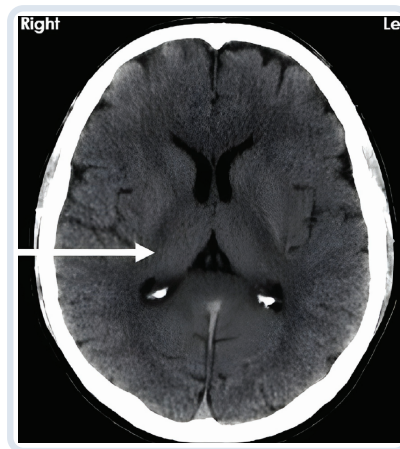


## QUESTION

Which of the following statement is correct about the marked area in the given section?



CORRECT

- A** Charcot's artery supplies its posterior limb
- B** Sub lenticular portion contains optic radiation
- C** Largest association fibres in the cerebrum
- D** Injury to the genu will cause I/L facial paralysis

## RIGHT ANSWER

- OK** **A. Charcot's artery supplies its posterior limb**

## WHY THIS IS RIGHT

The internal capsule is a major white-matter projection pathway connecting the cerebral cortex with the brainstem and spinal cord. It lies between the caudate nucleus and thalamus medially and the lentiform nucleus laterally. Parts of the internal capsule:

- Anterior limb
- Genu
- Posterior limb
- Retrolenticular part
- Sublenticular part

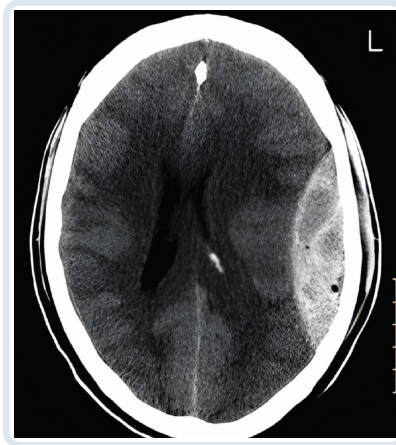
Blood supply:

- The posterior limb of the internal capsule is mainly supplied by lenticulostriate branches of the middle cerebral artery.
- One of these branches is the Charcot artery (artery of cerebral hemorrhage).

Rupture of the Charcot artery in hypertension can cause intracerebral hemorrhage involving the posterior limb of the internal capsule, leading to contralateral hemiplegia and sensory loss because corticospinal and thalamocortical fibers pass through this region.

## QUESTION

A 23-year-old woman is brought to the emergency department unconscious after a motor vehicle accident. NCCT is shown here. A branch of which of the following arteries is most likely severed in this patient?



A Facial

B Maxillary

CORRECT

C Middle cerebral

D Sphenopalatine

## RIGHT ANSWER

OK

B. Maxillary

## WHY THIS IS RIGHT

A biconvex (lens-shaped) hyperdense collection on NCCT following head trauma is characteristic of an epidural hematoma. This usually occurs due to rupture of the middle meningeal artery, most commonly after a temporal bone (pterion) fracture.

Key anatomical correlation:

- Middle meningeal artery is a branch of the maxillary artery.
- It runs between the skull and dura mater.
- Trauma can tear this artery -> rapid arterial bleeding -> epidural hematoma.

Classic clinical features:

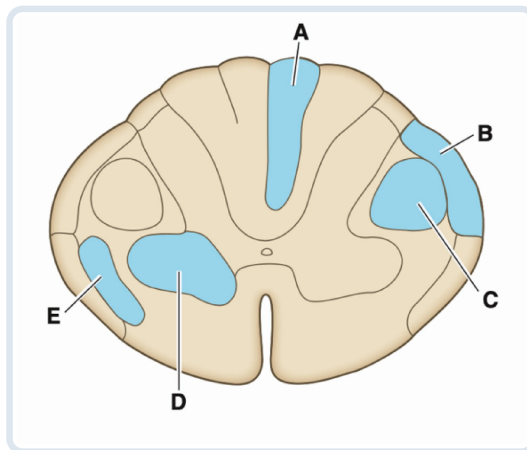
- Head trauma
- Brief loss of consciousness -> lucid interval -> rapid deterioration
- Expanding hematoma causing increased intracranial pressure and brain compression



## QUESTION

Match the descriptions in items 1 to 5 with the appropriate lettered lesion in the diagram of a cross-section of the spinal cord.

1. Ipsilateral lower limb dystaxia
2. Ipsilateral flaccid paralysis
3. Contralateral loss of pain and temperature sensation one segment below the lesion
4. Exaggerated muscle stretch reflexes below the lesion
5. Loss of two-point tactile discrimination in the ipsilateral foot



**A** 1-B, 2-D, 3-E, 4-C, 5-A

CORRECT

**B** 1-B, 2-E, 3-D, 4-C, 5-A

**C** 1-C, 2-D, 3-E, 4-A, 5-B

**D** 1-E, 2-B, 3-A, 4-C, 5-D

## RIGHT ANSWER

OK

**A. 1-B, 2-D, 3-E, 4-C, 5-A**

## WHY THIS IS RIGHT

The source quiz contains the placeholder "\$2" here and does not include a written explanation for this item.

## QUESTION

A 44-year-old woman comes to the physician because of a 1-month history of progressively worsening headaches and fatigue. She has also had a 5-kg weight loss in the same time period. MRI of the head shows a hyperintense mass with extension into the right foramen rotundum. Further evaluation of this patient is most likely to show which of the following findings?

**A** Decreased sensation over the cheekbone, nasolabial fold, and the upper lip

CORRECT

**B** Hemiatrophy of the tongue with right-sided deviation when protruded

**C** Abnormal taste of the distal tongue and decreased sensation behind the ear

**D** Absent corneal reflex and decreased sensation of the forehead

## RIGHT ANSWER

**OK** **A. Decreased sensation over the cheekbone, nasolabial fold, and the upper lip**

## WHY THIS IS RIGHT

The foramen rotundum transmits the maxillary nerve (V2), the purely sensory division of the trigeminal nerve. A lesion extending into the foramen rotundum therefore affects V2 sensory distribution.

Sensory supply of V2 (maxillary nerve):

- Lower eyelid
- Cheek (zygomatic region)
- Side of the nose and nasolabial fold
- Upper lip
- Upper teeth and maxillary sinus

Compression of V2 leads to loss or decrease of sensation in the midface. Therefore, a tumor involving the foramen rotundum will most likely cause decreased sensation over the cheekbone, nasolabial fold, and upper lip.

## QUESTION

| All of the following are true about grey rami communicants except:

- A** Unmyelinated
- B** Connected to spinal nerve
- C** Preganglionic
- D** Present medial to white rami communicants

CORRECT

## RIGHT ANSWER

OK

**C. Preganglionic**

## WHY THIS IS RIGHT

Gray rami communicants are branches that connect the sympathetic trunk (paravertebral ganglia) to the spinal nerves and carry postganglionic sympathetic fibers to the body wall.

- Unmyelinated fibers
- Contain postganglionic sympathetic fibers
- Connect the sympathetic chain ganglion to the spinal nerve
- Present at all spinal levels (C1-Co)
- Located medial to the white rami communicants

| Feature        | White rami                       | Gray rami                        |
|----------------|----------------------------------|----------------------------------|
| Fiber type     | Myelinated                       | Unmyelinated                     |
| Fibers carried | Preganglionic sympathetic        | Postganglionic sympathetic       |
| Levels present | T1–L2 only                       | All spinal levels                |
| Direction      | Spinal nerve → sympathetic trunk | Sympathetic trunk → spinal nerve |

## QUESTION

| Which of the following is not true about the location of otic ganglia?

- A Roof- Foramen ovale
- B Medial- Tensor veli palatini
- C Medial- Mandibular nerve**
- D Posterior- Middle meningeal artery

CORRECT

## RIGHT ANSWER

- OK
- C. Medial- Mandibular nerve**

## WHY THIS IS RIGHT

The otic ganglion is a small parasympathetic ganglion in the infratemporal fossa, located just below the foramen ovale and medial to the mandibular nerve (V3).

Relations of the otic ganglion:

- Superior (roof): Foramen ovale
- Lateral: Mandibular nerve (V3)
- Medial: Tensor veli palatini muscle
- Posterior: Middle meningeal artery

Parasympathetic pathway:

Preganglionic fibers from the glossopharyngeal nerve (via the lesser petrosal nerve) synapse in the otic ganglion.

Postganglionic fibers travel through the auriculotemporal nerve to supply the parotid gland.

