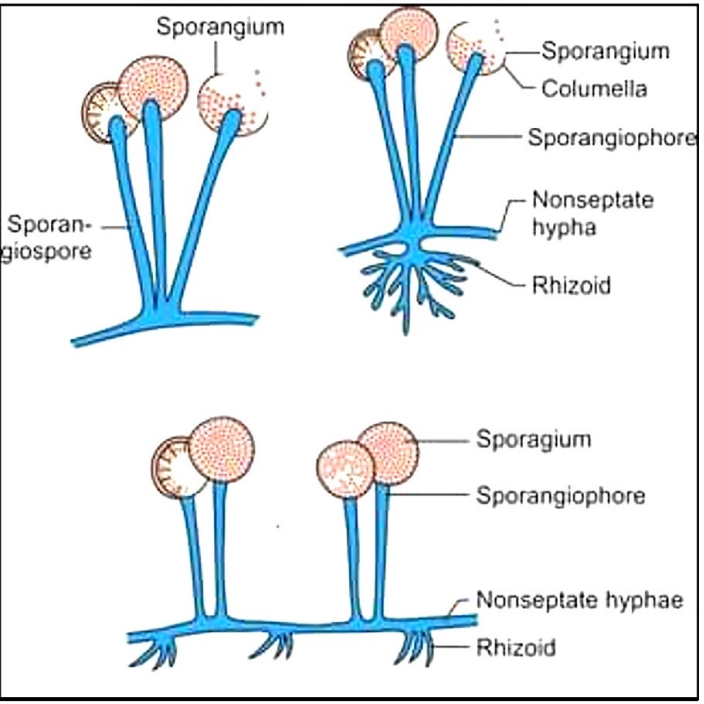


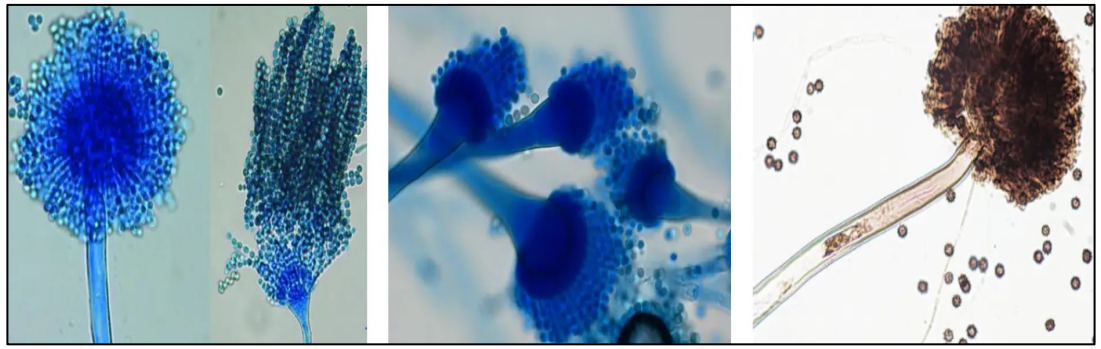
HORIZONTAL TRANSFER OF GENES

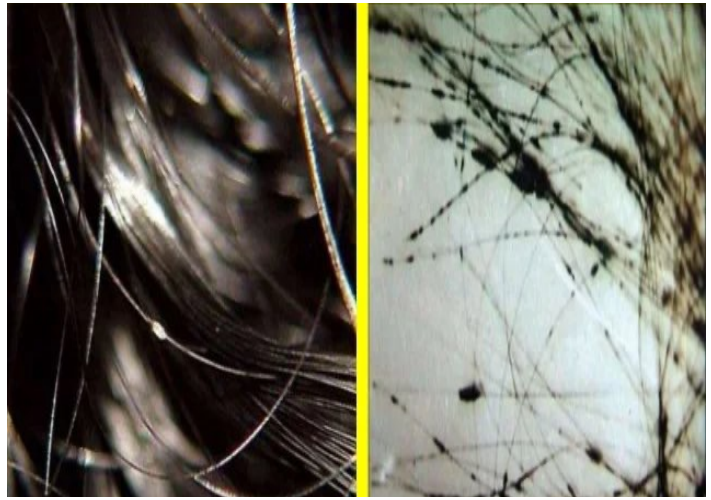




Toxins encoded in a lysogenic phage:


Sporangium
Sporangium
Columella
Sporangiophore
Sporan-
giospore
Nonseptate
hypha
Rhizoid
Sporagium
Sporangiophore
Nonseptate hyphae
Rhizoid





Precipitation/ Flocculation

- Ring test: Ascoli Lancefield
- Slide: VDRL
- Tube: Kahn
- Immunodiffusion/ Gel: Elek test
- Rocket electrophoresis

Agglutination

- Slide: Blood grouping, Rose Bengal
- Tube: Widal Weil Felix Paul-Bunnel CAT SAT MAT

- Coombs test

- Indirect/Passive agglutination:
- Latex-ASO, CRP, RF, HCG
- Heme-Rose Waaler test

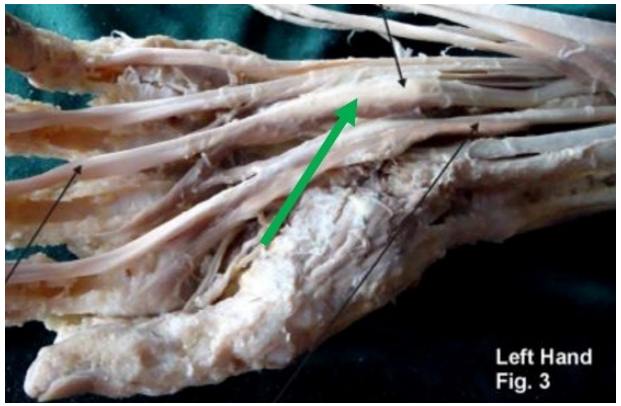
Complement fixation

Wassermann, TPI
Sabin Feldman

ANATOMY

What is the nerve supply of the structure marked by Green arrow in the image below?

A. Posterior interosseus nerve
B. Median nerve
C. Anterior interosseus nerve
D. Ulnar nerve



A 45-year-old patient presented with difficulty in foot eversion and sensory loss on the lateral leg & dorsum of foot. Which nerve lesion will lead to the following condition: (Anatomy)

A. Deep peroneal nerve
B. Sural nerve
C. Superficial peroneal nerve
D. Saphenous nerve

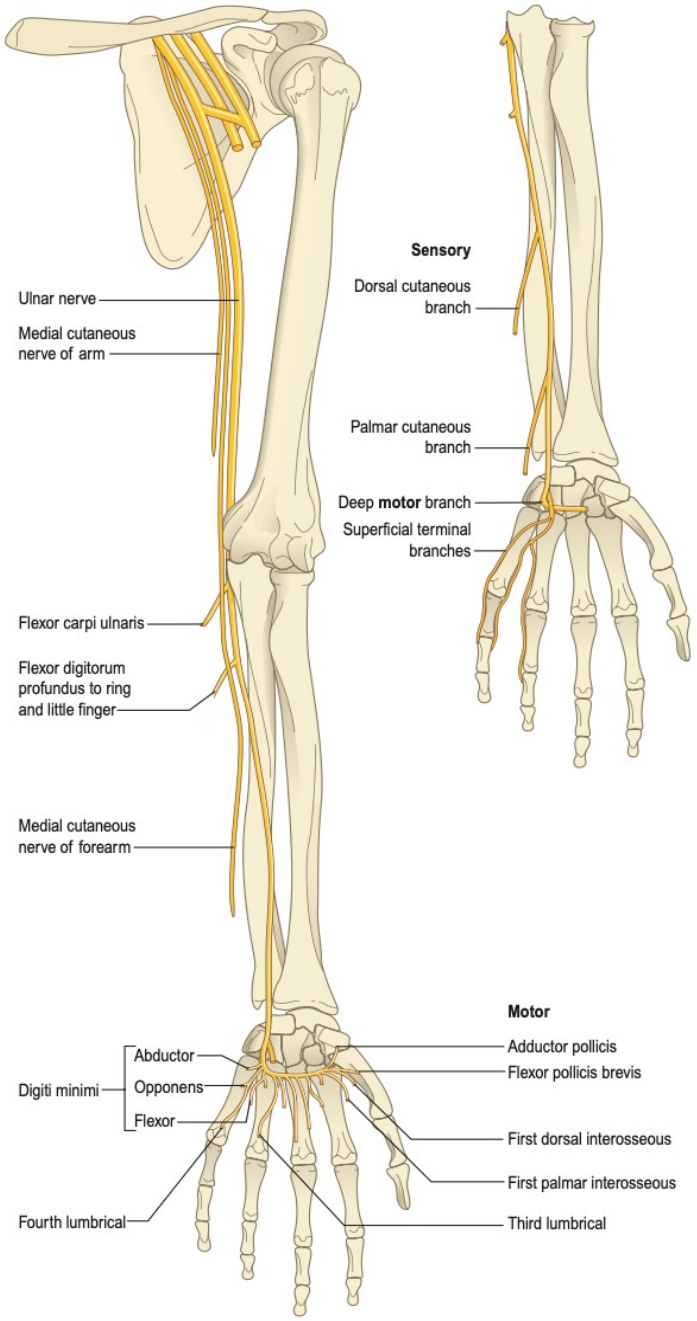
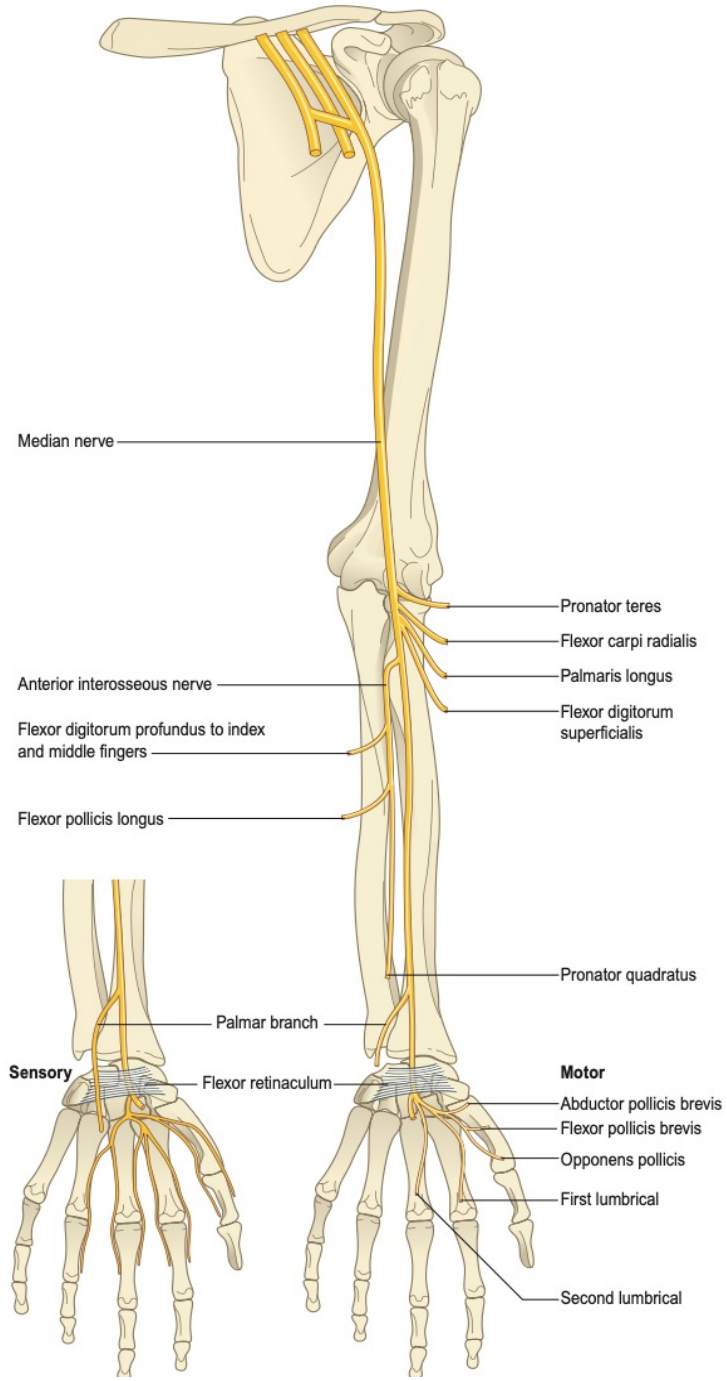


Fig. 46.12 Motor and sensory branches of the ulnar nerve and the medial cutaneous nerves of the arm and the forearm. Flexor pollicis brevis may be supplied by both median and ulnar nerves. (With permission from



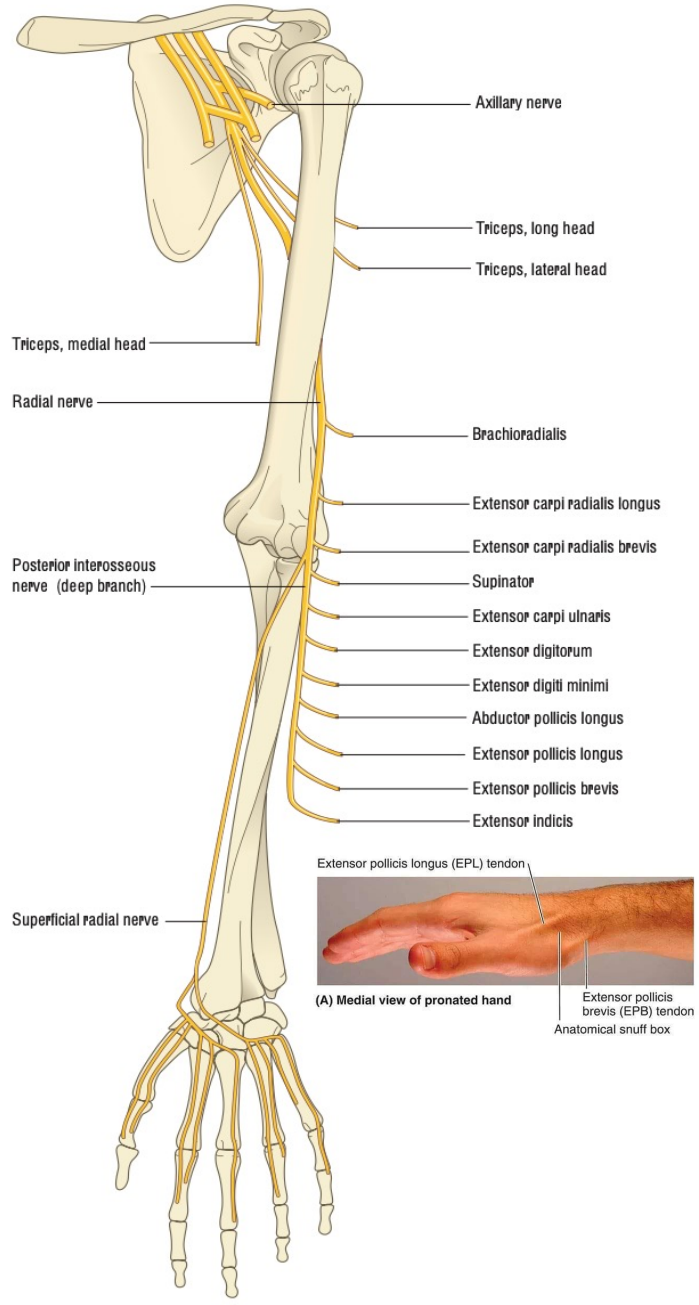
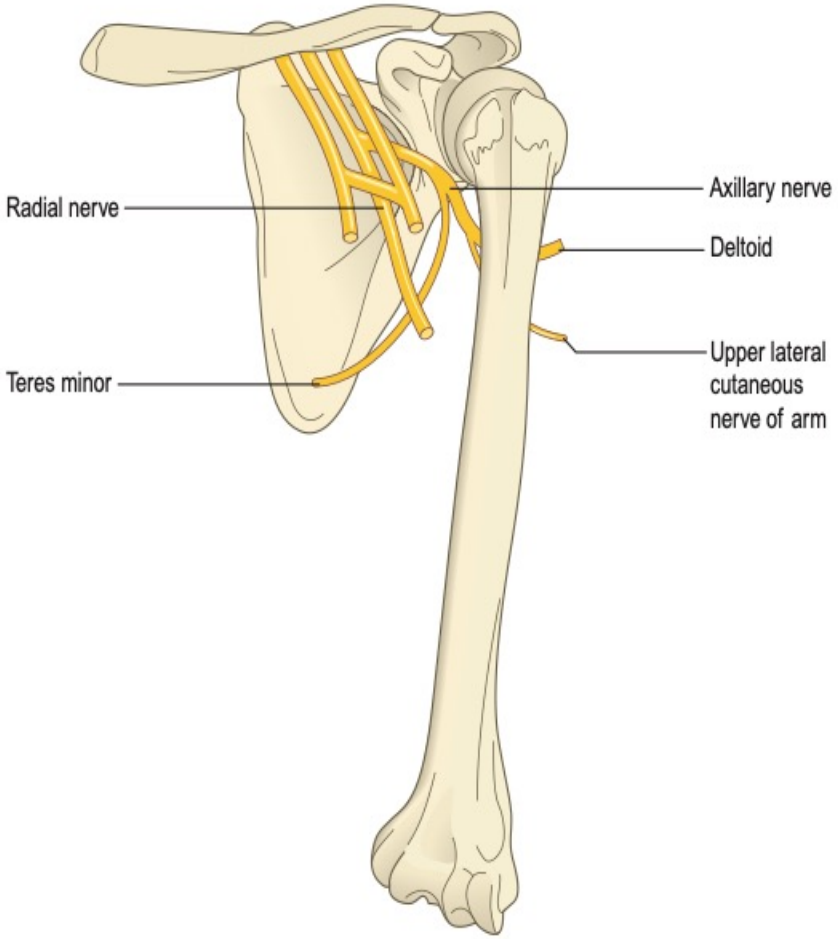
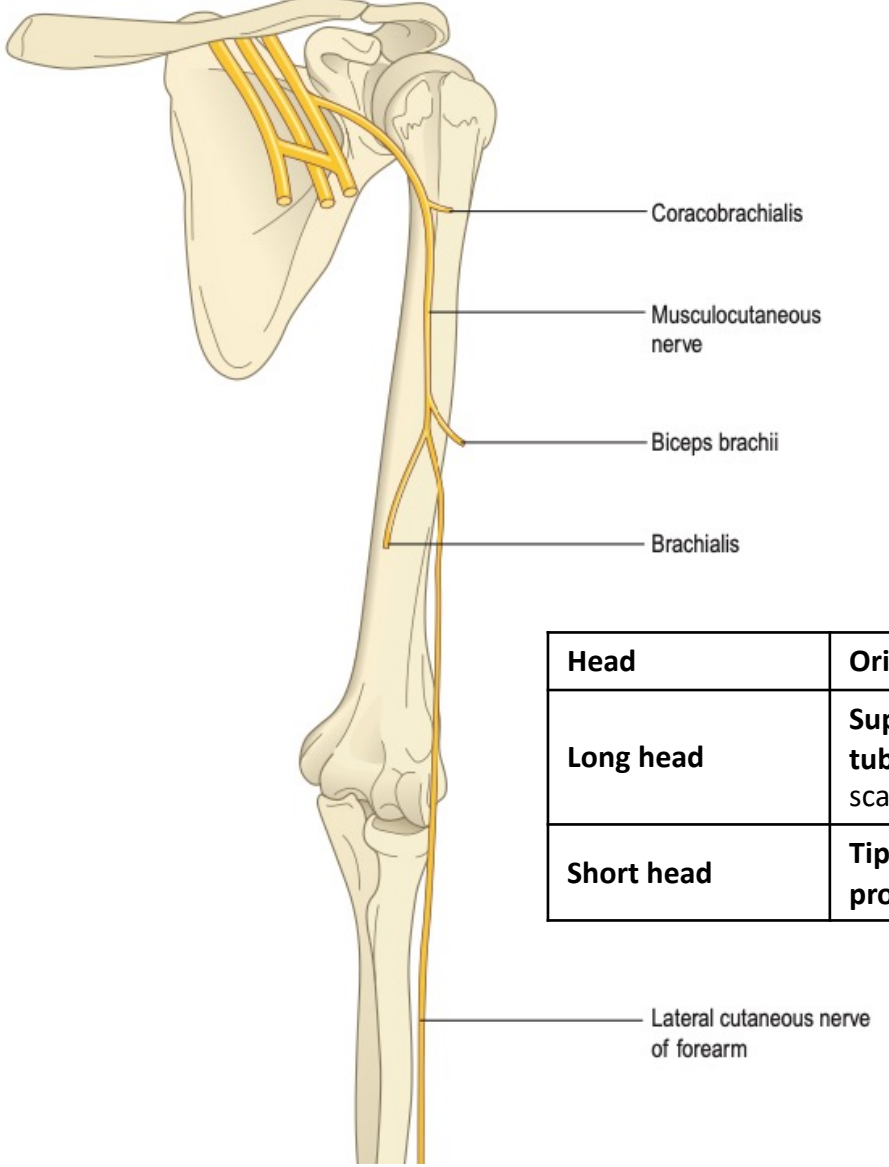


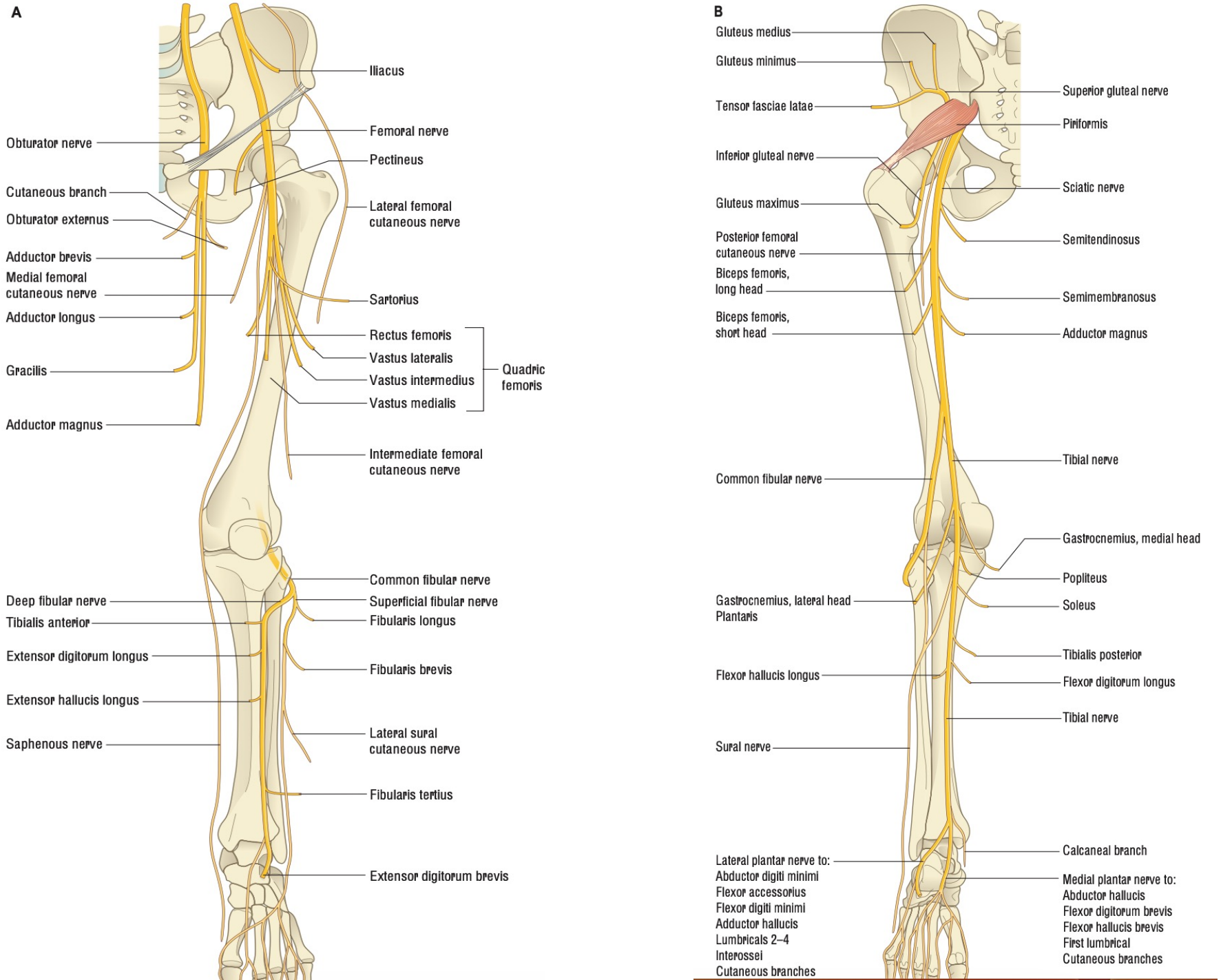
Fig. 46.9 Motor and sensory branches of the radial nerve. Variation exists in the cutaneous innervation of the dorsal aspects of the digits. Here, the radial nerve is shown to supply all five digits; the skin of the dorsum of the ring and little fingers is frequently innervated by the dorsal branch of the ulnar nerve. (With permission from O'Brien M, Aids to the Examination





Head	Origin	Insertion
Long head	**Supraglenoid tubercle** of scapula	**Radial tuberosity**
Short head	**Tip of coracoid process** of scapula	**Radial tuberosity**

Head	Origin	Insertion
Long head	**Infraglenoid tubercle** of scapula	**Olecranon process of ulna**
Lateral head	**Posterior humerus** (above radial groove)	**Olecranon process of ulna**
Medial head	**Posterior humerus** (below radial groove)	**Olecranon process of ulna**


A
Iliacus
Femoral nerve
Obturator nerve
Pectineus
Cutaneous branch
Lateral femoral cutaneous nerve
Obturator externus
Adductor brevis
Medial femoral cutaneous nerve
Sartorius
Adductor longus
Rectus femoris
Vastus lateralis
Quadric femoris
Gracilis
Vastus intermedius
Vastus medialis
Adductor magnus
Intermediate femoral cutaneous nerve
Common fibular nerve
Deep fibular nerve
Superficial fibular nerve
Tibialis anterior
Fibularis longus
Extensor digitorum longus
Fibularis brevis
Extensor hallucis longus
Lateral sural cutaneous nerve
Saphenous nerve
Fibularis tertius
Extensor digitorum brevis
B
Gluteus medius
Gluteus minimus
Superior gluteal nerve
Tensor fasciae latae
Piriformis
Inferior gluteal nerve
Sciatic nerve
Gluteus maximus
Posterior femoral cutaneous nerve
Semitendinosus
Biceps femoris, long head
Semimembranosus
Biceps femoris, short head
Adductor magnus
Tibial nerve
Common fibular nerve
Gastrocnemius, medial head
Popliteus
Gastrocnemius, lateral head
Plantaris
Soleus
Tibialis posterior
Flexor hallucis longus
Flexor digitorum longus
Tibial nerve
Sural nerve
Calcaneal branch
Lateral plantar nerve to:
Abductor digiti minimi
Flexor accessorius
Flexor digiti minimi
Adductor hallucis
Lumbricals 2–4
Interossei
Cutaneous branches
Medial plantar nerve to:
Abductor hallucis
Flexor digitorum brevis
Flexor hallucis brevis
First lumbrical
Cutaneous branches

Which of the following areas is not a part of anterior neck?

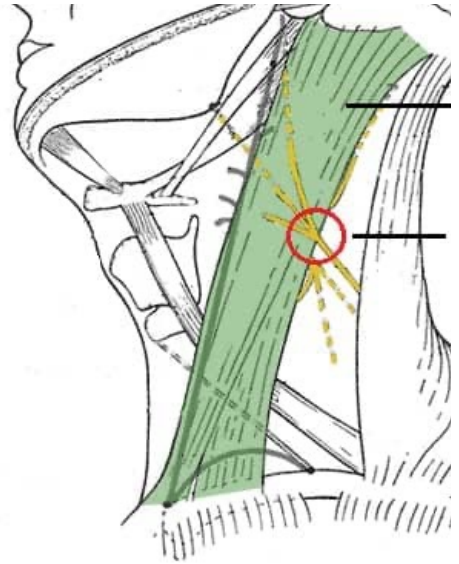
A) Subclavian triangle
B) Submental triangle
C) Digastric triangle
D) Carotid triangle

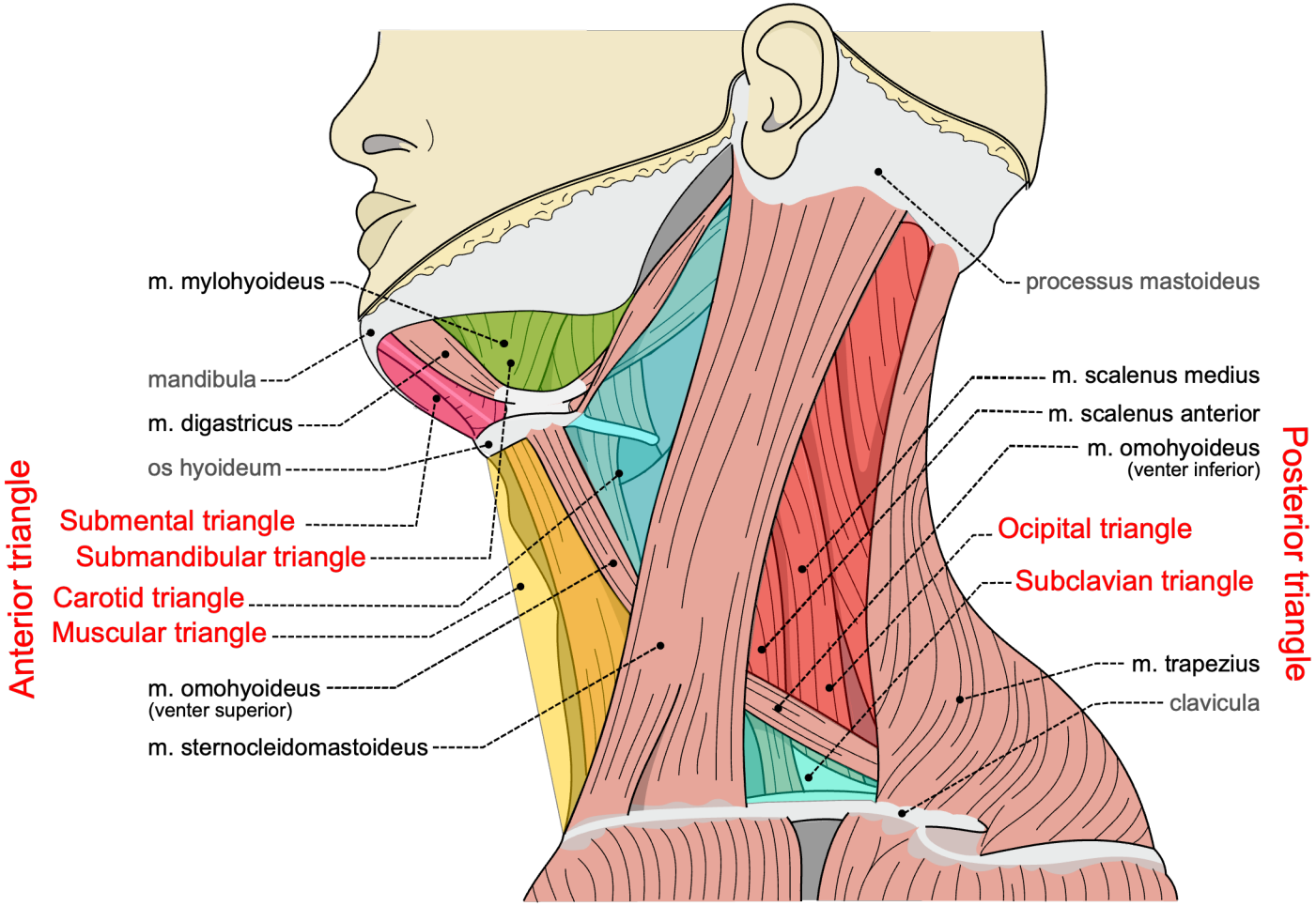
The deep cervical fascia's pretracheal layer encloses everything except:

A. Sternocleidomastoid
B. Esophagus
C. Trachea
D. Thyroid gland

All of the following are true about the marked point except:

a) Lies in front of the transverse process of the sixth cervical vertebra
b) Blocking this point leads to weakness of sternocleidomastoid
c) Landmark in the neck where the spinal accessory nerve emerges into the posterior triangle
d) Formed by the C5 and C6 nerve roots, and the cutaneous branches of the cervical plexus




Anterior triangle
m. mylohyoideus
mandibula
m. digastricus
os hyoideum
Submental triangle
Submandibular triangle
Carotid triangle
Muscular triangle
m. omohyoideus
(venter superior)
m. sternocleidomastoideus
processus mastoideus
m. scalenus medius
m. scalenus anterior
m. omohyoideus
(venter inferior)
Ocipital triangle
Subclavian triangle
m. trapezius
clavicula
Posterior triangle