## QUESTION

**Sequential arrangement of secretomotor pathway to lacrimal gland:**

1. Pons
2. Nerve of pterygoid canal
3. Geniculate ganglion
4. Nervus intermedius
5. Lacrimal nerve
6. Greater petrosal nerve
7. Pterygopalatine ganglion
8. Zygomaticotemporal nerve

**A** 1, 4, 3, 2, 6, 7, 8, 5

**B** 1, 4, 3, 6, 2, 7, 8, 5

CORRECT

**C** 1, 3, 2, 7, 4, 6, 8, 5

**D** 1, 3, 7, 4, 2, 6, 8, 5

## RIGHT ANSWER

**OK** **B. 1, 4, 3, 6, 2, 7, 8, 5**

## WHY THIS IS RIGHT

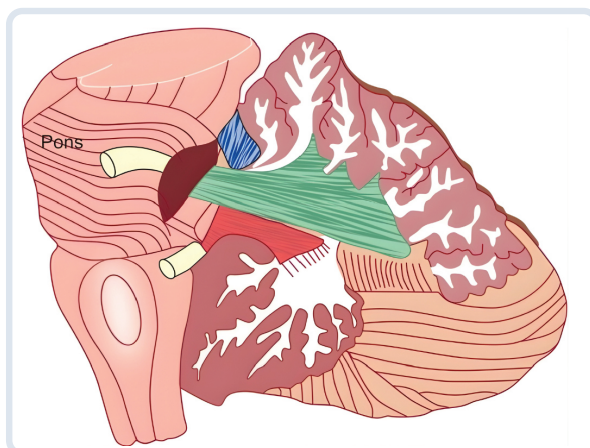
The secretomotor (parasympathetic) supply of the lacrimal gland originates from the facial nerve (CN VII) and follows a specific sequence through the pterygopalatine ganglion before reaching the gland.

## Sequential pathway

1. Pons - Preganglionic parasympathetic fibers arise from the superior salivatory nucleus.
2. Nervus intermedius - Parasympathetic root of the facial nerve carries these fibers.
3. Geniculate ganglion - Sensory ganglion; fibers pass through without synapse.
4. Greater petrosal nerve - Carries preganglionic parasympathetic fibers.
5. Nerve of pterygoid canal (Vidian nerve) - Formed by the union of greater petrosal nerve + deep petrosal nerve.
6. Pterygopalatine ganglion - Synapse occurs here.
7. Zygomaticotemporal nerve (branch of V2) - Postganglionic fibers hitchhike.
8. Lacrimal nerve (branch of V1) - Carries fibers to the lacrimal gland.

## QUESTION

**Fibers from the structure marked in blue, terminate at which of the following?**



**A** Fastigial nucleus

**B** Inferior olivary nucleus

**C** Red nucleus

CORRECT

**D** Subthalamus

## RIGHT ANSWER

OK

**C. Red nucleus**

## WHY THIS IS RIGHT

The blue structure represents the superior cerebellar peduncle, the main efferent pathway of the cerebellum.

- Fibers arise mainly from the dentate nucleus of the cerebellum.
- They exit the cerebellum through the superior cerebellar peduncle.
- The fibers decussate in the midbrain (decussation of superior cerebellar peduncle).
- They terminate in the red nucleus and also relay to the ventrolateral nucleus of the thalamus, which then projects to the motor cortex.

Function:

- Coordinates voluntary movement
- Regulates motor planning and fine motor control

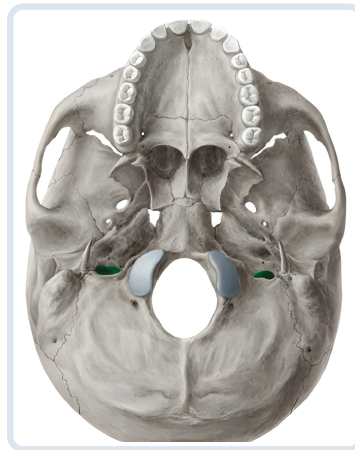
Lesions of the superior cerebellar peduncle or dentate nucleus may cause:

- Intention tremor
- Dysmetria
- Ataxia

## QUESTION

Which of the following structures pass through the marked foramen?

1. Inferior petrosal sinus
2. Spinal accessory nerve
3. Vagus nerve
4. Hypoglossal nerve
5. Middle meningeal branch of the occipital artery
6. Deep petrosal nerve



A 1, 2, 3, 4, 5, 6

B 2, 4, 6

C 1, 2, 3, 5

CORRECT

D 1, 3, 6

## RIGHT ANSWER

OK

C. 1, 2, 3, 5

## WHY THIS IS RIGHT

The marked foramen is the jugular foramen, located between the temporal bone and occipital bone at the base of the skull.

Structures passing through the jugular foramen:

- Inferior petrosal sinus
- Glossopharyngeal nerve (CN IX)
- Vagus nerve (CN X)
- Spinal accessory nerve (CN XI)
- Sigmoid sinus continuing as the internal jugular vein
- Meningeal branch of the occipital artery

Structures NOT passing through:

- Hypoglossal nerve (CN XII) -> passes through the hypoglossal canal
- Deep petrosal nerve -> travels via the foramen lacerum/pterygoid canal

## QUESTION

A 58-year-old man comes to the physician for evaluation of increasing swelling in his left cheek and recurrent oral ulcers for 1 year. He has smoked a pack of cigarettes daily for 25 years. Examination shows firm, nontender swelling above the angle of jaw. USG guided biopsy shows adenoid cystic carcinoma. A left sided total parotidectomy is performed. This patient is at greatest risk for which of the following complications?

- A Hyperesthesia of the left ear lobe
- B Impaired taste of the posterior 1/3 of the tongue
- C Flushing of the right cheek while eating
- D Inability to wrinkle the left side of the forehead**

CORRECT

## RIGHT ANSWER

- OK **D. Inability to wrinkle the left side of the forehead**

## WHY THIS IS RIGHT

The facial nerve (CN VII) passes through the parotid gland and divides within it into its terminal branches (temporal, zygomatic, buccal, marginal mandibular, cervical). During a total parotidectomy, the facial nerve is at high risk of injury. Consequences of facial nerve injury:

- Paralysis of muscles of facial expression
- Loss of forehead wrinkling
- Inability to close the eye
- Facial asymmetry

The temporal branch of the facial nerve supplies the frontalis muscle, which is responsible for wrinkling the forehead. Therefore, injury during parotidectomy can cause Inability to wrinkle the left side of the forehead

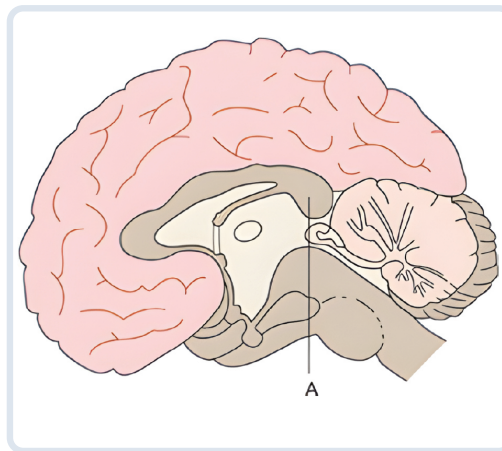
Why other options are incorrect:

- Hyperesthesia of ear lobe: related to great auricular nerve, usually causes numbness rather than hyperesthesia.
- Loss of taste posterior 1/3 tongue: glossopharyngeal nerve (CN IX).
- Flushing while eating: Frey syndrome, occurs later due to auriculotemporal nerve misdirection and would be ipsilateral, not contralateral.



## QUESTION

Which of the following is connected to the structure marked as A in the image below?



A Orbital cortex

B Hippocampus

C Primary visual cortex

CORRECT

D Optic chiasma

## RIGHT ANSWER

OK

C. Primary visual cortex

## WHY THIS IS RIGHT

The structure marked A represents the lateral geniculate body (lateral geniculate nucleus, LGN) of the thalamus, which is the relay nucleus for the visual pathway.

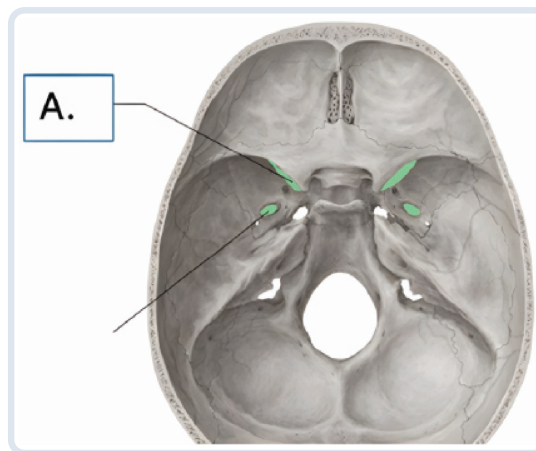
Visual pathway sequence:

1. Retina
2. Optic nerve
3. Optic chiasma
4. Optic tract
5. Lateral geniculate nucleus (LGN) of thalamus
6. Optic radiation (geniculocalcarine tract)
7. Primary visual cortex (area 17) in the occipital lobe

Neurons from the lateral geniculate nucleus project via optic radiations to the primary visual cortex (striate cortex) located along the calcarine sulcus of the occipital lobe.

## QUESTION

Sensation of which of the following structures are affected if a tumor or lesion compresses the structures passing through this opening of the skull marked A?



A Sensation of nasopharynx

B Mucosa of nasal cavity

C Sensation in anterior scalp and dorsum of nose

CORRECT

D Sensation of chin

## RIGHT ANSWER

OK

C. Sensation in anterior scalp and dorsum of nose

## WHY THIS IS RIGHT

The opening marked A is the superior orbital fissure, located between the greater and lesser wings of the sphenoid. Structures passing through the superior orbital fissure:

- Oculomotor nerve (CN III)
- Trochlear nerve (CN IV)
- Abducens nerve (CN VI)
- Ophthalmic division of trigeminal nerve (V1)
  - o Lacrimal nerve
  - o Frontal nerve
  - o Nasociliary nerve
- Superior ophthalmic vein

Sensory distribution affected: The ophthalmic nerve (V1) supplies sensation to:

- Anterior scalp and forehead
- Upper eyelid
- Dorsum of the nose

Thus, compression at the superior orbital fissure causes loss of sensation in the anterior scalp and dorsum of the nose.

## QUESTION

**In which layer of the cerebral cortex is the outer band of Baillarger seen?**

**A** External pyramidal layer

**B** Internal granular layer

CORRECT

**C** Internal pyramidal layer

**D** External granular layer

## RIGHT ANSWER

**OK** **B. Internal granular layer**

## WHY THIS IS RIGHT

The bands of Baillarger are horizontal layers of myelinated fibers seen in the cerebral cortex.

There are two bands:

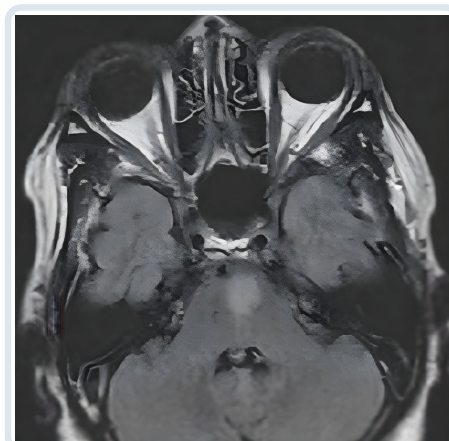
- Outer band of Baillarger -> located in Layer IV (Internal granular layer)
- Inner band of Baillarger -> located in Layer V (Internal pyramidal layer)

Functional significance:

- The outer band corresponds to thalamocortical input fibers, which terminate mainly in layer IV.
- In the primary visual cortex (area 17), the outer band is highly developed and appears as the stria of Gennari.

## QUESTION

A 65-year-old man comes to the emergency department due to acute-onset slurred speech. He also has right-sided weakness but denies any trauma, headache, or loss of consciousness. Motor strength is 3/5 on the right and 5/5 on the left with a Babinski response on the right. MRI of the brain reveals an acute lacunar infarct in the brainstem, as shown in the image below. Which of the following cranial nerves exits the brainstem closest to the level affected by this patient's stroke?



- A Facial
- B Hypoglossal
- C Oculomotor

D Trigeminal

CORRECT

RIGHT ANSWER

OK D. Trigeminal

## WHY THIS IS RIGHT

The MRI shows a lacunar infarct in the pons (brainstem). Identifying the cranial nerve that exits closest to the affected level helps localize the lesion.

Cranial nerve exit levels from the brainstem:

- Midbrain:
  - o CN III - Oculomotor
- Pons:
  - o CN V - Trigeminal
- Pontomedullary junction:
  - o CN VI - Abducens
  - o CN VII - Facial
  - o CN VIII - Vestibulocochlear
- Medulla:
  - o CN IX - Glossopharyngeal
  - o CN X - Vagus
  - o CN XI - Accessory
  - o CN XII - Hypoglossal

Since, the lesion is in the pons, the cranial nerve that exits closest to this level is Trigeminal nerve (CN V)

## QUESTION

A 27-year-old man comes to the physician because of a 1-day history of right-sided facial weakness and sound intolerance. Three days ago, he hit the right side of his head in a motor vehicle collision. He neither lost consciousness nor sought medical attention. Sensation over the face is not impaired. Impedance audiometry shows an absence of the acoustic reflex in the right ear. Which of the following muscles is most likely paralyzed in this patient?

A Tensor tympani

B Posterior cricoarytenoid

C Stylopharyngeus

D Stylohyoid

CORRECT

RIGHT ANSWER

OK

D. Stylohyoid

## WHY THIS IS RIGHT

This patient has right-sided facial weakness with hyperacusis (sound intolerance) after head trauma, indicating facial nerve (CN VII) injury. Facial nerve functions:

- Motor supply to muscles of facial expression
- Innervates stapedius muscle in the middle ear
- Supplies stylohyoid and posterior belly of digastric

Explanation of symptoms:

- Hyperacusis occurs because the stapedius muscle (innervated by CN VII) normally dampens excessive vibration of the stapes.
- Paralysis of stapedius -> increased sound sensitivity.
- Loss of acoustic reflex on impedance audiometry confirms facial nerve involvement.

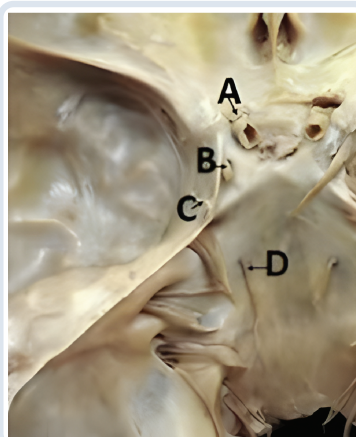
Among the options, the muscle supplied by CN VII is Stylohyoid.

Other options:

- Tensor tympani: trigeminal nerve (V3)
- Posterior cricoarytenoid: recurrent laryngeal nerve (CN X)
- Stylopharyngeus: glossopharyngeal nerve (CN IX)

## QUESTION

Which of the following does not play a role in movement of the eyeball?



CORRECT

A D

B C

C A

D B

RIGHT ANSWER

OK A. D

## WHY THIS IS RIGHT

The labeled structures are foramina at the orbital apex that transmit nerves to the orbit. Most of these nerves supply the extraocular muscles responsible for movement of the eyeball.

These pass through the superior orbital fissure and supply extraocular muscles:

- Oculomotor nerve (CN III) -> superior rectus, inferior rectus, medial rectus, inferior oblique
- Trochlear nerve (CN IV) -> superior oblique
- Abducens nerve (CN VI) -> lateral rectus

These nerves directly control eyeball movement.

Structure not involved in eyeball movement:

The structure labeled D corresponds to the optic canal transmitting the optic nerve (CN II).

- Optic nerve (CN II) is purely sensory
- Responsible for vision, not eye movement

## QUESTION

**I GSE fibres are present in cranial nerves:**

- A** I, II, III
- B** II, III, IV
- C** III, IV, VI, VII
- D** III, IV, VI, XII

CORRECT

## RIGHT ANSWER

- OK** D. III, IV, VI, XII

## WHY THIS IS RIGHT

General Somatic Efferent (GSE) fibers are motor fibers that supply the skeletal muscles derived from somites. These fibers are involved in voluntary motor control. The cranial nerves that contain GSE fibers and their respective muscles include:

- Cranial Nerve III (Oculomotor nerve): Innervates most of the extraocular muscles, including the superior rectus, inferior rectus, medial rectus, and inferior oblique, as well as the levator palpebrae superioris.
- Cranial Nerve IV (Trochlear nerve): Supplies the superior oblique muscle of the eye.
- Cranial Nerve VI (Abducens nerve): Innervates the lateral rectus muscle of the eye.
- Cranial Nerve XII (Hypoglossal nerve): Supplies the intrinsic and extrinsic muscles of the tongue.

These cranial nerves have motor nuclei that are classified as GSE.

## QUESTION

A postpartum woman presents with headache, papilledema, and increased intracranial pressure. MR venography shows superior sagittal sinus thrombosis. Which finding best explains her symptoms?