ANATOMY OF HEAD AND NECK IMAGING

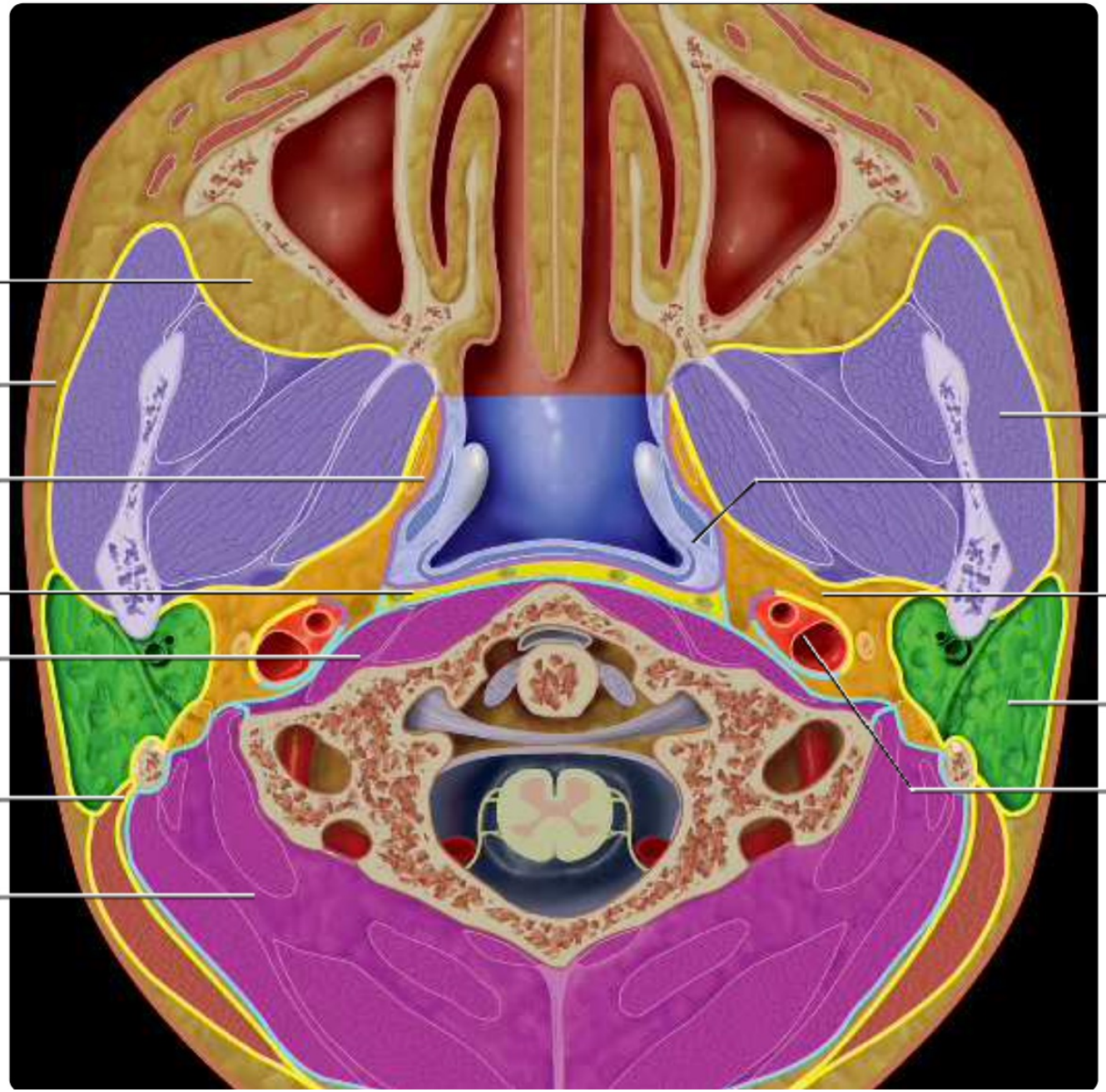
Superficial Fascia

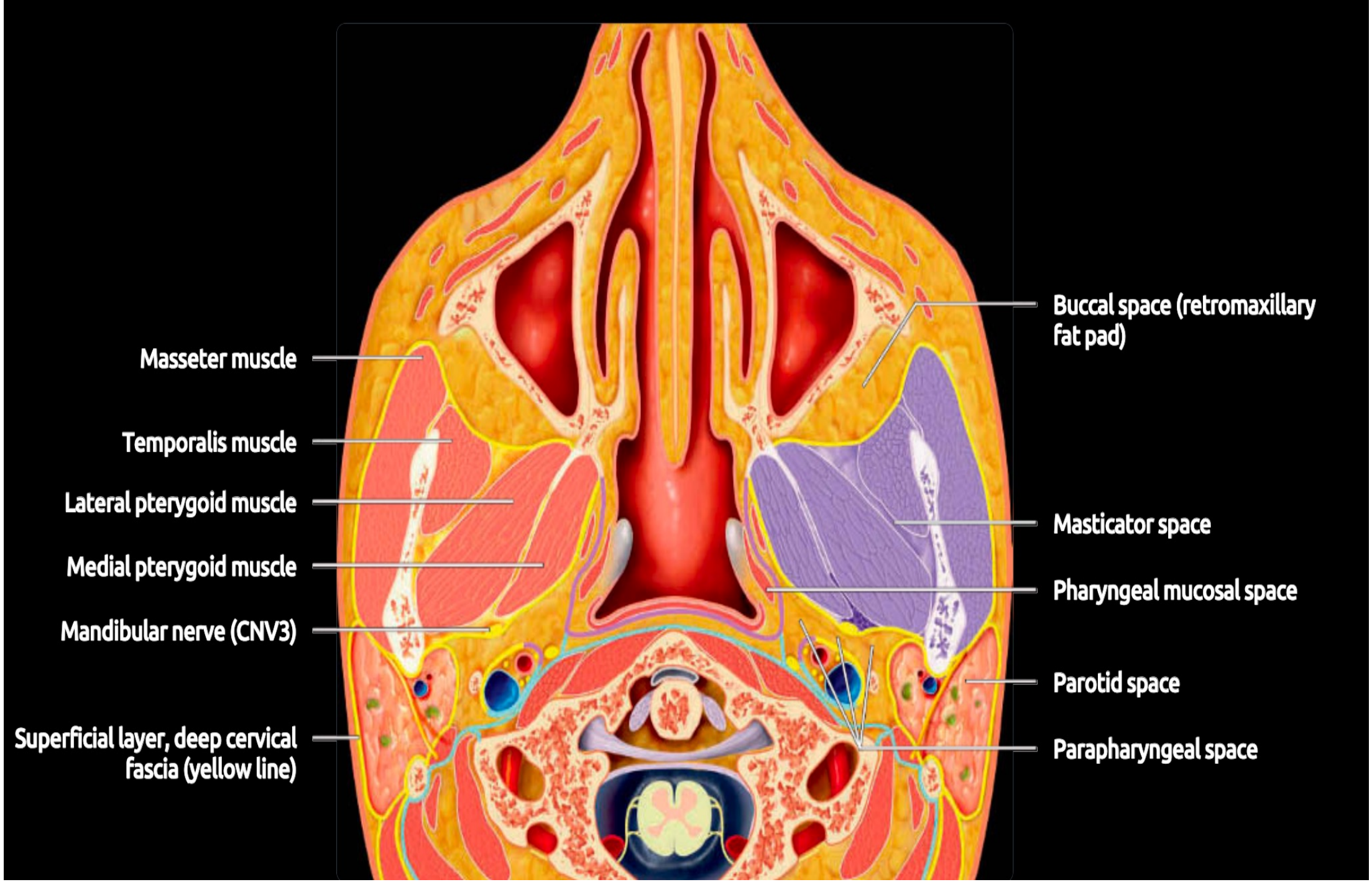
Deep Fascia

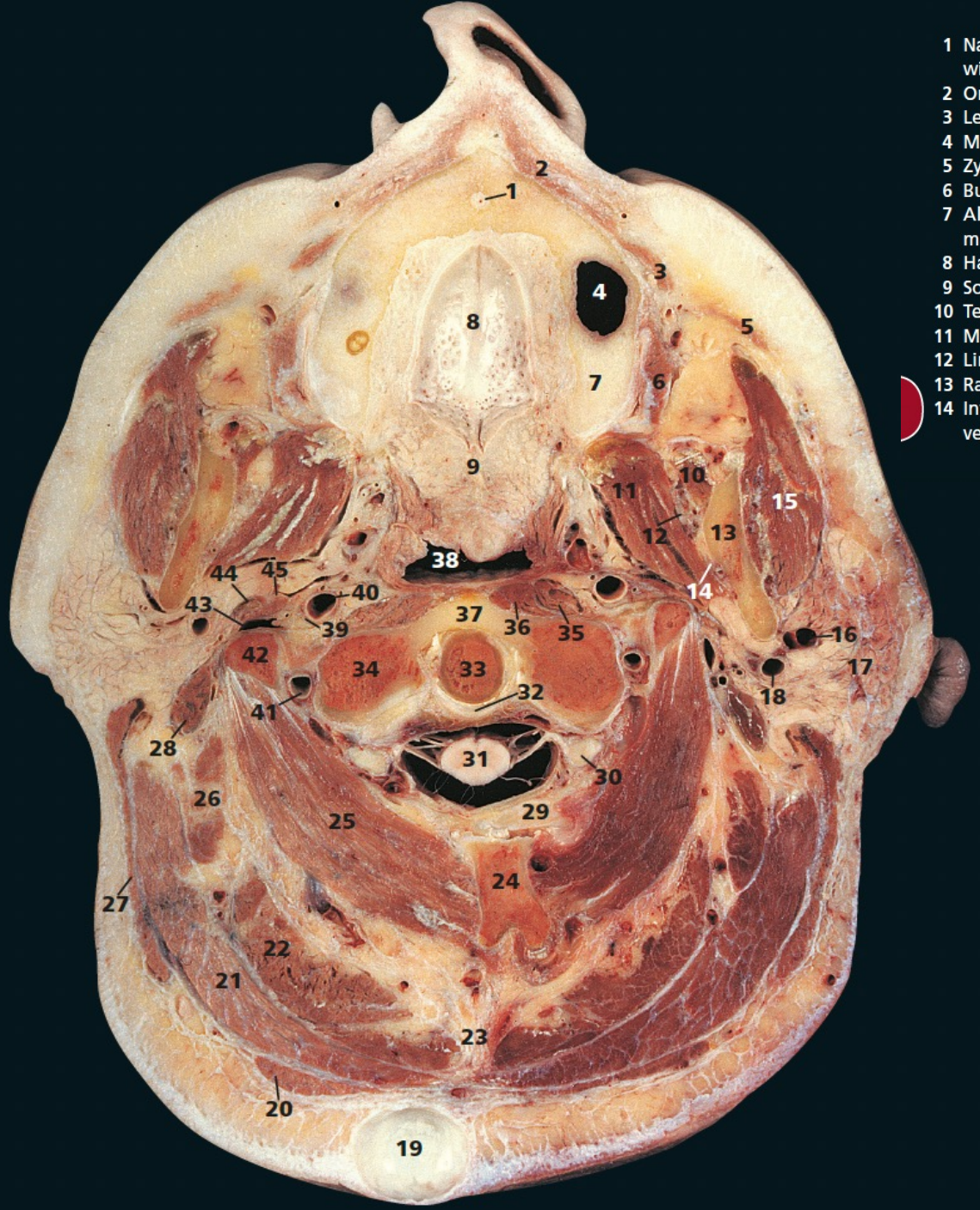
Superficial/Investing

Middle/Visceral

Deep/Prevertebral


Buccal space, retromaxillary fat pad
Superficial layer, deep cervical fascia
Middle layer, deep cervical fascia
Retropharyngeal space
Perivertebral space, prevertebral component
Deep layer, deep cervical fascia
Perivertebral space, paraspinal component
Masticator space
Pharyngeal mucosal space/surface
Parapharyngeal space
Parotid space
Carotid space


Masseter muscle
Temporalis muscle
Lateral pterygoid muscle
Medial pterygoid muscle
Mandibular nerve (CNV3)
Superficial layer, deep cervical fascia (yellow line)
Buccal space (retromaxillary fat pad)
Masticator space
Pharyngeal mucosal space
Parotid space
Parapharyngeal space



1 Nasopalatine nerve (V^{ii}) within incisive canal
2 Orbicularis oris
3 Levator angulis oris
4 Maxillary antrum
5 Zygomaticus major
6 Buccinator
7 Alveolar process of maxilla
8 Hard palate
9 Soft palate
10 Temporalis
11 Medial pterygoid
12 Lingual nerve (V^{iii})
13 Ramus of mandible
14 Inferior alveolar artery vein and nerve
15 Masseter
16 Retromandibular vein
17 Parotid gland
18 External carotid artery
19 Dermoid cyst of scalp
20 Trapezius
21 Splenius capitis
22 Semispinalis capitis
23 Ligamentum nuchae
24 Spine of axis
25 Obliquus capitis inferior
26 Longissimus capitis
27 Sternocleidomastoid
28 Posterior belly of digastric
29 Posterior arch of atlas (first cervical vertebra)
30 Dorsal root ganglion of second cervical nerve
31 Spinal cord within dural sheath
32 Transverse ligament of atlas
33 Dens of axis (odontoid process of second cervical vertebra)
34 Lateral mass of atlas (first cervical vertebra)
35 Longus capitis
36 Longus colli
37 Anterior arch of atlas (first cervical vertebra)
38 Nasopharynx
39 Vagus nerve (X) and hypoglossal nerve (XII)
40 Internal carotid artery
41 Vertebral artery
42 Transverse process of atlas (first cervical vertebra)
43 Internal jugular vein
44 Styloid process, with origins of styloglossus and stylohyoid and glossopharyngeal nerve (IX)
45 Stylopharyngeus

Which of the following is a Y-shaped ligament that connects the calcaneum to the cuboid and navicular bone?

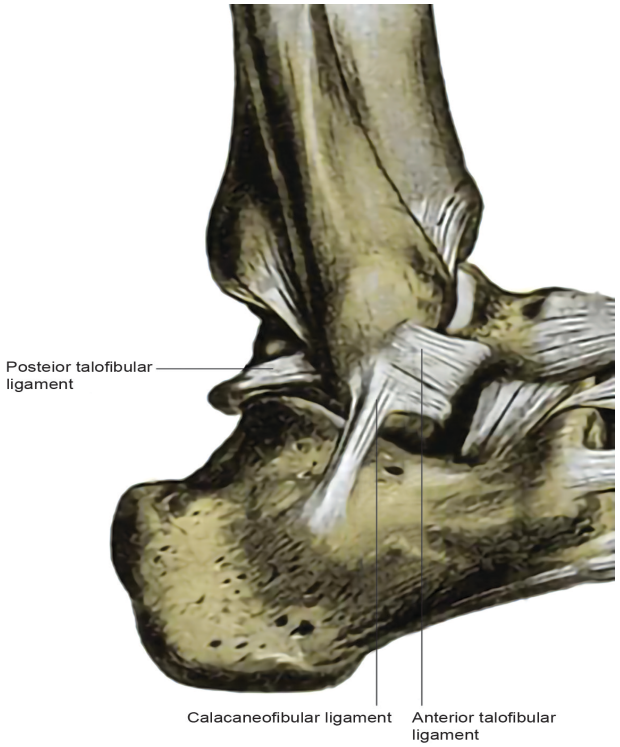
A) Lisfranc
B) Spring
C) Chopart
D) Deltoid

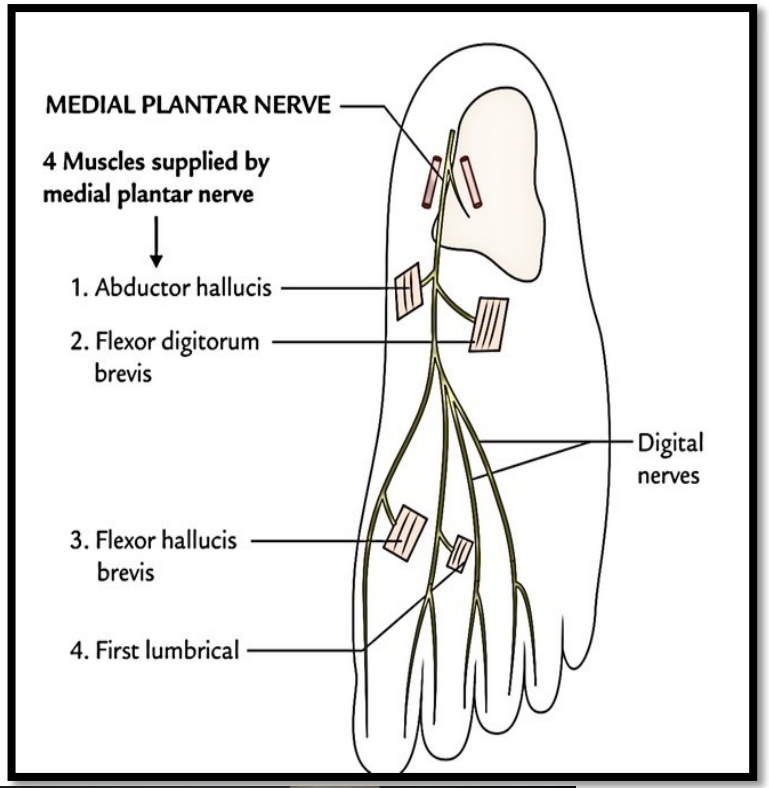
Which of the following muscles are supplied by the lateral plantar nerve?