- A** Reduced CSF production
- B** Impaired CSF absorption due to blocked arachnoid villi
- C** Increased CSF drainage to spinal veins
- D** CSF leakage into subgaleal space

CORRECT

## RIGHT ANSWER

- OK** **B. Impaired CSF absorption due to blocked arachnoid villi**

## WHY THIS IS RIGHT

The superior sagittal sinus receives cerebrospinal fluid (CSF) through arachnoid villi (arachnoid granulations).

- CSF produced by the choroid plexus circulates through the ventricles and subarachnoid space.
- It is absorbed into the venous system via arachnoid villi projecting into the superior sagittal sinus.

In superior sagittal sinus thrombosis:

- Venous outflow is obstructed.
- Arachnoid villi cannot drain CSF into the sinus.
- This causes impaired CSF absorption, leading to increased intracranial pressure (ICP).

Clinical features:

- Headache
- Papilledema
- Signs of raised intracranial pressure



## QUESTION

| A right trochlear nerve lesion causes:

A Right SO palsy

CORRECT

B Left SO palsy

C Left SR palsy

D Bilateral SO palsy

## RIGHT ANSWER

OK A. Right SO palsy

## WHY THIS IS RIGHT

The trochlear nerve (CN IV) supplies the superior oblique (SO) muscle of the eye.

- It is the only cranial nerve that exits dorsally from the brainstem.
- Its fibers decussate (cross) within the brainstem before exiting.
- Therefore, each trochlear nerve innervates the superior oblique muscle on the same side after crossing.

A right trochlear nerve lesion results in right superior oblique muscle palsy.

Function of superior oblique:

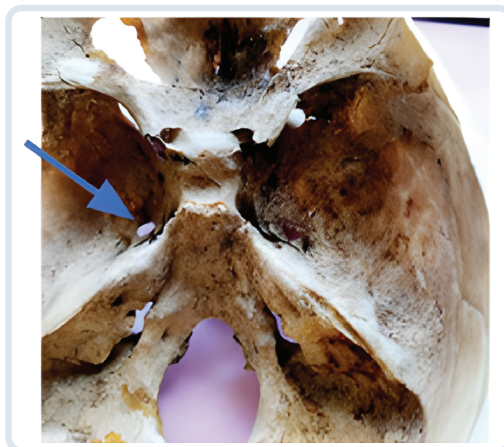
- Intorsion
- Depression of the adducted eye
- Abduction

Clinical signs:

- Vertical diplopia
- Difficulty looking down while reading or descending stairs
- Compensatory head tilt away from the affected side

## QUESTION

| Which of the following structures passes through the pointed Foramen?



A Greater Petrosal Nerve

B Deep Petrosal Nerve

C Lesser Petrosal Nerve

CORRECT

D Jacobson's Nerve

## RIGHT ANSWER

OK C. Lesser Petrosal Nerve

## WHY THIS IS RIGHT

The pointed opening is the foramen ovale in the greater wing of the sphenoid at the base of the skull.

Structures passing through the foramen ovale:

- Mandibular nerve (V3)
- Accessory meningeal artery
- Emissary vein connecting cavernous sinus with pterygoid venous plexus
- Lesser petrosal nerve (preganglionic parasympathetic fibers to otic ganglion)

Pathway of the lesser petrosal nerve:

- Originates from glossopharyngeal nerve (CN IX) via tympanic nerve (Jacobson's nerve)
- Carries preganglionic parasympathetic fibers
- Passes through foramen ovale
- Synapses in the otic ganglion
- Postganglionic fibers reach the parotid gland via the auriculotemporal nerve

Important distinction:

- Greater petrosal nerve passes through the foramen lacerum/pterygoid canal, not the foramen ovale.
- Deep petrosal nerve joins the greater petrosal nerve to form the nerve of the pterygoid canal.

## QUESTION

Which among the following statements is true regarding the course of the mandibular nerve?

1. Auriculotemporal nerve is a branch from the anterior division of the mandibular nerve, and it emerges from behind the temporomandibular joint.
2. Buccal branch is a branch from the anterior division of the mandibular nerve, and it emerges from behind the mandibular ramus.
3. Lingual nerve is a branch from the posterior division of the mandibular nerve, and it arcs around the submandibular duct.
4. Ophthalmic nerve is a branch from the anterior division of the mandibular nerve, and it arises in the middle cranial fossa.

A 2, 3

CORRECT

B 1, 3

C 3, 4

D 1, 4

## RIGHT ANSWER

OK A. 2, 3

## WHY THIS IS RIGHT

The mandibular nerve (V3) is the third division of the trigeminal nerve and is the only division with both sensory and motor fibers. After passing through the foramen ovale, it divides into anterior and posterior divisions in the infratemporal fossa.

Anterior division (mainly motor) Branches include:

- Masseteric nerve
- Deep temporal nerves
- Nerve to lateral pterygoid
- Buccal nerve (long buccal) - sensory branch that passes behind the mandibular ramus to supply the cheek mucosa and skin.

Posterior division (mainly sensory) Branches include:

- Auriculotemporal nerve
- Lingual nerve
- Inferior alveolar nerve

Important anatomical points:

- Lingual nerve loops around the submandibular duct in the floor of the mouth.
- Auriculotemporal nerve arises from the posterior division, not the anterior division.
- Ophthalmic nerve (V1) is a separate division of the trigeminal nerve, not a branch of V3.

## QUESTION

Arrange in sequence the structures involved in the direct pathway:

1. Striatum
2. Globus pallidus
3. Substantia nigra
4. Thalamus
5. Cortex
6. Subthalamic nucleus

A 1, 2, 3, 4, 5

B 5, 4, 2, 3, 1

C 5, 1, 2, 6, 3, 4

CORRECT

D 1, 3, 4, 2, 5

## RIGHT ANSWER

OK

C. 5, 1, 2, 6, 3, 4

## WHY THIS IS RIGHT

The direct pathway of the basal ganglia facilitates initiation and execution of voluntary movement by reducing inhibitory output from the basal ganglia to the thalamus.

Sequence of the direct pathway:

1. Cortex stimulates the striatum (caudate + putamen).
2. Striatum inhibits the globus pallidus internus / substantia nigra pars reticulata.
3. This reduces inhibitory output from the basal ganglia to the thalamus.
4. Thalamus then excites the motor cortex, promoting movement.

Correct sequence:

Cortex -> Striatum -> Globus pallidus -> Substantia nigra -> Thalamus

Which corresponds to: 5 -> 1 -> 2 -> 3 -> 4

## QUESTION

**A 55-year-old man develops intracranial meningeal bleeding secondary to skull base osteomyelitis. Different regions of the dura mater are involved, and angiography shows distinct arterial sources depending on the cranial fossa involved. Which combination best identifies the major arterial supply to the dura mater in the three cranial fossae?**

**A** Anterior cranial fossa - Middle meningeal artery; Middle cranial fossa - Ascending pharyngeal artery; Posterior cranial fossa - Ophthalmic artery

**B** Anterior cranial fossa - Ethmoidal arteries; Middle cranial fossa - Middle meningeal artery; Posterior cranial fossa - Meningeal branches of vertebral & occipital arteries CORRECT

**C** Anterior cranial fossa - Ascending pharyngeal artery; Middle cranial fossa - Ophthalmic artery; Posterior cranial fossa - Middle meningeal artery

**D** Anterior cranial fossa - Deep temporal artery; Middle cranial fossa - Ascending palatine artery; Posterior cranial fossa - Maxillary artery

## RIGHT ANSWER

**OK** **B. Anterior cranial fossa - Ethmoidal arteries; Middle cranial fossa - Middle meningeal artery; Posterior cranial fossa - Meningeal branches of vertebral & occipital arteries**

## WHY THIS IS RIGHT

The dura mater receives arterial supply from different arteries in each cranial fossa, mainly branches of the internal carotid and external carotid systems. Major arterial supply:

- Anterior cranial fossa:

- o Anterior and posterior ethmoidal arteries (branches of the ophthalmic artery from the internal carotid artery)

- Middle cranial fossa:

- o Middle meningeal artery (branch of the maxillary artery from the external carotid artery)

- o Enters the skull through the foramen spinosum

- Posterior cranial fossa:

- o Meningeal branches of the vertebral and occipital arteries

The middle meningeal artery is the most clinically important because its rupture can cause an epidural hematoma, often associated with temporal bone fractures.

## QUESTION

A 62-year-old man presents with persistent headaches that change location depending on intracranial irritation. MRI shows localized pachymeningitis affecting different cranial fossae at different times. The neurologist explains that each cranial fossa has a different primary sensory innervation of the dura, which helps explain the variation in referred pain patterns. Which combination correctly identifies the major nerve distribution to the dura mater in the three cranial fossae?

- A** Anterior cranial fossa - V2; Middle cranial fossa - C1-C3; Posterior cranial fossa - V1
- B** Anterior cranial fossa - V3; Middle cranial fossa - V1; Posterior cranial fossa - C1-C3
- C** Anterior cranial fossa - V1; Middle cranial fossa - V3 (meningeal branches); Posterior cranial fossa - C1-C3 <sup>CORRECT</sup>
- D** Anterior cranial fossa - V2; Middle cranial fossa - V3 via auriculotemporal nerve only; Posterior cranial fossa - V1

## RIGHT ANSWER

- OK** C. Anterior cranial fossa - V1; Middle cranial fossa - V3 (meningeal branches); Posterior cranial fossa - C1-C3

## WHY THIS IS RIGHT

The dura mater of the cranial cavity receives sensory innervation from branches of the trigeminal nerve and upper cervical nerves, which explains the pattern of referred headache pain depending on which cranial fossa is involved. Major sensory innervation of cranial fossae:

- Anterior cranial fossa:

- o Mainly supplied by ophthalmic division of trigeminal nerve (V1)
- o Especially via anterior and posterior ethmoidal nerves

- Middle cranial fossa:

- o Supplied mainly by meningeal branches of the mandibular division (V3)
- o Includes the nervus spinosus (meningeal branch of V3)

- Posterior cranial fossa:

- o Supplied primarily by upper cervical nerves (C1-C3)
- o Also contributions from vagus and hypoglossal nerves

Irritation of different dural regions produces distinct headache referral patterns because of these different sensory nerve supplies.

QUESTION

Which of the following descending tracts in the spinal cord remains uncrossed?

- A

Tectospinal tract
- B

Rubrospinal tract
- C

Vestibulospinal tract

CORRECT
- D

Pyramidal tract

RIGHT ANSWER

OK

C. Vestibulospinal tract

WHY THIS IS RIGHT

Major Descending Tracts and Their Crossing

| Tract                           | Origin                 | Crossing                                                 | Function                                                    |
|---------------------------------|------------------------|----------------------------------------------------------|-------------------------------------------------------------|
| Pyramidal (Corticospinal) tract | Motor cortex           | Crosses at pyramidal decussation in the medulla          | Voluntary motor control                                     |
| Rubrospinal tract               | Red nucleus (midbrain) | Crosses immediately in the ventral tegmental decussation | Facilitates flexor muscles                                  |
| Tectospinal tract               | Superior colliculus    | Crosses in dorsal tegmental decussation                  | Reflex head/neck movements to visual stimuli                |
| Vestibulospinal tract           | Vestibular nuclei      | Remains uncrossed (mainly ipsilateral)                   | Maintains posture and balance, facilitates extensor muscles |

## QUESTION

| Which of the following is not true about the cavernous sinus thrombosis?

- A** Loss of sensation around the orbit
- B** Loss of jaw jerk CORRECT
- C** Infection spreads to cavernous sinus from the danger area of face via inferior ophthalmic vein
- D** Superior ophthalmic vein serves as a both incoming as well as outgoing channel to cavernous sinus because it is valveless

## RIGHT ANSWER

**OK** B. Loss of jaw jerk

## WHY THIS IS RIGHT

Cavernous sinus thrombosis typically affects the cranial nerves that run within the cavernous sinus, leading to characteristic neurological deficits. Structures commonly involved include:

- CN III (Oculomotor)
- CN IV (Trochlear)
- CN V1 (Ophthalmic division of trigeminal nerve)
- CN V2 (Maxillary division of trigeminal nerve)
- CN VI (Abducens nerve)
- Internal carotid artery

## Clinical Features:

- Loss of sensation around the orbit -> due to involvement of CN V1 (ophthalmic division).
- Infection from the "danger area" of the face can spread to the cavernous sinus via facial vein -> angular vein -> superior/inferior ophthalmic veins, because these veins are valveless.
- Superior ophthalmic vein acts as both inflow and outflow channel because it lacks valves.

Jaw jerk reflex is mediated by the mandibular division of trigeminal nerve (CN V3) via the mesencephalic nucleus. CN V3 does NOT pass through the cavernous sinus, so jaw jerk is not affected in cavernous sinus thrombosis.



## QUESTION

A patient presents with right-sided hemiparesis and hemisensory loss of the leg and foot. He is unable to correctly identify objects and has significant personality changes. The occlusion of which of the following arteries could be responsible for these symptoms?

**A** Anterior cerebral artery

CORRECT

**B** Middle cerebral artery

**C** Posterior cerebral artery

**D** Internal carotid artery

## RIGHT ANSWER

**OK** A. Anterior cerebral artery

## WHY THIS IS RIGHT

The anterior cerebral artery (ACA) supplies the medial surface of the frontal and parietal lobes, including the paracentral lobule, which represents the motor and sensory areas for the lower limb (leg and foot).

Clinical features of ACA occlusion:

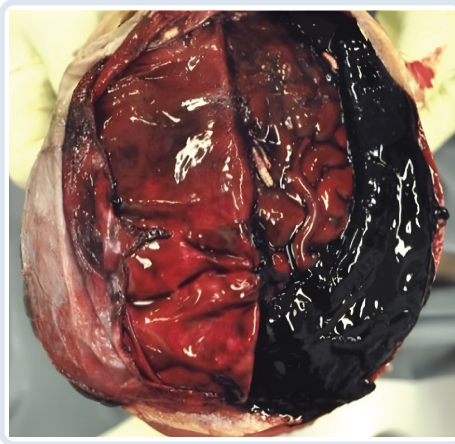
- Contralateral weakness of the leg and foot
- Contralateral sensory loss in the leg
- Behavioral and personality changes due to medial frontal lobe involvement
- Possible abulia (lack of motivation) and impaired judgment

Why other options are incorrect:

- Middle cerebral artery (MCA): affects face and upper limb, aphasia or neglect.
- Posterior cerebral artery (PCA): mainly causes visual deficits (contralateral homonymous hemianopia).
- Internal carotid artery: produces combined ACA and MCA deficits.

## QUESTION

**Bleeding as shown in the image is due to which of the following vessels?**



CORRECT

- A** Bridging veins
- B** Middle meningeal artery-anterior division
- C** Middle meningeal artery-posterior division
- D** Circle of Willis

## RIGHT ANSWER

**OK** A. Bridging veins

## WHY THIS IS RIGHT

The image shows a subdural hemorrhage, characterized by blood accumulation between the dura mater and arachnoid mater over the surface of the brain.

Subdural hemorrhage occurs due to rupture of bridging veins.

- These veins connect cortical veins of the brain to the dural venous sinuses (especially the superior sagittal sinus).
- They traverse the subdural space, making them vulnerable to tearing.

Mechanism of Injury:

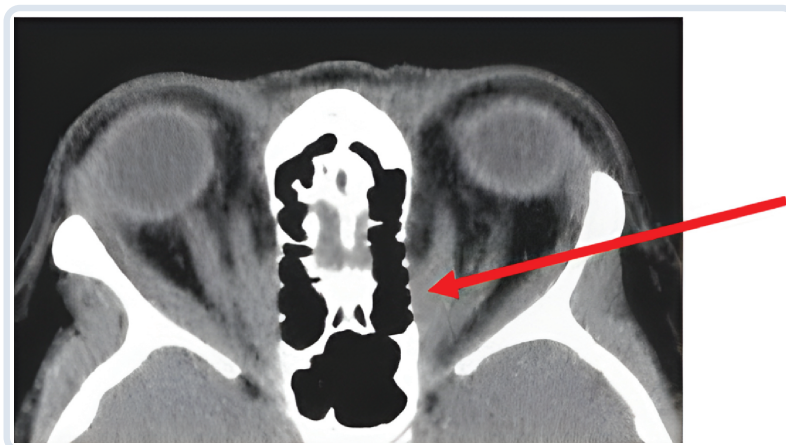
- Usually caused by acceleration-deceleration injuries (e.g., road traffic accidents).
- Brain moves within the skull, stretching and tearing the bridging veins.

Characteristic Features of Subdural Hemorrhage:

- Crescent-shaped hematoma on CT scan
- Venous bleeding -> slower onset of symptoms
- Can cross suture lines but does not cross the midline due to falx cerebri

## QUESTION

At which level does the nerve supply for the marked structure arise?