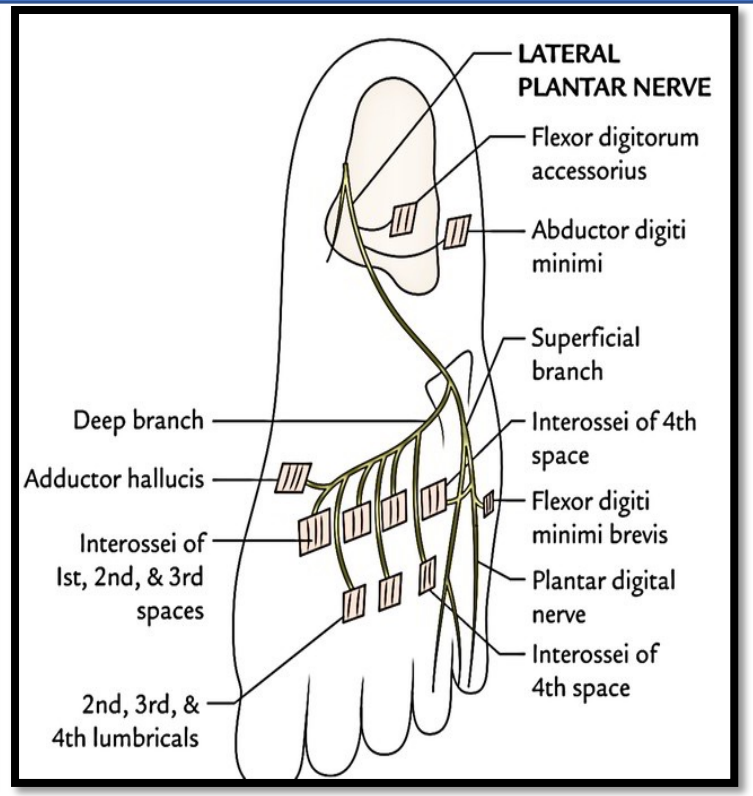
1. Abductor hallucis
2. Flexor digitorum accessorius
3. Flexor hallucis brevis
4. First lumbrical
5. First interossei

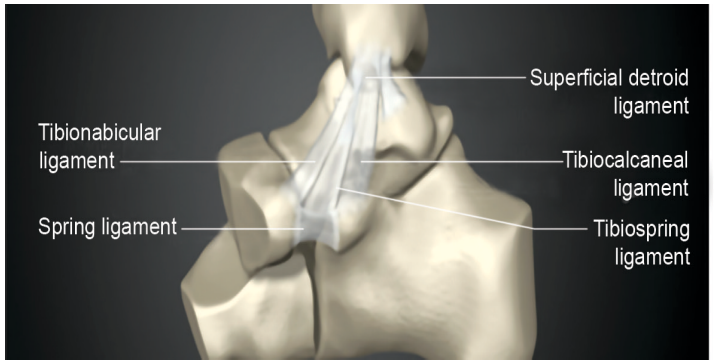
A. 2 and 5
B. 3 and 4
C. 1 and 3
D. 2 and 4

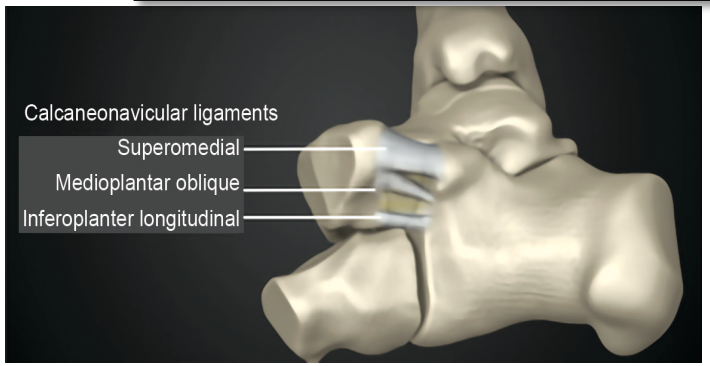
Ankle and foot











A chest CT scan is performed on a 35-year-old man who presented with chronic cough and weight loss. Which of the following structures labelled below is a derivative of the common cardinal veins?

A)A
B) B
C) C
D) D

A 38-year-old male patient presents with a 6-month history of progressive dyspnea on exertion and occasional chest pain. Physical examination reveals elevated jugular venous pressure and a diastolic murmur heard at the left sternal border. An echocardiogram confirms the diagnosis of severe aortic regurgitation. During surgery to repair the aortic valve, the surgeon encounters the left superior intercostal vein. Which vessel is most likely to receive the blood drained by the left superior intercostal vein in this patient?

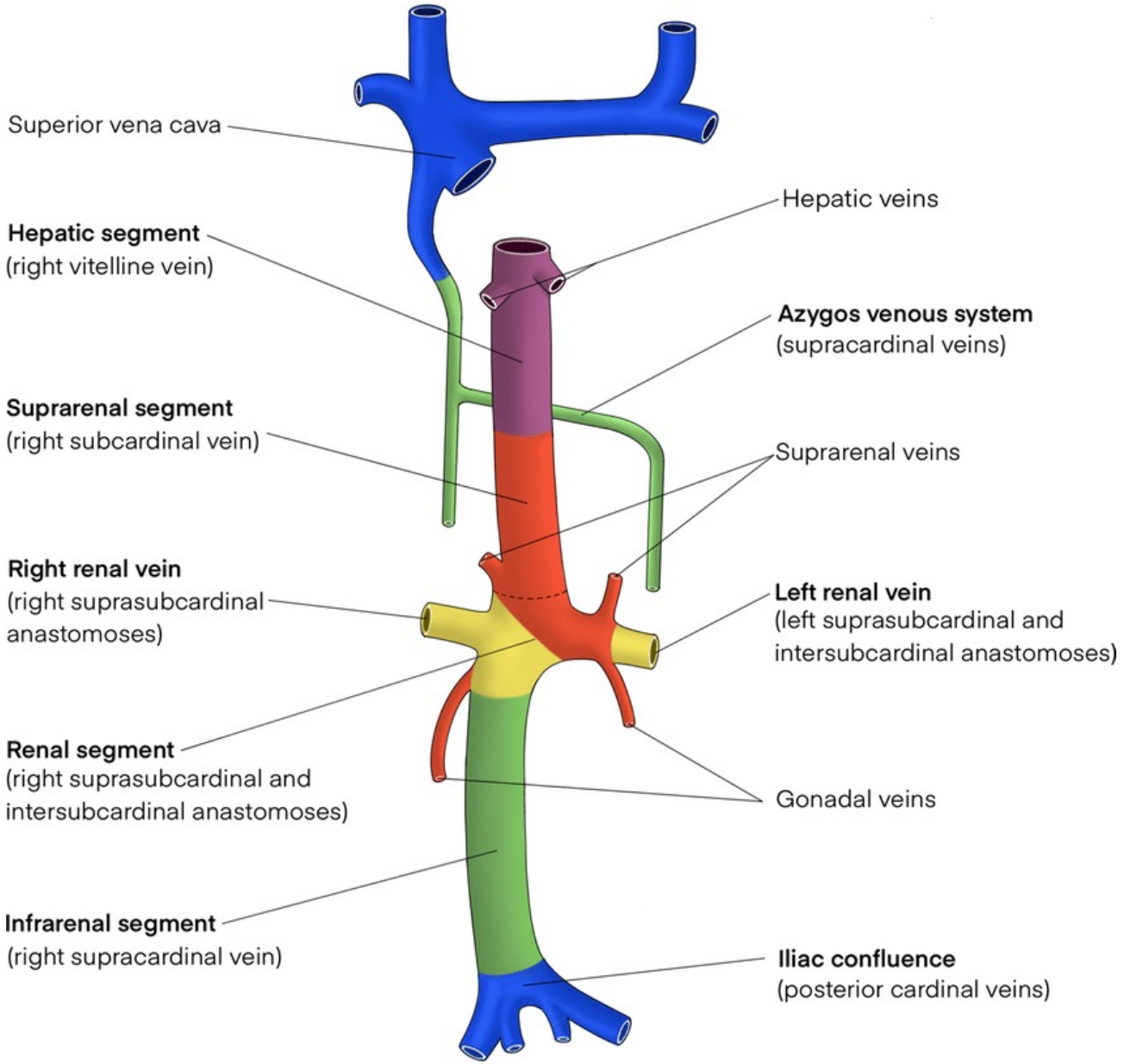
A. Hemiazygos Vein
B. Brachiocephalic Vein
C. Azygos Vein
D. Internal Thoracic Vein

Venous system derivatives

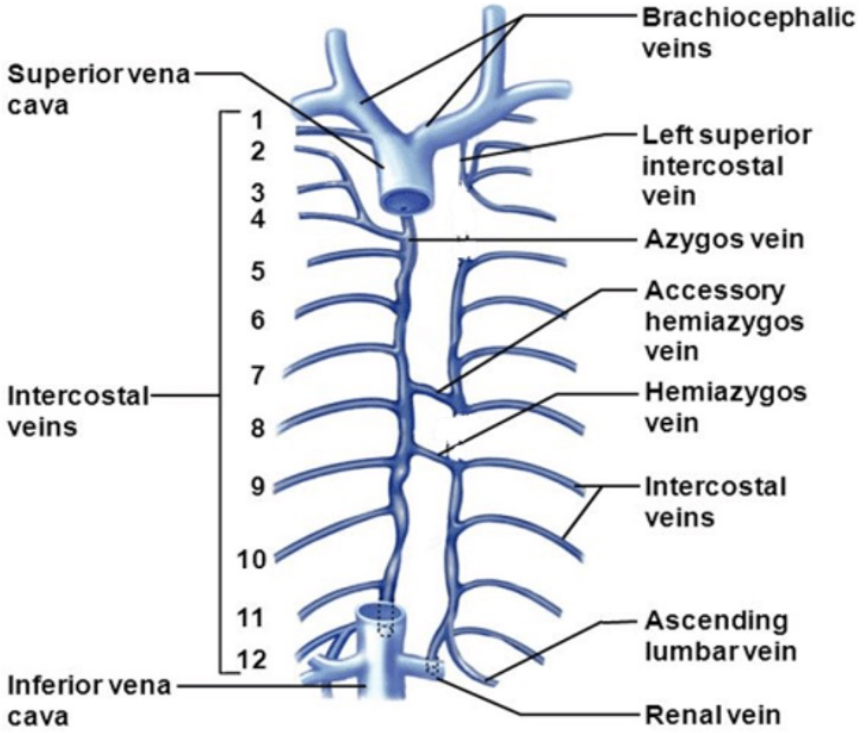
Supracardinal Vein:

Subcardinal Vein:

Sub-Supracardinal Anastamosis:



Azygos-Hemiazygos vein



Formed by: Right Lumbar azygos, right subcostal, right ascending lumbar
Tributaries:
Right superior intercostal vein: 2,3,4 PICV
Right 5-11th PICV
Hemiazygos, Accessory hemiazygos-T8
T4->SVC

Formed by: left Lumbar azygos, left subcostal, left ascending lumbar
Tributaries:
Left 9-11th PICV

Tributaries:
Left 5-8^{h} PICV

Which among the following does not constitute a part of superficial perineal pouch?

A. Sphincter urethrae
B. Bulbospongiosus
C. Posterior scrotal nerves
D. Duct of bulbourethral glands

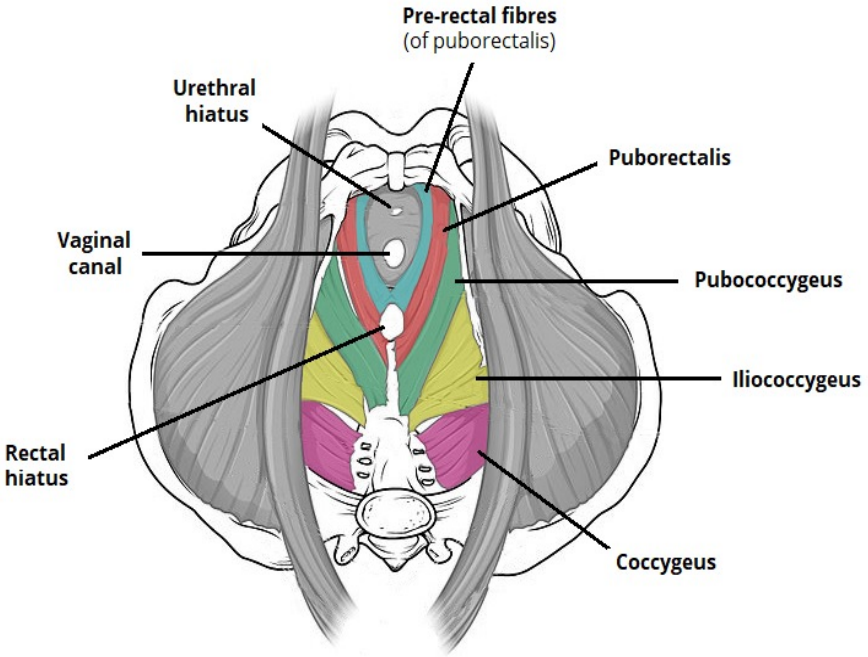
Which of the following muscles is not involved in the formation of the perineal body?

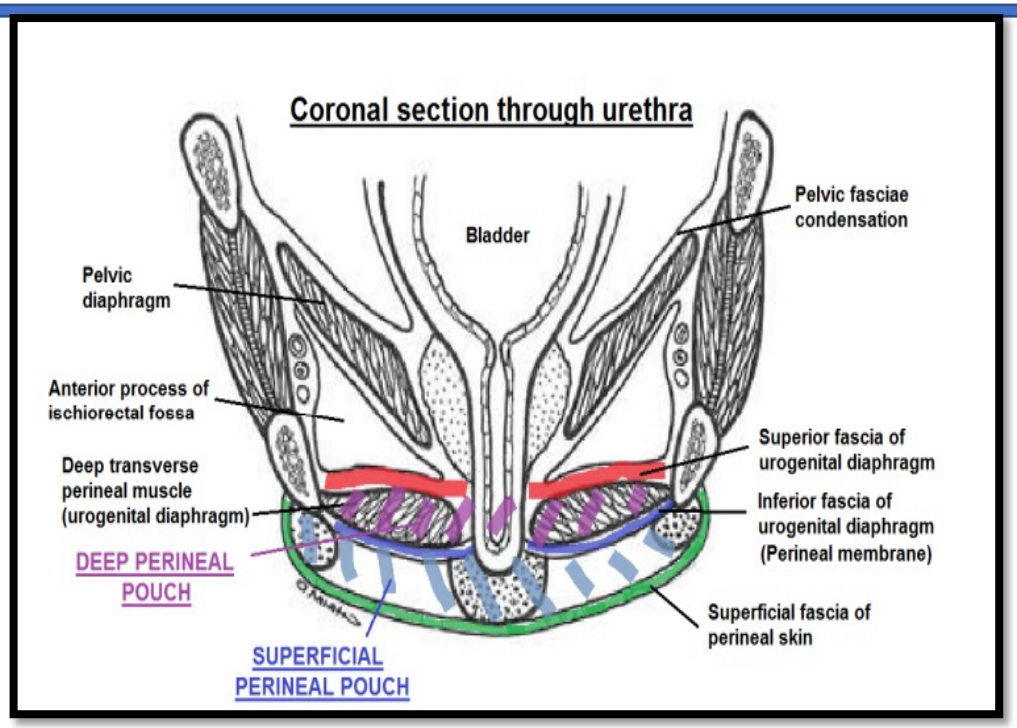
1. Bulbospongiosus muscle
2. Superficial transverse perineal muscles
3. Deep transverse perineal muscles
4. Internal anal sphincter muscle

A 46-year-old woman has a history of infection in her perineal region. A comprehensive examination reveals a tear of the superior boundary of the superficial perineal space. Which of the following structures would most likely be injured?