CORRECT

**A** Aqueduct of Sylvius

**B** Sub thalamic nuclei

**C** Decussation of pyramidal tract

**D** Thalamus

RIGHT ANSWER

OK

**A. Aqueduct of Sylvius**

## WHY THIS IS RIGHT

The marked structure in the image is the medial rectus muscle, one of the extraocular muscles responsible for adduction of the eyeball (movement of the eye toward the nose).

The medial rectus muscle is supplied by the oculomotor nerve (cranial nerve III).

- The oculomotor nerve nucleus is located in the midbrain at the level of the superior colliculus.
- This level corresponds anatomically to the cerebral aqueduct (Aqueduct of Sylvius).

Since the nerve supplying the medial rectus (CN III) originates in the midbrain near the cerebral aqueduct, the correct answer is: Aqueduct of Sylvius

## QUESTION

A 40 year old female presents with symptoms of cavernous sinus thrombosis, including severe headache, visual disturbances, and facial swelling. Which of the following is not a tributary of the cavernous sinus?

A Superior ophthalmic vein

B Inferior ophthalmic vein

C Deep facial vein

CORRECT

D Sphenoparietal sinus

## RIGHT ANSWER

OK C. Deep facial vein

## WHY THIS IS RIGHT

The cavernous sinus is a dural venous sinus located on either side of the sella turcica. It receives venous blood from the orbit, brain, and superficial facial regions. Tributaries of the cavernous sinus include:

- Superior ophthalmic vein
- Inferior ophthalmic vein
- Sphenoparietal sinus
- Superficial middle cerebral vein

Deep facial vein is not a direct tributary of the cavernous sinus. Instead:

- It drains into the pterygoid venous plexus.
- The pterygoid plexus communicates with the cavernous sinus via emissary veins.

Clinical relevance:

Infections from the “danger triangle of the face” can spread to the cavernous sinus through connections between the facial vein -> angular vein -> superior ophthalmic vein.

## QUESTION

A 45-year-old man presents to the emergency department after a motor vehicle accident with severe head trauma. His GCS is 5. On examination, there is a loss of sensation below the level of the neck and flaccid paralysis of all four limbs. Which of the following structures pass through the same cranial foramen as the structure involved in this patient?

- A Hypoglossal nerve
- B Cranial root of accessory nerve
- C Spinal root of accessory nerve**
- D Middle meningeal artery

CORRECT

## RIGHT ANSWER

- OK
- C. Spinal root of accessory nerve**

## WHY THIS IS RIGHT

The spinal root of the accessory nerve (CN XI) enters the skull through the foramen magnum, ascends briefly into the cranial cavity, and then exits the skull with the cranial root of CN XI through the jugular foramen. Structures passing through the foramen magnum:

- Medulla oblongata
- Spinal roots of the accessory nerve (CN XI)
- Vertebral arteries
- Anterior and posterior spinal arteries
- Meninges

Why others are incorrect:

- A. Hypoglossal nerve (CN XII) -> passes through the hypoglossal canal.
- B. Cranial root of accessory nerve -> exits through the jugular foramen.
- D. Middle meningeal artery -> enters through the foramen spinosum.

## QUESTION

| All of the following tracts pass through inferior cerebellar peduncle except:

A Posterior spinocerebellar

B Anterior spinocerebellar

CORRECT

C Cuneocerebellar

D Olivocerebellar

## RIGHT ANSWER

OK B. Anterior spinocerebellar

## WHY THIS IS RIGHT

The inferior cerebellar peduncle (restiform body) connects the medulla to the cerebellum and mainly carries afferent (sensory) fibers to the cerebellum involved in proprioception and coordination.

Major Tracts Passing Through the Inferior Cerebellar Peduncle:

- Posterior (dorsal) spinocerebellar tract
- Carries unconscious proprioception from trunk and lower limbs.
- Cuneocerebellar tract
- Carries unconscious proprioception from upper limbs.
- Olivocerebellar fibers
- Arise from the inferior olivary nucleus and play an important role in motor learning and coordination.

Anterior (ventral) spinocerebellar tract passes through the superior cerebellar peduncle, not the inferior peduncle.

## QUESTION

Which of the following is part of the complete syndrome triad associated with Anterior Choroidal Artery Syndrome?

- A Bilateral hemiplegia
- B Contralateral hemisensory loss**
- C Bitemporal hemianopia
- D Ipsilateral homonymous hemianopia

CORRECT

## RIGHT ANSWER

- B. Contralateral hemisensory loss**

## WHY THIS IS RIGHT

Anterior choroidal artery syndrome classically presents with a triad due to infarction of structures supplied by the anterior choroidal artery, a branch of the internal carotid artery.  
Classic triad:

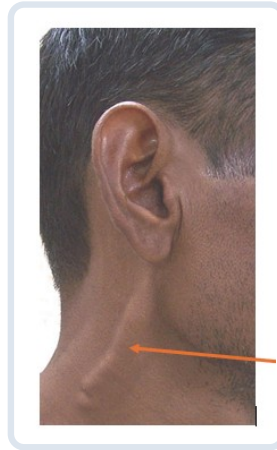
1. Contralateral hemiplegia -> due to involvement of the posterior limb of internal capsule (corticospinal tract).
2. Contralateral hemisensory loss -> due to involvement of thalamocortical sensory fibers.
3. Contralateral homonymous hemianopia -> due to damage to the optic tract or lateral geniculate body.

Why other options are incorrect:

- A. Bilateral hemiplegia: not typical; the deficit is contralateral and unilateral.
- C. Bitemporal hemianopia: occurs with optic chiasm lesions (e.g., pituitary tumors).
- D. Ipsilateral homonymous hemianopia: visual field loss is contralateral to the lesion.

## QUESTION

A patient with known history of leprosy presents to the clinic. On examination, a thickened nerve is noted in the neck (as shown in the image). Which of the following nerves is most likely involved?



A Auriculotemporal nerve

**B Great auricular nerve**

CORRECT

C Spinal accessory nerve

D Lesser occipital nerve

## RIGHT ANSWER

OK

**B. Great auricular nerve**

## WHY THIS IS RIGHT

In leprosy, superficial sensory nerves are commonly involved, leading to palpable thickening.

The great auricular nerve (C2-C3) runs superficially over the sternocleidomastoid in the neck and supplies the skin over the parotid region and lower auricle, making it a classic nerve affected in leprosy.

Auriculotemporal and lesser occipital nerves are less commonly thickened, while the spinal accessory nerve is motor.



## QUESTION

| Which of the following findings is characteristic of Frey's syndrome?

**A** Sweating & flushing over preauricular region

CORRECT

**B** Pain over preauricular region

**C** Anhidrosis, anophthalmosis, miosis

**D** Anhidrosis, anophthalmosis, mydriasis

## RIGHT ANSWER

OK

**A. Sweating & flushing over preauricular region**

## WHY THIS IS RIGHT

Frey's syndrome occurs due to aberrant regeneration of auriculotemporal nerve fibers after parotid gland injury or surgery.

Parasympathetic fibers meant for salivation instead stimulate sweat glands, causing gustatory sweating and flushing over the preauricular area.

The other options describe features of Horner syndrome, not Frey's syndrome.

## QUESTION

A patient presents to the OPD with the right eye positioned downwards and rotated outwards. Which of the following cranial nerves is most likely injured?

A III

CORRECT

B IV

C VI

D VII

## RIGHT ANSWER

OK  
A. III

## WHY THIS IS RIGHT

The correct answer is Oculomotor nerve (CN III).

Injury to CN III causes unopposed action of lateral rectus (CN VI) and superior oblique (CN IV), resulting in the eye being positioned downward and outward.

Associated features include ptosis and dilated pupil due to loss of levator palpebrae and parasympathetic fibers.

## QUESTION

A patient presents with ptosis and ophthalmoplegia. The condition is diagnosed as Superior Orbital Fissure Syndrome. Which of the following cranial nerves are most likely compressed in this case?

A II, III, IV, VI

B II, III, IV, V1

C II, IV, V1, VI

D III, IV, V1, VI

CORRECT

## RIGHT ANSWER

OK

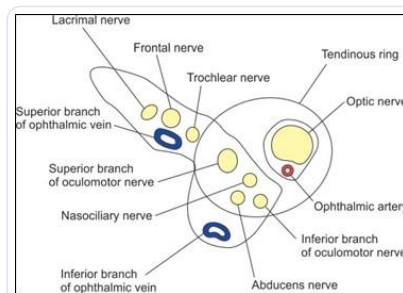
D. III, IV, V1, VI

## WHY THIS IS RIGHT

Superior orbital fissure syndrome involves compression of structures passing through the fissure, including oculomotor (III), trochlear (IV), ophthalmic division of trigeminal (V1), and abducens (VI) nerves.

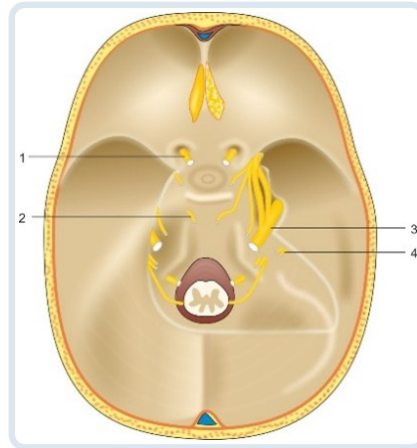
This explains ptosis and ophthalmoplegia due to involvement of extraocular muscle nerves.

The optic nerve (II) passes through the optic canal, not the superior orbital fissure.



## QUESTION

A patient presents with a unilateral throbbing headache, photophobia, and excessive lacrimation. He also complains of hemifacial pain on clenching of teeth. On examination, pupillary reflex, light reflex, and accommodation reflex are normal. Which of the following marked nerves is involved in the above scenario?



A 1

B 2

C 3

CORRECT

D 4

RIGHT ANSWER

OK

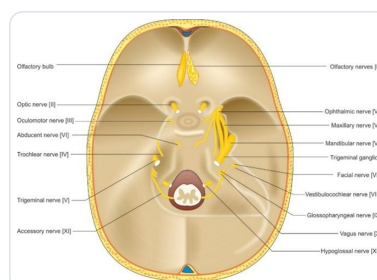
C. 3

## WHY THIS IS RIGHT

The clinical features-unilateral throbbing headache, photophobia, lacrimation, and hemifacial pain aggravated by clenching-point to involvement of the trigeminal nerve (CN V), the chief sensory nerve of the face.

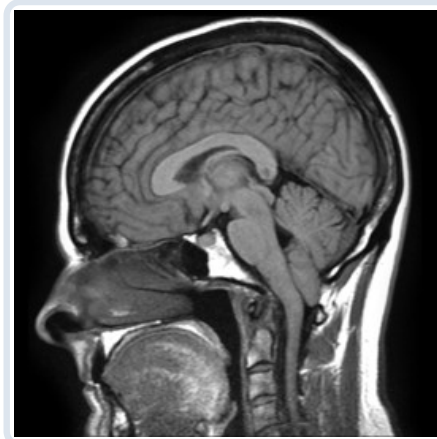
Normal pupillary, light, and accommodation reflexes rule out oculomotor involvement.

Thus, the marked nerve 3, corresponding to the trigeminal nerve, is responsible for facial pain and trigeminal autonomic symptoms.



## QUESTION

## | Diagnose the following MRI



- A** Corpus callosal agenesis
- B** Vein of Galen malformation
- C** Dandy Walker malformation

**D** Arnold Chiari malformation

CORRECT

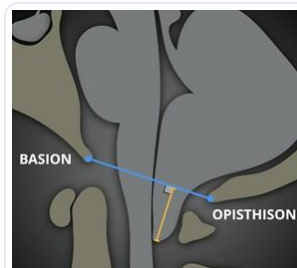
## RIGHT ANSWER

**OK** D. Arnold Chiari malformation

## WHY THIS IS RIGHT

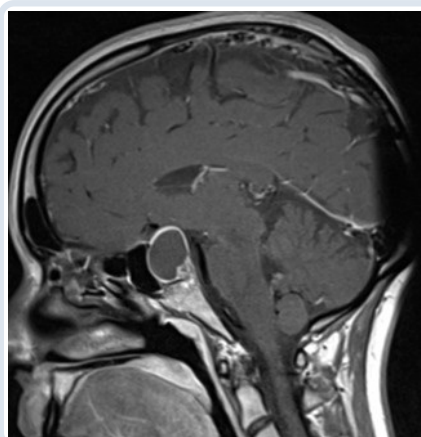
It is characterized by downward herniation of cerebellar tonsils through the foramen magnum, often with brainstem compression (defined as >5 mm below base of skull from basion-opisthion line)

Dandy-Walker malformation shows cystic dilatation of the 4th ventricle with enlarged posterior fossa, corpus callosal agenesis causes colpocephaly, and vein of Galen malformation is a vascular anomaly-not hindbrain herniation.



## QUESTION

A 35-year-old female presented with the following lesion. The abnormality seen following the lesion is:



A Single vision field loss

**B. Bitemporal hemianopia**

CORRECT

C Complete blindness

D Homonymous hemianopia

## RIGHT ANSWER

**B. Bitemporal hemianopia**

## WHY THIS IS RIGHT

A craniopharyngioma arises in the suprasellar region and commonly compresses the optic chiasm from below. This selectively damages the crossing nasal retinal fibers, resulting in loss of temporal visual fields of both eyes. Lesions posterior to the chiasm causes homonymous hemianopia, while complete blindness requires bilateral optic nerve damage.

## QUESTION

| The lesion in Brodmann's area 22 causes:

**A** Receptive aphasia

CORRECT

**B** Poor repetition of language

**C** Expressive aphasia

**D** Poor naming

## RIGHT ANSWER

OK

**A. Receptive aphasia**

## WHY THIS IS RIGHT

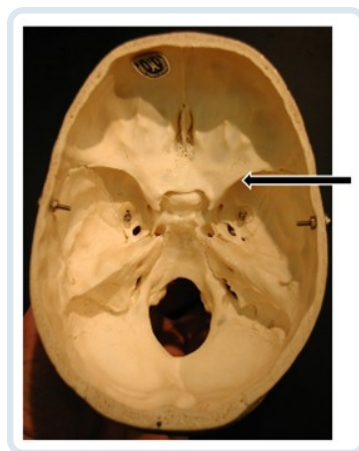
Brodmann area 22 corresponds to Wernicke's area in the dominant temporal lobe, responsible for language comprehension.

Lesions here cause fluent but meaningless speech with impaired understanding, i.e., receptive aphasia.

Expressive aphasia is due to Broca's area (areas 44-45), while repetition and naming deficits depend on other language network components.

## QUESTION

What will be the clinical presentation if the nerve passing through the marked region has been injured?



CORRECT

**A** Loss of sensation on forehead and dorsum of nose

**B** Loss of sensation in jaw area

**C** Loss of sensation in maxillary area of face

**D** Loss of sensation in the mucosa of nasopharynx

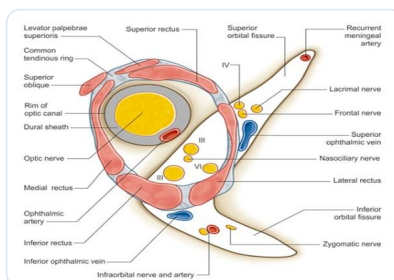
RIGHT ANSWER

**OK** **A. Loss of sensation on forehead and dorsum of nose**

## WHY THIS IS RIGHT

The nerve passing through the marked region is the ophthalmic division of trigeminal nerve (V1), which supplies forehead, scalp, upper eyelid, and dorsum of nose.

Maxillary area is supplied by V2, jaw area by V3, and nasopharyngeal mucosa mainly by V2/IX, not V1.





## QUESTION

Cranial nerve X carries multiple functional components. Which nucleus or functional group does not contribute fibers to the vagus nerve?

A GSE

CORRECT

B GSA

C GVE

D GVA

## RIGHT ANSWER

OK  
A. GSE

## WHY THIS IS RIGHT

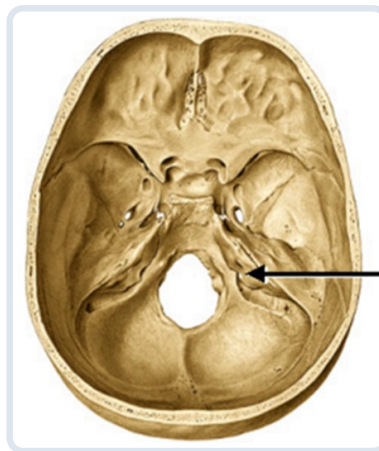
The correct answer is GSE (General Somatic Efferent).

The vagus nerve (CN X) carries GVE (parasympathetic) fibres from the dorsal motor nucleus, GVA fibres from thoracoabdominal viscera, and GSA fibres from the external auditory canal and dura.

Its motor fibres are branchial efferent (SVE) to muscles of pharynx and larynx, not true GSE, which supply extraocular and tongue muscles only.

## QUESTION

Which of the following nerves does not pass through the foramen indicated in the given image?



CORRECT

A XII

B IX

C XI

D X

RIGHT ANSWER

OK

A. XII

## WHY THIS IS RIGHT

The marked foramen in the image is the jugular foramen, which is the second largest foramen of the skull (after the foramen magnum). The jugular foramen is located in the posterior cranial fossa between the petrous part of the temporal bone and the occipital bone.