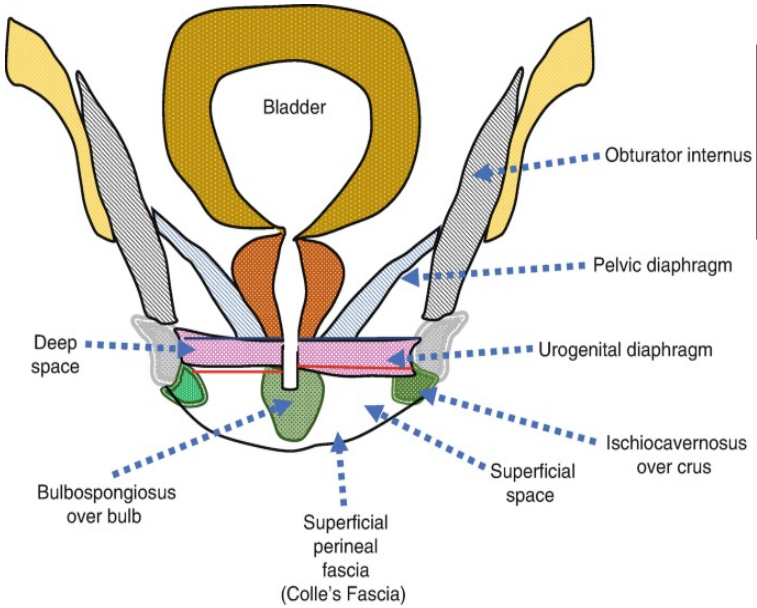
A. Pelvic diaphragm
B. Colles fascia
C. Deep perineal fascia
D. Perineal membrane

PELVIS


Pre-rectal fibres
(of puborectalis)
Urethral hiatus
Puborectalis
Vaginal canal
Pubococcygeus
Iliococcygeus
Rectal hiatus
Coccygeus


Coronal section through urethra
Bladder
Pelvic fasciae condensation
Pelvic diaphragm
Anterior process of ischiorectal fossa
Deep transverse perineal muscle (urogenital diaphragm)
Superior fascia of urogenital diaphragm
Inferior fascia of urogenital diaphragm (Perineal membrane)
DEEP PERINEAL POUCH
Superficial fascia of perineal skin
SUPERFICIAL PERINEAL POUCH

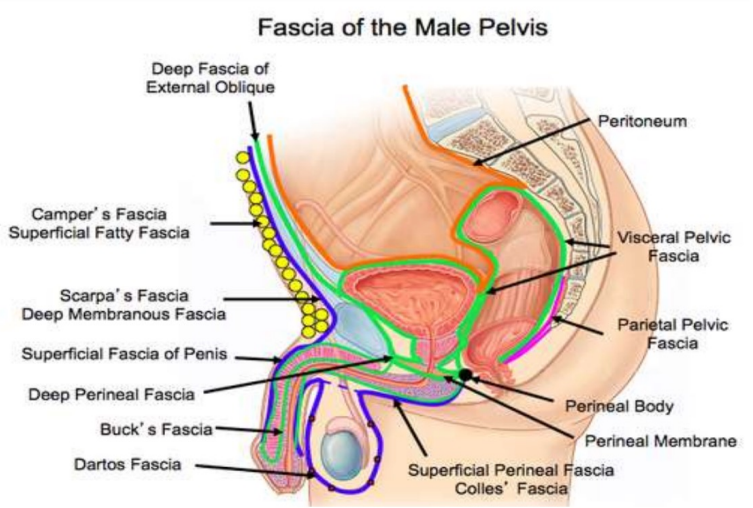
DEEP PERINEAL POUCH



Deep perineal pouch:
Sphincter urethra
Deep transverse perinii

Male	Female
• Membranous urethra • Bulbourethral (Cowper's) glands	• Part of urethra • Part of vagina
• Internal pudendal artery • Artery of bulb • Urethral artery • Perineal artery	
• Dorsal nerve of penis/ clitoris • Perineal nerve	

SUPERFICIAL PERINEAL POUCH

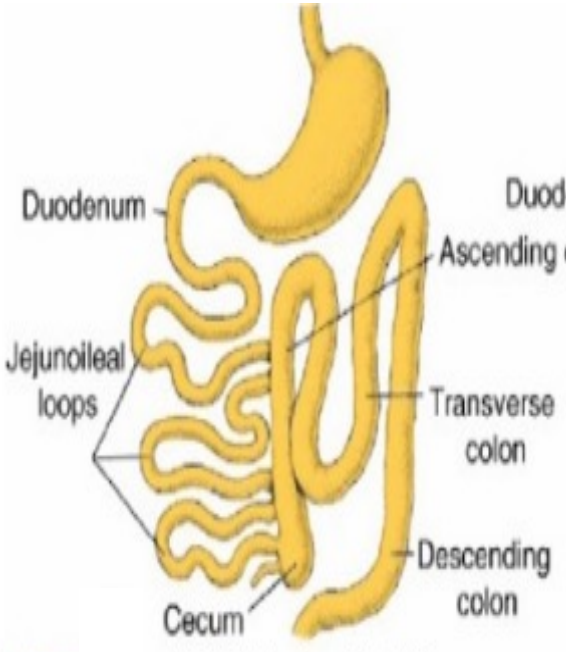


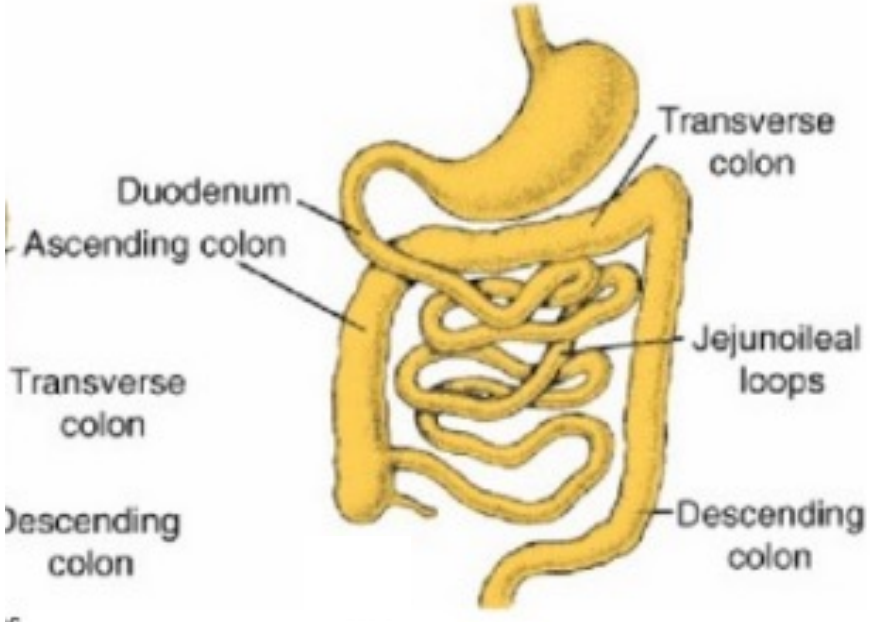
Male	Female
• Root of penis (2 crura + bulb) • Penile urethra in corpus spongiosum	• Root of clitoris (2 crura) • Two bulbs of vestibule • Greater vestibular (Bartholin) glands
• Two ischiocavernosus muscles • Bulbospongiosus muscle • Two superficial transverse perineal muscles	
• Internal pudendal artery • Dorsal artery of penis • Deep artery of penis / clitoris • Two scrotal arteries/ labial A	
• Dorsal nerve of penis/ clitoris • Two scrotal/ labial nerves	

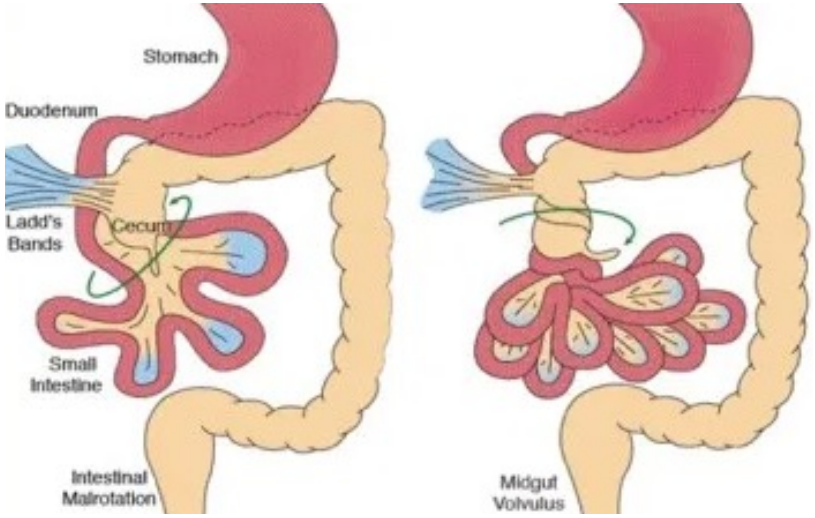
The caecum is found to be placed below the stomach and is midline. Which of the following abnormalities must have taken place while rotation of the gut?

A. Malrotation
B. Nonrotation
C. Reverse Rotation
D. Mixed Rotation

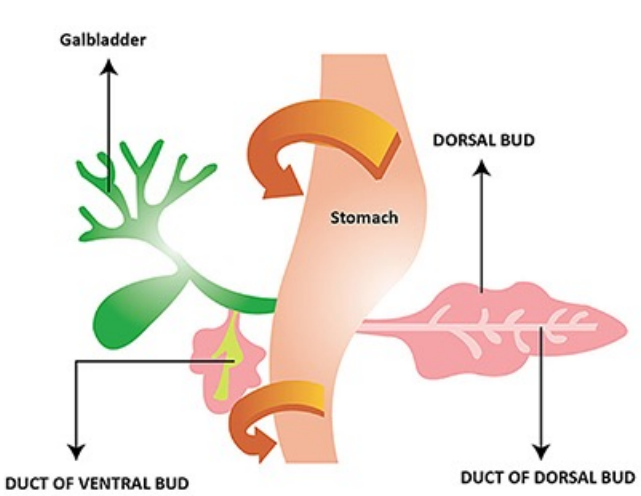
ROTATION ABNORMALITIES

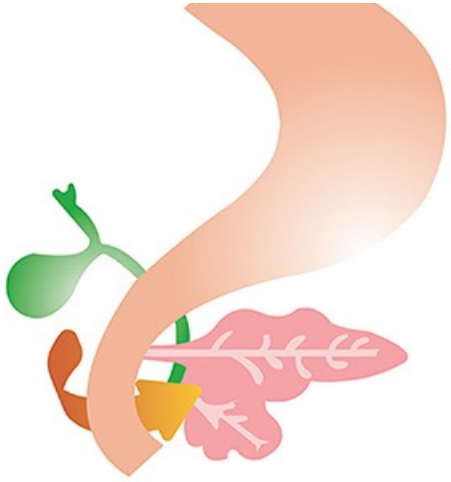


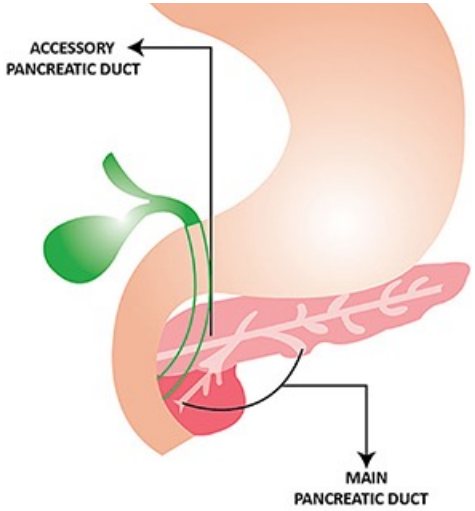


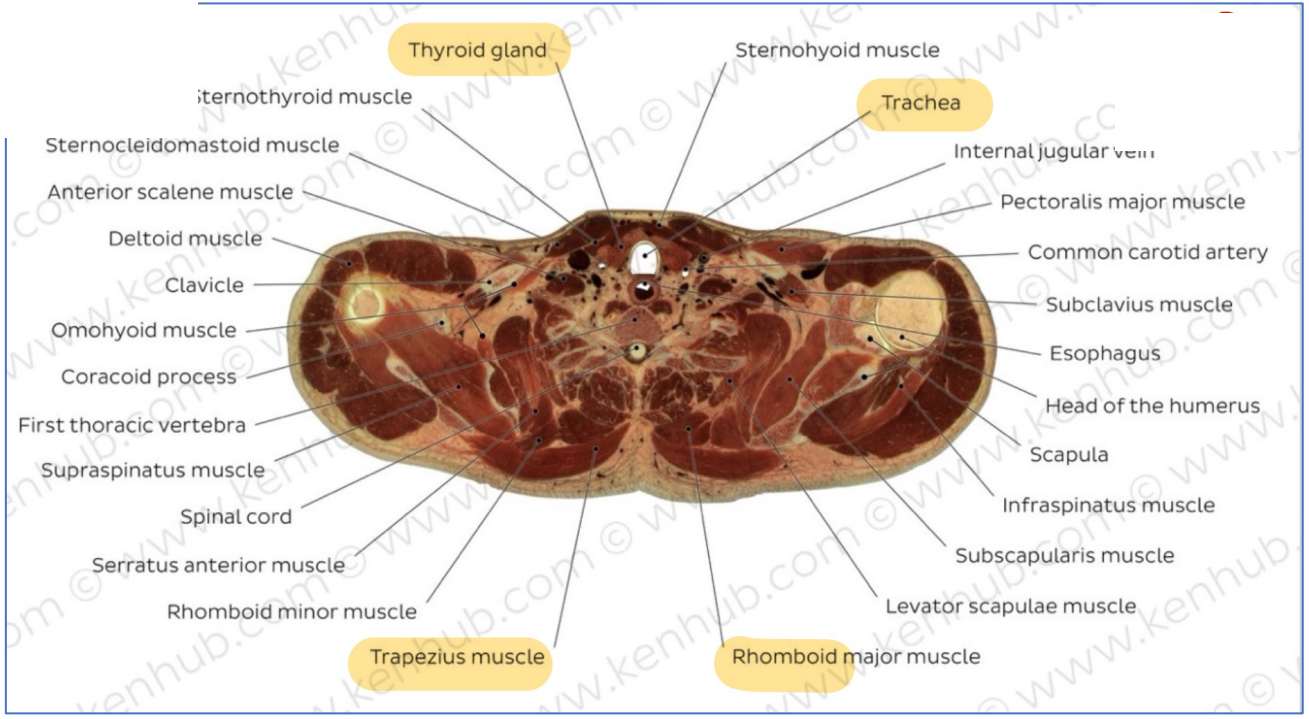


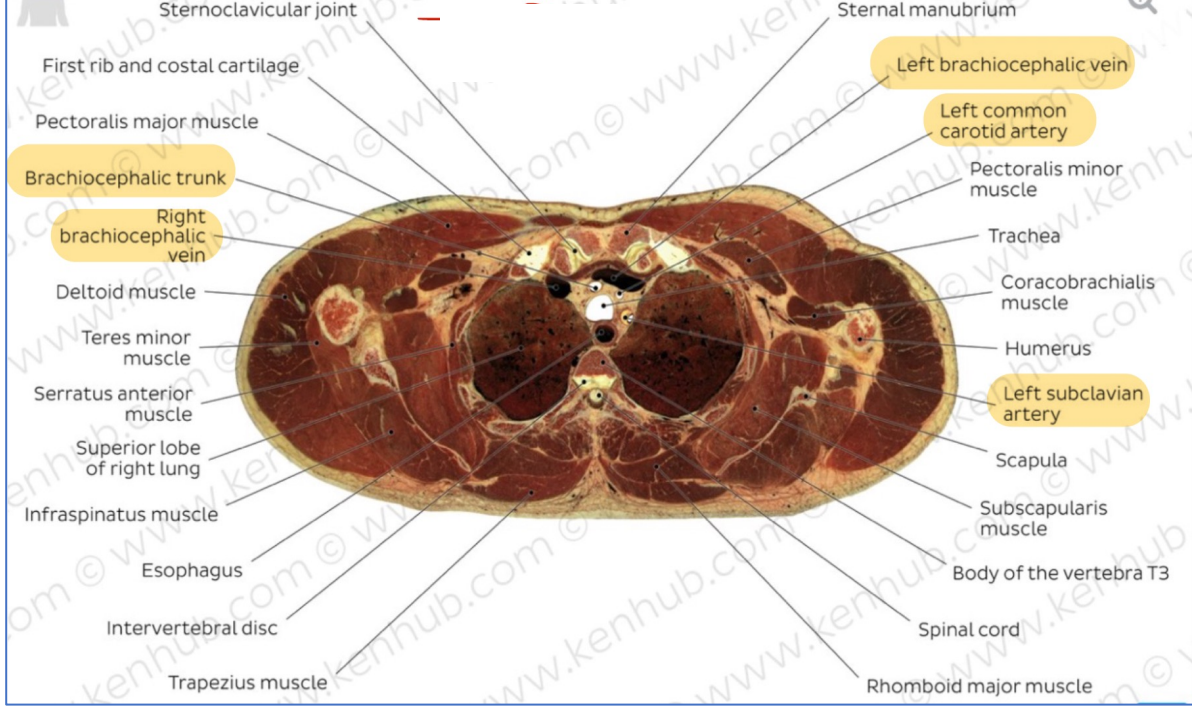
PANCREAS EMBRYOLOGY

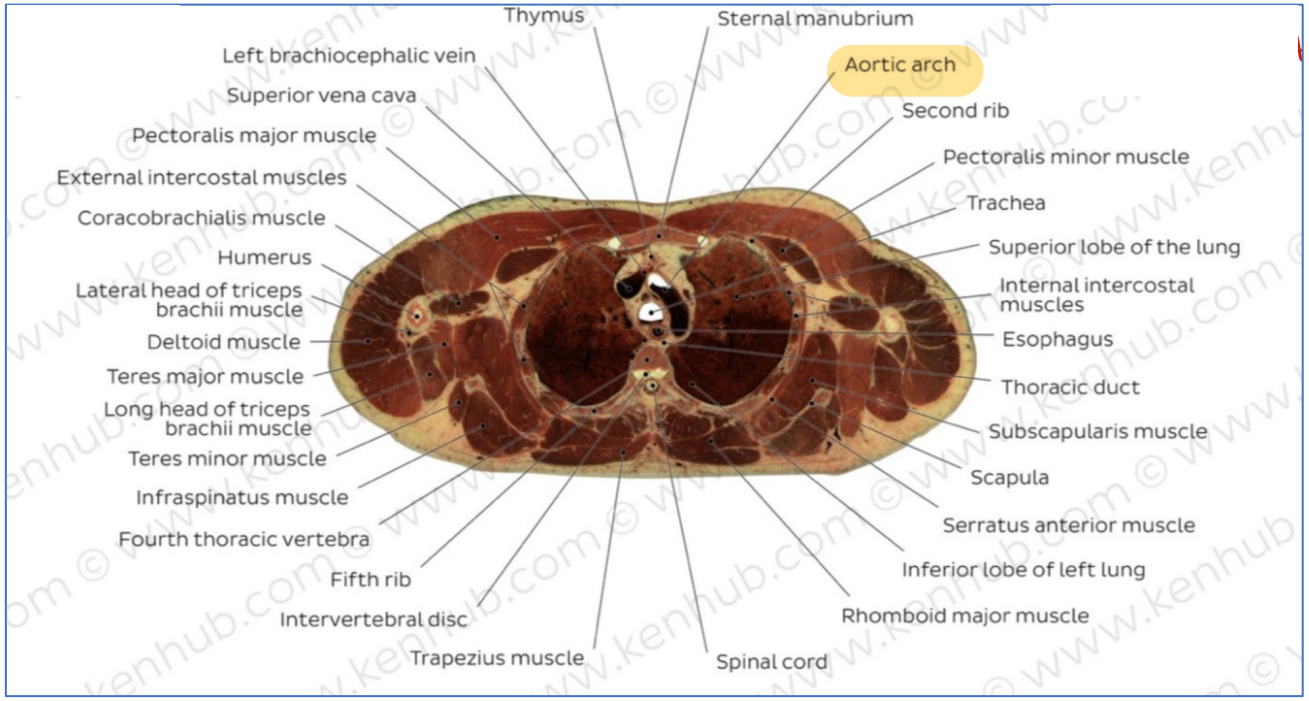


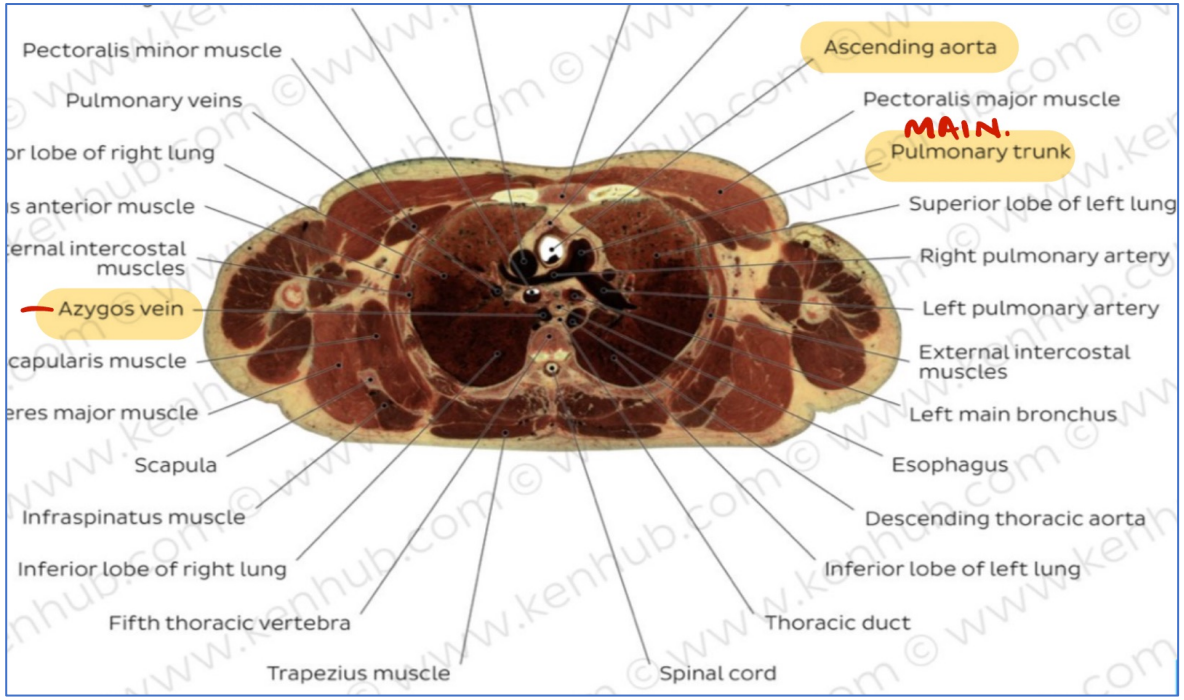


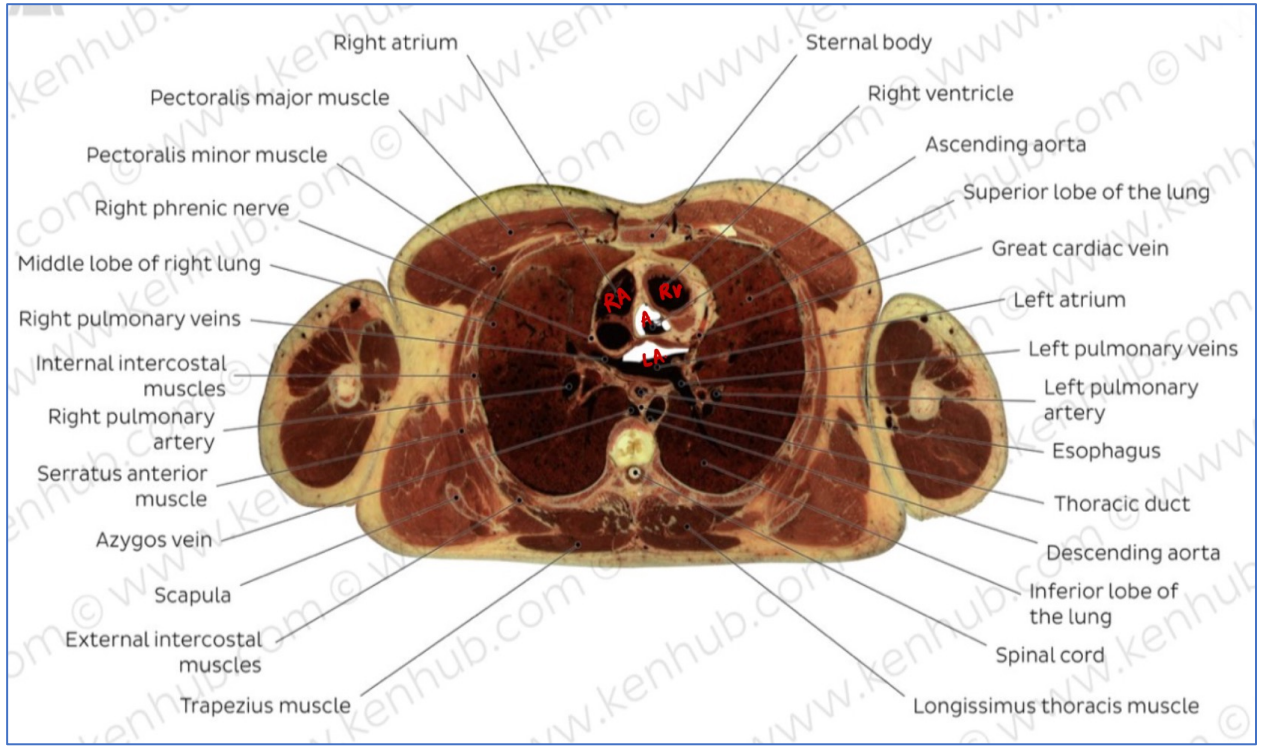


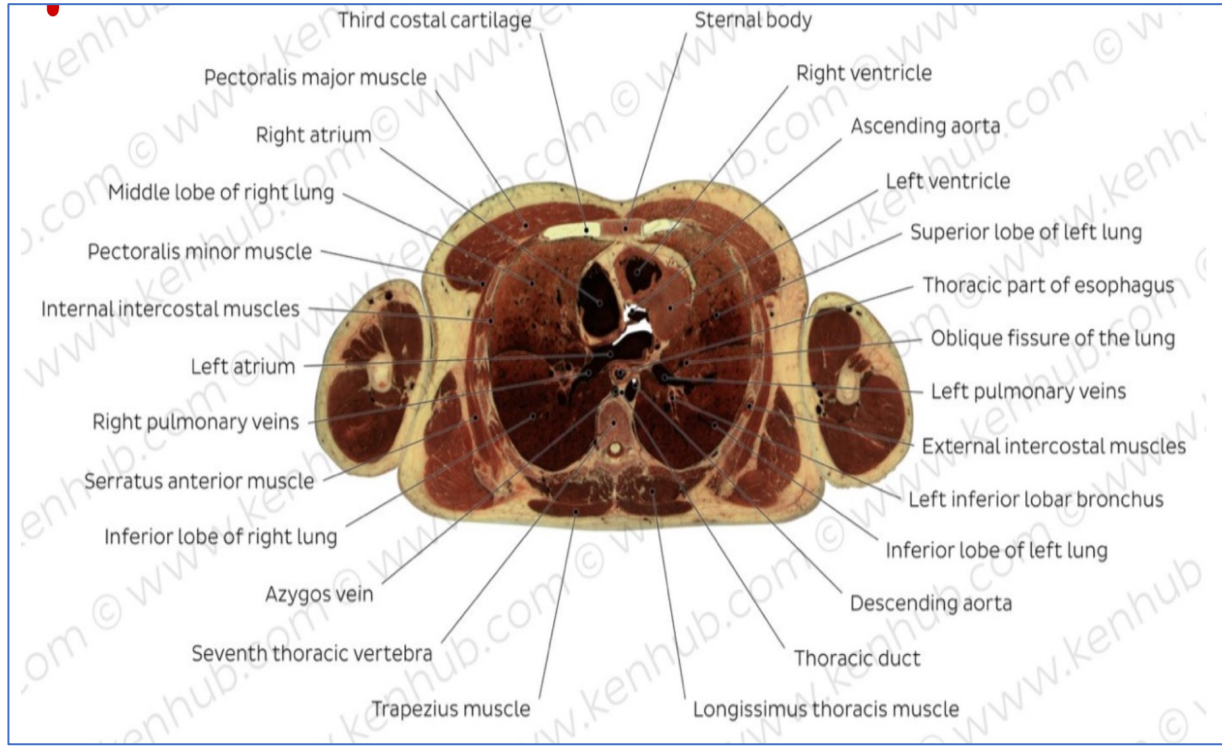

Thyroid gland
Sternohyoid muscle
Sternothyroid muscle
Trachea
Sternocleidomastoid muscle
Internal jugular vein
Anterior scalene muscle
Pectoralis major muscle
Deltoid muscle
Common carotid artery
Clavicle
Subclavius muscle
Omohyoid muscle
Esophagus
Coracoid process
Head of the humerus
First thoracic vertebra
Scapula
Supraspinatus muscle
Infraspinatus muscle
Spinal cord
Subscapularis muscle
Serratus anterior muscle
Levator scapulae muscle
Rhomboid minor muscle
Trapezius muscle
Rhomboid major muscle

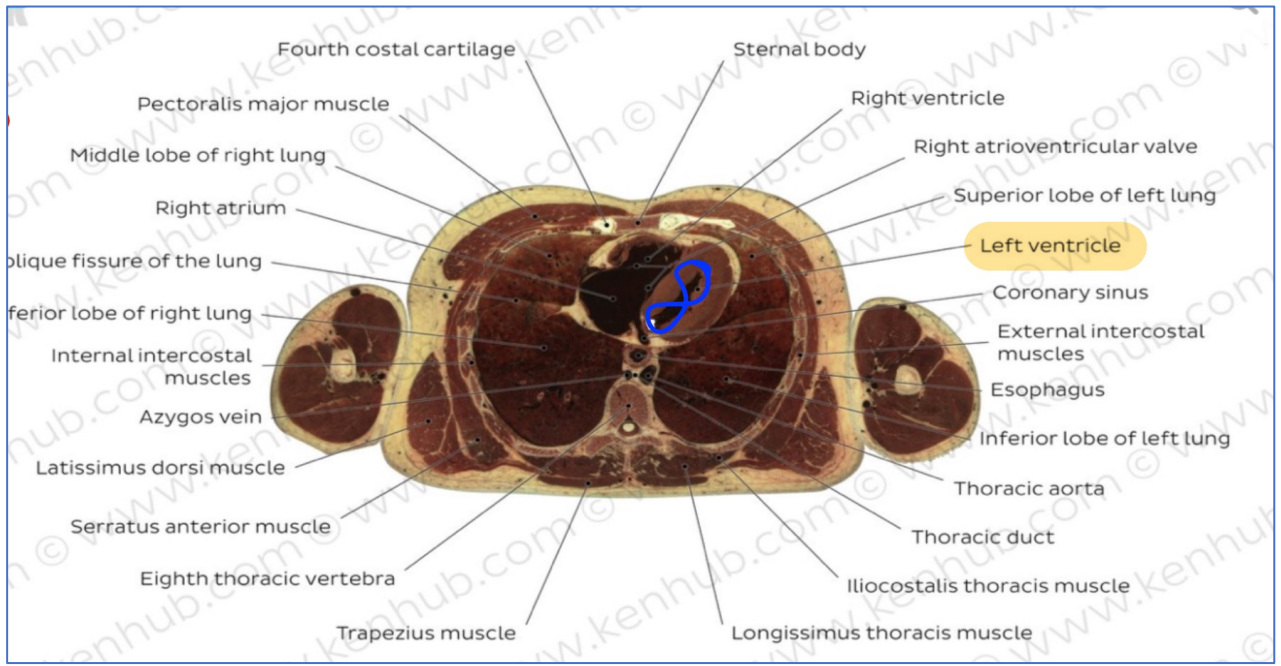

Sternoclavicular joint
Sternal manubrium
First rib and costal cartilage
Left brachiocephalic vein
Pectoralis major muscle
Left common carotid artery
Brachiocephalic trunk
Pectoralis minor muscle
Right brachiocephalic vein
Trachea
Deltoid muscle
Coracobrachialis muscle
Teres minor muscle
Humerus
Serratus anterior muscle
Left subclavian artery
Superior lobe of right lung
Scapula
Infraspinatus muscle
Subscapularis muscle
Esophagus
Body of the vertebra T3
Intervertebral disc
Spinal cord
Trapezius muscle
Rhomboid major muscle

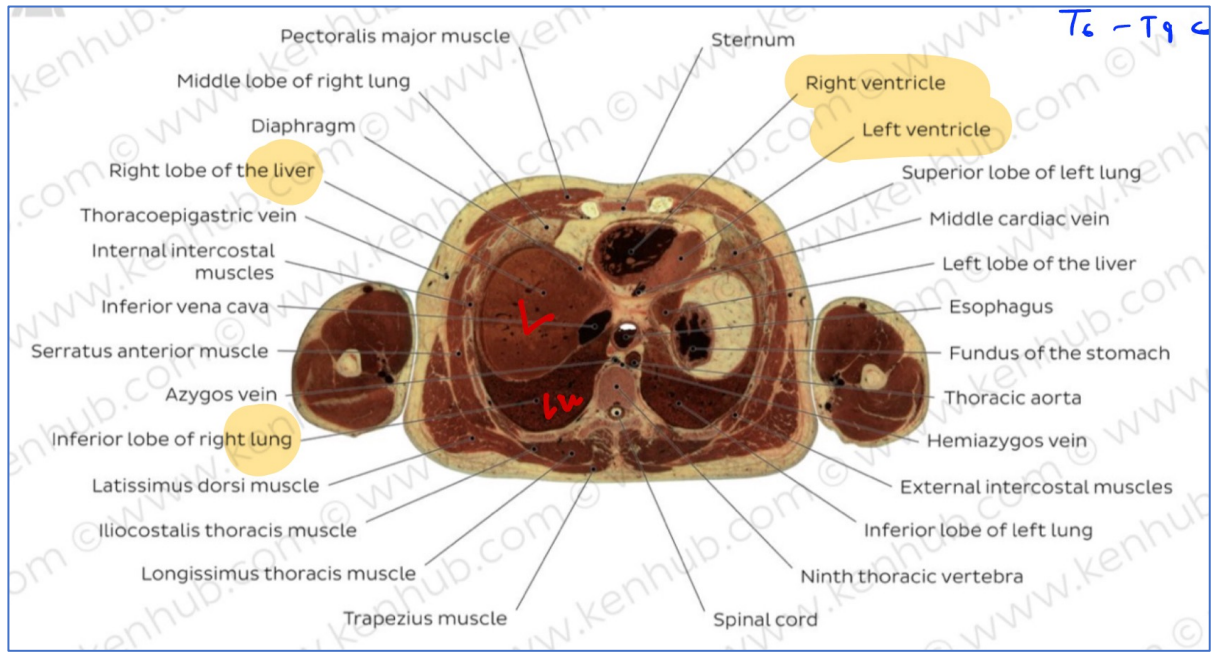

Thymus
Sternal manubrium
Left brachiocephalic vein
Aortic arch
Superior vena cava
Second rib
Pectoralis major muscle
Pectoralis minor muscle
External intercostal muscles
Trachea
Coracobrachialis muscle
Superior lobe of the lung
Humerus
Internal intercostal muscles
Lateral head of triceps brachii muscle
Deltoid muscle
Esophagus
Teres major muscle
Thoracic duct
Long head of triceps brachii muscle
Subscapularis muscle
Teres minor muscle
Scapula
Infraspinatus muscle
Serratus anterior muscle
Fourth thoracic vertebra
Inferior lobe of left lung
Fifth rib
Rhomboid major muscle
Intervertebral disc
Trapezius muscle
Spinal cord

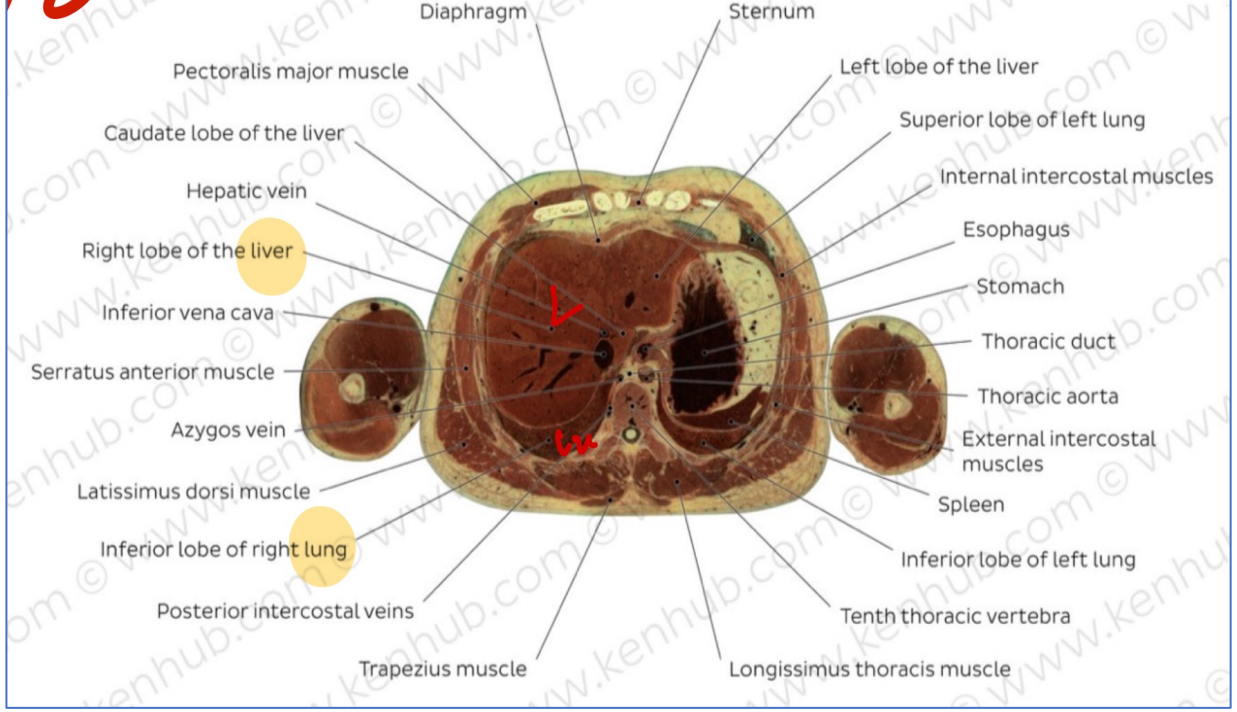

Pectoralis minor muscle
Ascending aorta
Pulmonary veins
Pectoralis major muscle
MAIN.
Pulmonary trunk
Superior lobe of left lung
Right pulmonary artery
Azygos vein
Left pulmonary artery
External intercostal muscles
Left main bronchus
Scapula
Esophagus
Infraspinatus muscle
Descending thoracic aorta
Inferior lobe of right lung
Inferior lobe of left lung
Fifth thoracic vertebra
Thoracic duct
Trapezius muscle
Spinal cord

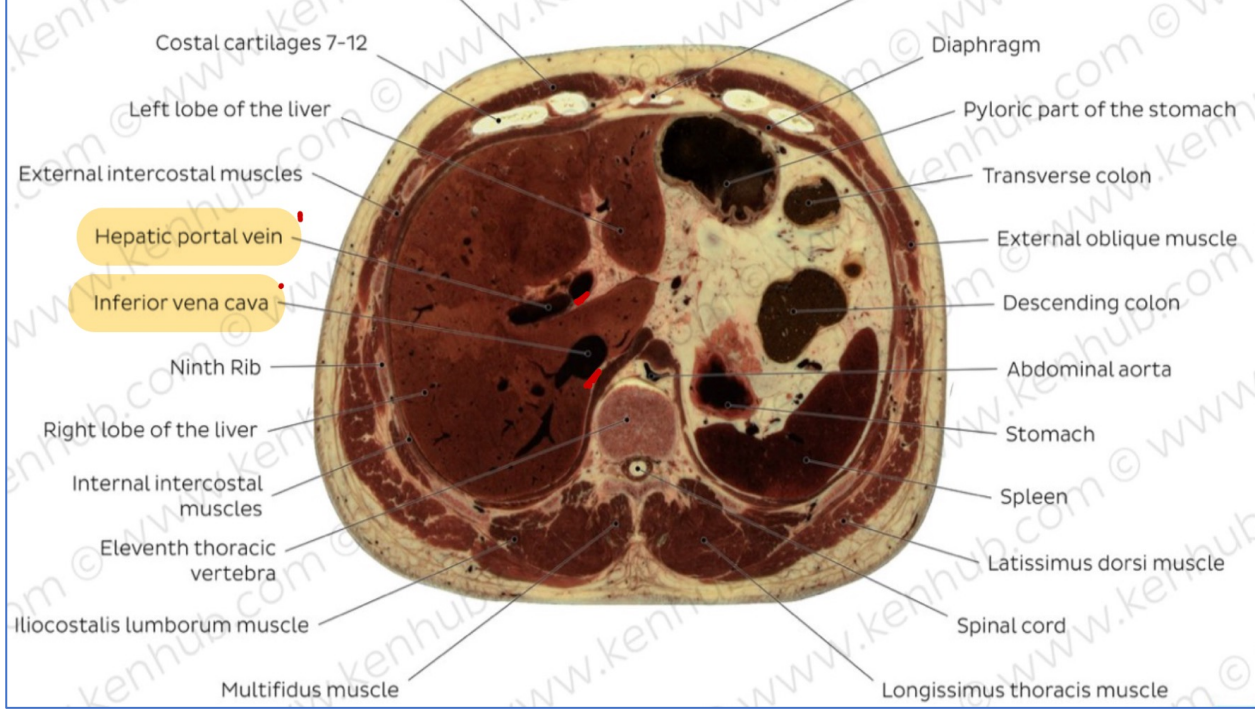

Right atrium
Sternal body
Pectoralis major muscle
Right ventricle
Pectoralis minor muscle
Ascending aorta
Right phrenic nerve
Superior lobe of the lung
Middle lobe of right lung
Great cardiac vein
Right pulmonary veins
Left atrium
Internal intercostal muscles
Left pulmonary veins
Right pulmonary artery
Left pulmonary artery
Esophagus
Serratus anterior muscle
Thoracic duct
Azygos vein
Descending aorta
Scapula
Inferior lobe of the lung
External intercostal muscles
Spinal cord
Trapezius muscle
Longissimus thoracis muscle
RA
RV
A
LA

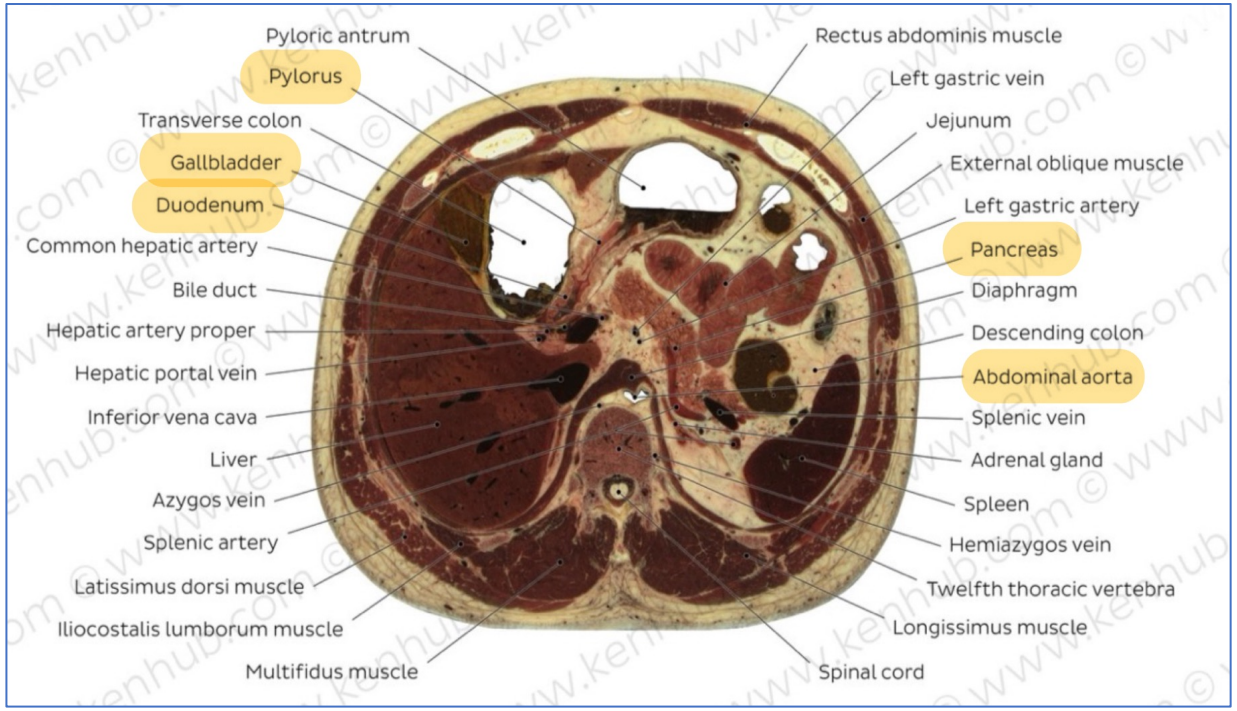

Third costal cartilage
Sternal body
Pectoralis major muscle
Right ventricle
Right atrium
Ascending aorta
Middle lobe of right lung
Left ventricle
Pectoralis minor muscle
Superior lobe of left lung
Internal intercostal muscles
Thoracic part of esophagus
Left atrium
Oblique fissure of the lung
Right pulmonary veins
Left pulmonary veins
Serratus anterior muscle
External intercostal muscles
Inferior lobe of right lung
Left inferior lobar bronchus
Azygos vein
Inferior lobe of left lung
Seventh thoracic vertebra
Descending aorta
Trapezius muscle
Thoracic duct
Longissimus thoracis muscle

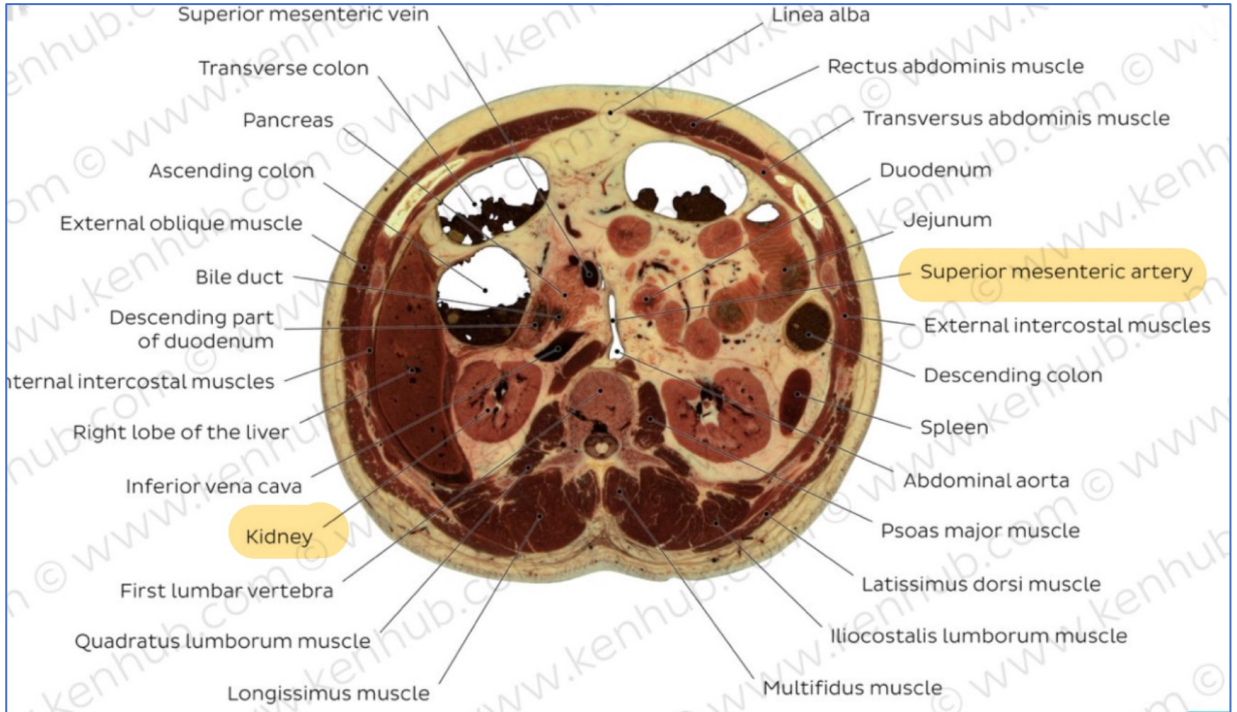

Fourth costal cartilage
Sternal body
Pectoralis major muscle
Right ventricle
Middle lobe of right lung
Right atrioventricular valve
Right atrium
Superior lobe of left lung
Oblique fissure of the lung
Left ventricle
Inferior lobe of right lung
Coronary sinus
Internal intercostal muscles
External intercostal muscles
Azygos vein
Esophagus
Latissimus dorsi muscle
Inferior lobe of left lung
Thoracic aorta
Serratus anterior muscle
Thoracic duct
Eighth thoracic vertebra
Iliocostalis thoracis muscle
Trapezius muscle
Longissimus thoracis muscle

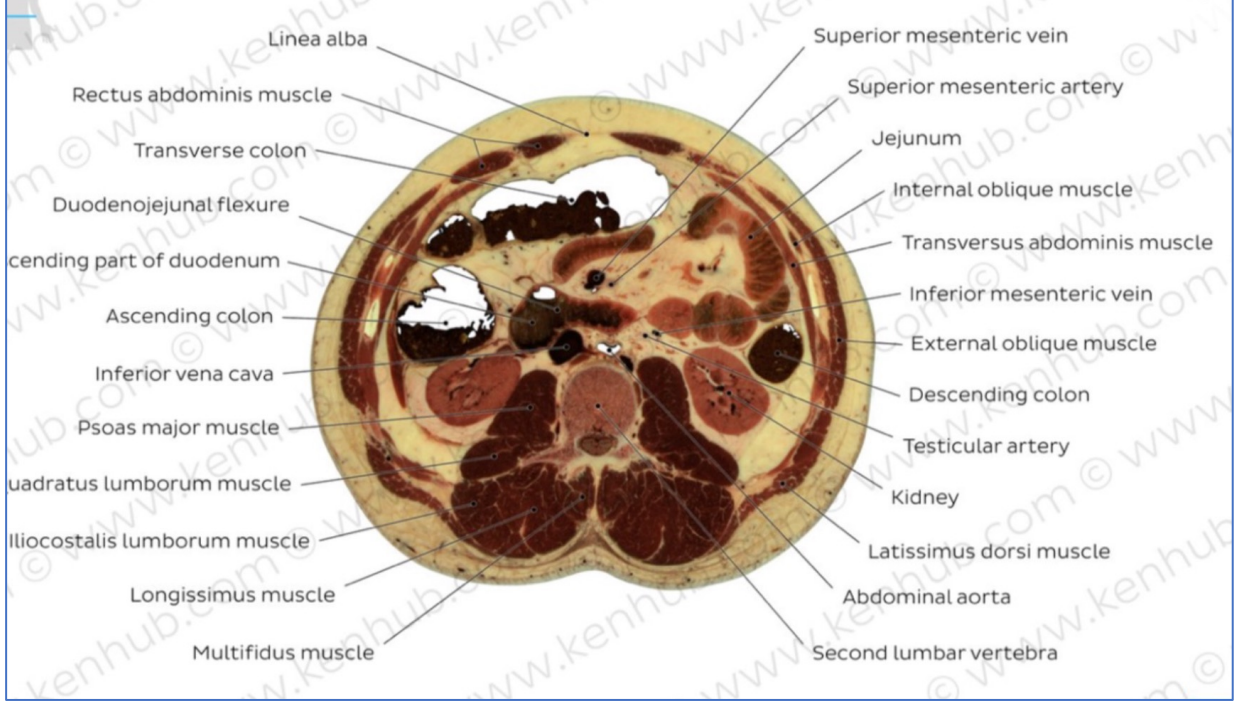

T6 - T9
Pectoralis major muscle
Sternum
Middle lobe of right lung
Right ventricle
Diaphragm
Left ventricle
Right lobe of the liver
Superior lobe of left lung
Thoracoepigastric vein
Middle cardiac vein
Internal intercostal muscles
Left lobe of the liver
Inferior vena cava
Esophagus
Serratus anterior muscle
Fundus of the stomach
Azygos vein
Thoracic aorta
Inferior lobe of right lung
Hemiazygos vein
Latissimus dorsi muscle
External intercostal muscles
Iliocostalis thoracis muscle
Inferior lobe of left lung
Longissimus thoracis muscle
Ninth thoracic vertebra
Trapezius muscle
Spinal cord
L
LV

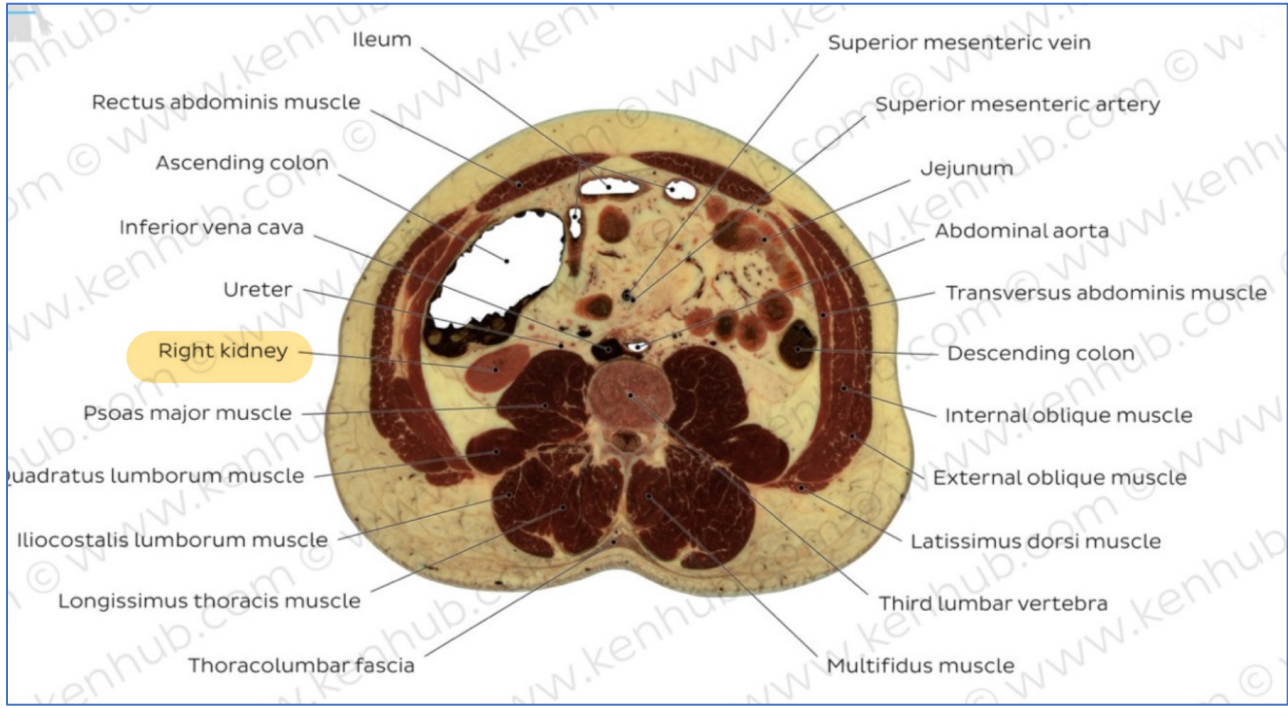

Diaphragm
Sternum
Pectoralis major muscle
Left lobe of the liver
Caudate lobe of the liver
Superior lobe of left lung
Hepatic vein
Internal intercostal muscles
Right lobe of the liver
Esophagus
Inferior vena cava
Stomach
Serratus anterior muscle
Thoracic duct
Thoracic aorta
Azygos vein
External intercostal muscles
Latissimus dorsi muscle
Spleen
Inferior lobe of right lung
Inferior lobe of left lung
Posterior intercostal veins
Tenth thoracic vertebra
Trapezius muscle
Longissimus thoracis muscle


Costal cartilages 7-12
Diaphragm
Left lobe of the liver
Pyloric part of the stomach
External intercostal muscles
Transverse colon
Hepatic portal vein
External oblique muscle
Inferior vena cava
Descending colon
Ninth Rib
Abdominal aorta
Right lobe of the liver
Stomach
Internal intercostal muscles
Spleen
Eleventh thoracic vertebra
Latissimus dorsi muscle
Iliocostalis lumborum muscle
Spinal cord
Multifidus muscle
Longissimus thoracis muscle


Pyloric antrum
Rectus abdominis muscle
Pylorus
Left gastric vein
Transverse colon
Jejunum
Gallbladder
External oblique muscle
Duodenum
Left gastric artery
Common hepatic artery
Pancreas
Bile duct
Diaphragm
Hepatic artery proper
Descending colon
Hepatic portal vein
Abdominal aorta
Inferior vena cava
Splenic vein
Liver
Adrenal gland
Azygos vein
Spleen
Splenic artery
Hemiazygos vein
Latissimus dorsi muscle
Twelfth thoracic vertebra
Iliocostalis lumborum muscle
Longissimus muscle
Multifidus muscle
Spinal cord


Superior mesenteric vein
Linea alba
Transverse colon
Rectus abdominis muscle
Pancreas
Transversus abdominis muscle
Ascending colon
Duodenum
External oblique muscle
Jejunum
Bile duct
Superior mesenteric artery
Descending part of duodenum
External intercostal muscles
Descending colon
Right lobe of the liver
Spleen
Inferior vena cava
Abdominal aorta
Kidney
Psoas major muscle
First lumbar vertebra
Latissimus dorsi muscle
Quadratus lumborum muscle
Iliocostalis lumborum muscle
Longissimus muscle
Multifidus muscle


Linea alba
Rectus abdominis muscle
Transverse colon
Duodenojejunal flexure
cending part of duodenum
Ascending colon
Inferior vena cava
Psoas major muscle
uadratus lumborum muscle
Iliocostalis lumborum muscle
Longissimus muscle
Multifidus muscle
Superior mesenteric vein
Superior mesenteric artery
Jejunum
Internal oblique muscle
Transversus abdominis muscle
Inferior mesenteric vein
External oblique muscle
Descending colon
Testicular artery
Kidney
Latissimus dorsi muscle
Abdominal aorta
Second lumbar vertebra


Ileum
Rectus abdominis muscle
Ascending colon
Inferior vena cava
Ureter
Right kidney
Psoas major muscle
uadratus lumborum muscle
Iliocostalis lumborum muscle
Longissimus thoracis muscle
Thoracolumbar fascia
Superior mesenteric vein
Superior mesenteric artery
Jejunum
Abdominal aorta
Transversus abdominis muscle
Descending colon
Internal oblique muscle
External oblique muscle
Latissimus dorsi muscle
Third lumbar vertebra
Multifidus muscle

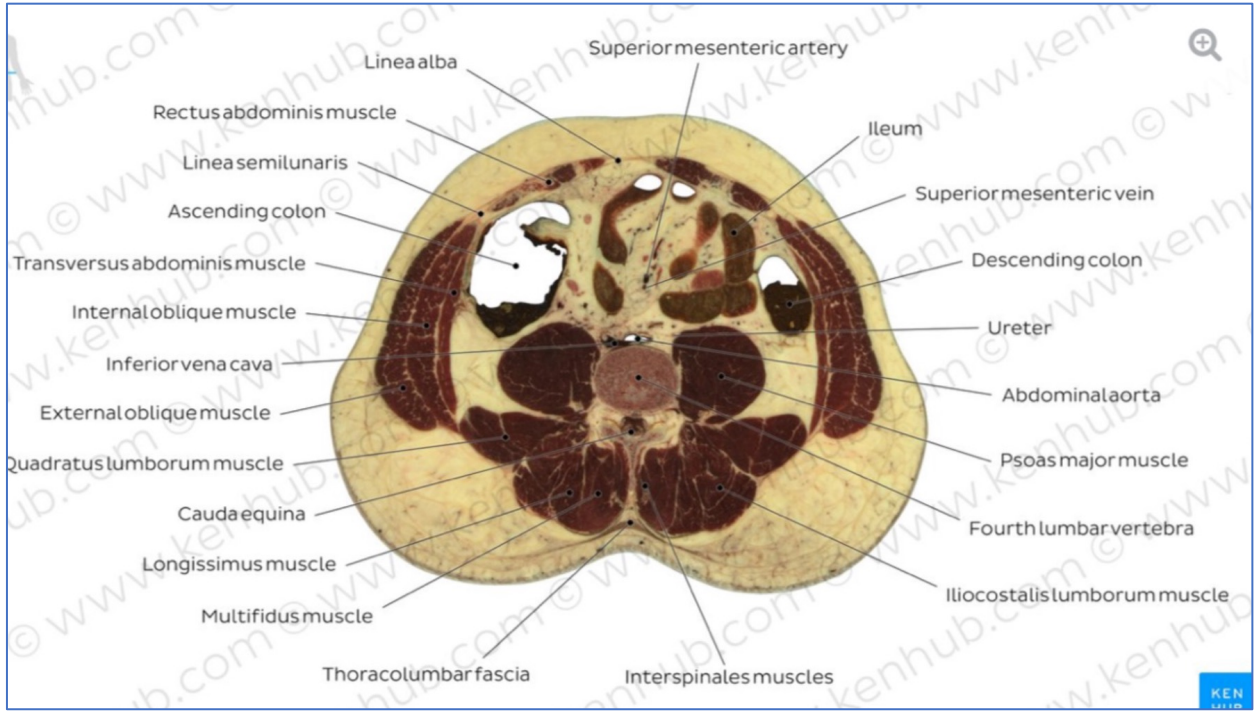

Linea alba
Rectus abdominis muscle
Linea semilunaris
Ascending colon
Transversus abdominis muscle
Internal oblique muscle
Inferior vena cava
External oblique muscle
Quadratus lumborum muscle
Cauda equina
Longissimus muscle
Multifidus muscle
Thoracolumbar fascia
Superior mesenteric artery
Ileum
Superior mesenteric vein
Descending colon
Ureter
Abdominal aorta
Psoas major muscle
Fourth lumbar vertebra
Iliocostalis lumborum muscle
Interspinales muscles

Fig. 43.40 The seventh cervical vertebra, superior aspect. Key: 1, body; 2, superior articular facet; 3, inferior articular process; 4, spinous process; 5, uncinate process; 6, foramen transversarium (foramina are asymmetrical in this specimen); 7, transverse process; 8, pedicle; 9, vertebral foramen; 10, lamina.

Fig. 43.22 The fourth thoracic vertebra, superior aspect. Key: 1, bone derived from anular epiphysis; 2, vertebral body – bone derived from centrum; 3, pedicle; 4, superior articular facet; 5, transverse process; 6, spinous process; 7, vertebral body – bone derived from neural arch; 8, vertebral foramen; 9, costal facet; 10, lamina.

Fig. 43.43 The first lumbar vertebra, superior aspect. Key: 1, body; 2, pedicle; 3, transverse process; 4, accessory process; 5, mammillary process; 6, spinous process; 7, vertebral foramen; 8, superior articular facet; 9, lamina; 10, inferior articular facet.

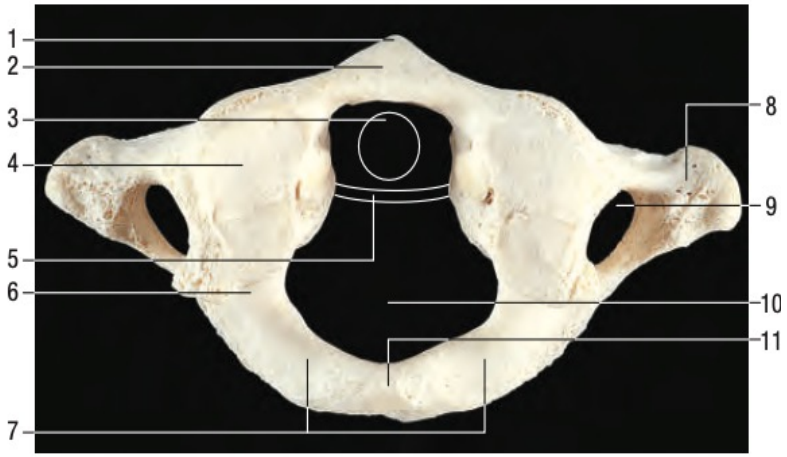


Fig. 43.32 The first cervical vertebra (atlas), superior aspect. Key: 1, anterior tubercle; 2, anterior arch; 3, outline of dens; 4, superior articular facet, on lateral mass (bipartite facet in this specimen); 5, outline of transverse ligament; 6, groove for vertebral artery and C1 (beneath bony overhang from lateral mass here); 7, posterior arch; 8, transverse process; 9, foramen transversarium; 10, vertebral foramen; 11, posterior tubercle.

Fig. 43.36 The second cervical vertebra (axis), superior aspect. Key: 1, dens – attachment of apical ligament; 2, superior articular facet on lateral mass; 3, dens – attachments of alar ligaments; 4, foramen transversarium; 5, pedicle; 6, spinous process; 7, body; 8, transverse process; 9, vertebral foramen; 10, inferior articular process; 11, lamina.

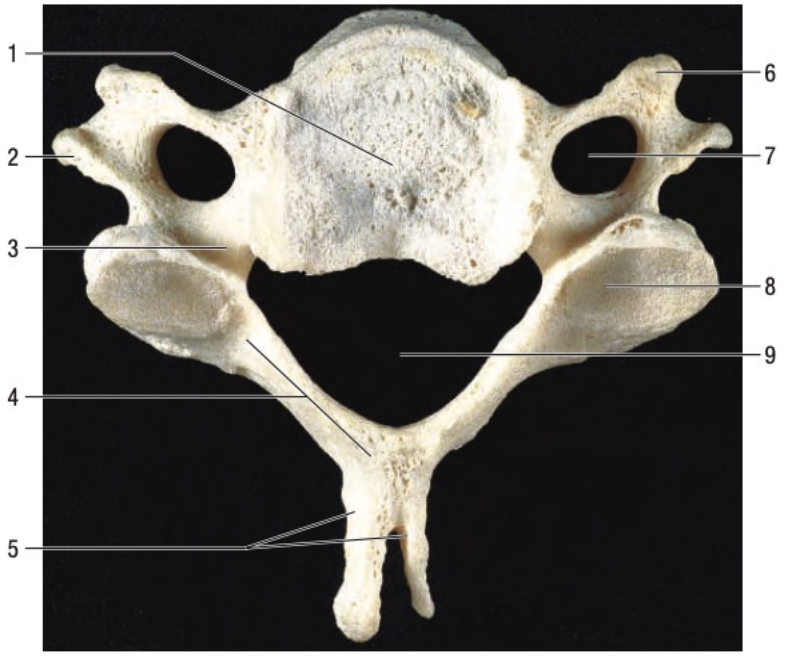


Fig. 43.29 The fourth cervical vertebra, superior aspect. Key: 1, body; 2, posterior tubercle of transverse process; 3, pedicle; 4, lamina; 5, bifid spinous process; 6, anterior tubercle of transverse process; 7, foramen transversarium; 8, superior articular facet; 9, vertebral foramen.