Three compartments of jugular foramen:

1. Anterior (Pars nervosa) - Contains:

- o Inferior petrosal sinus (IPS)

2. Middle (Pars vascularis) - Contains:

- o Glossopharyngeal nerve (CN IX)

- o Vagus nerve (CN X)

- o Accessory nerve (CN XI) - specifically the cranial root which joins the vagus

3. Posterior (Pars vascularis) - Contains:

- o Internal jugular vein (IJV) - continuation of sigmoid sinus

The hypoglossal nerve (CN XII) does NOT pass through the jugular foramen. Instead, it passes through its own separate opening called the hypoglossal canal (anterior condylar canal), which is located anteriorly and medially to the jugular foramen, above the occipital condyle.

## QUESTION

In the given image, muscles A and B are labelled. Which of the following nerves supply the muscles A and B, respectively?



**A** Facial nerve & Nerve to mylohyoid

CORRECT

**B** Facial & Glossopharyngeal nerve

**C** Facial & Hypoglossus

**D** Facial & Vagus

## RIGHT ANSWER

**OK** A. Facial nerve & Nerve to mylohyoid

## WHY THIS IS RIGHT

The cadaveric image shows the digastric muscle, which is a unique "hybrid muscle" of the neck with dual innervation:

- Muscle A (Anterior belly of digastric): This muscle is derived from the first pharyngeal arch and is supplied by the mandibular nerve (V3), specifically through the nerve to mylohyoid branch. The nerve to mylohyoid runs along the mylohyoid muscle and sends a branch to innervate the anterior belly of the digastric.
- Muscle B (Posterior belly of digastric): This muscle is derived from the second pharyngeal arch and is supplied by the facial nerve (CN VII), specifically through the digastric branch of the facial nerve that arises near the stylomastoid foramen.

The digastric muscle is classified as a hybrid muscle because its two bellies have different embryological origins and nerve supplies:

- First arch -> Mandibular nerve (V3) -> Nerve to mylohyoid -> Anterior belly
- Second arch -> Facial nerve (CN VII) -> Posterior belly

## QUESTION

A patient cannot identify objects but she can see the colour, texture, shape. What is the site of the lesion?

A Medial parietal area

B Lateral parietal area

C Infra temporal area

D Occipital area

CORRECT

## RIGHT ANSWER

OK D. Occipital area

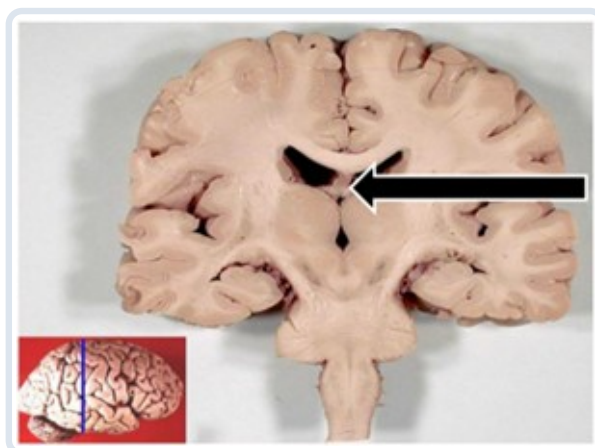
## WHY THIS IS RIGHT

The clinical picture is visual agnosia-vision is intact (colour, shape, texture perceived) but object recognition is impaired. This occurs due to lesions in visual association cortex (Brodmann areas 18 and 19) of the occipital lobe, not the primary visual cortex (area 17).

Parietal areas are involved in spatial perception, and infratemporal lesions cause visual memory/face recognition deficits rather than basic object agnosia.

## QUESTION

Efferent to which nucleus of thalamus from indicated structure in the image?



**A** Anterior

CORRECT

**B** Lateral

**C** Ventro-postero-lateral

**D** Pulvinar

RIGHT ANSWER

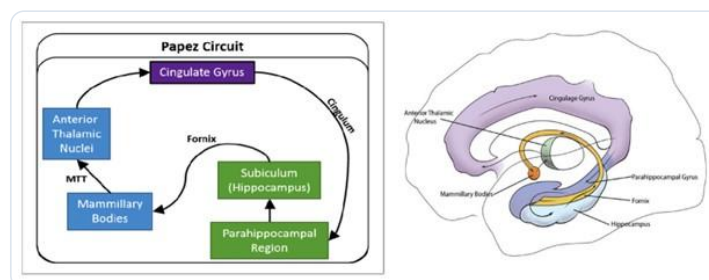
**OK** A. Anterior

## WHY THIS IS RIGHT

The correct answer is Anterior nucleus of thalamus.

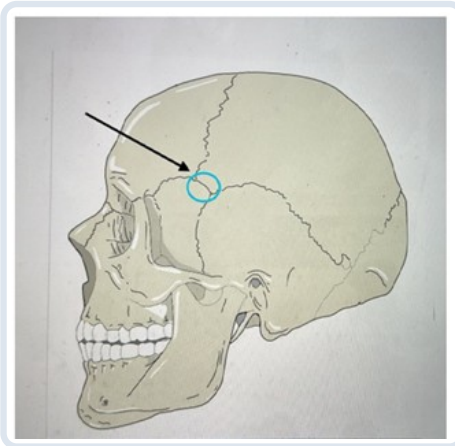
The indicated structure is the fornix, which carries efferent fibres from the hippocampus to the mammillary bodies.

From the mammillary bodies, impulses are relayed via the mammillothalamic tract to the anterior thalamic nucleus as part of the Papez circuit for memory.



## QUESTION

| The sulcus located deep to the marked structure is?



- A Central sulcus
- B Stem of the lateral sulcus**
- C Inferior frontal sulcus
- D Superior temporal sulcus

CORRECT

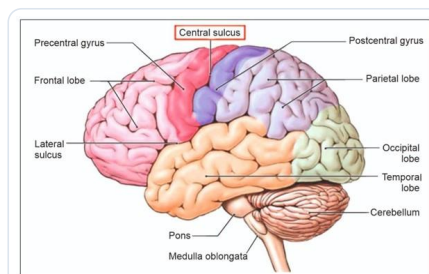
## RIGHT ANSWER

OK

**B. Stem of the lateral sulcus**

## WHY THIS IS RIGHT

The marked structure corresponds to the pterion, which overlies the stem of the lateral (Sylvian) sulcus on the cerebral surface. Deep to this region lie the insula and proximal Sylvian fissure, making the stem of the lateral sulcus the key anatomical relation. Central sulcus and frontal/temporal sulci are positioned more superiorly or posteriorly and are not directly related to the pterion.



## QUESTION

Which type of sensation is carried by the 2nd order neuron of the spinal nucleus of the trigeminal nerve?

A Proprioception

B Touch

C Pain

CORRECT

D Vibration

## RIGHT ANSWER

OK C. Pain

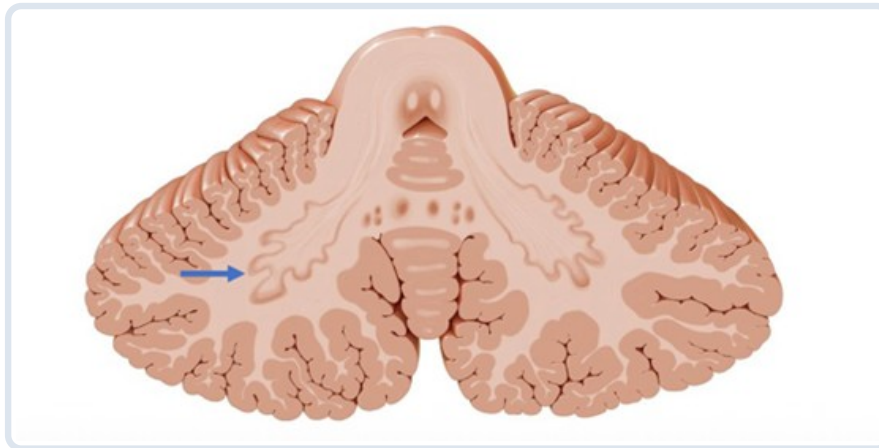
## WHY THIS IS RIGHT

No explanation was provided in the source quiz.

| Sensory Nucleus                                 | Location | Function                                  |
|-------------------------------------------------|----------|-------------------------------------------|
| Mesencephalic Nucleus of Trigeminal Nerve (MNT) | Midbrain | Proprioception from jaw muscles and teeth |
| Chief Sensory Nucleus of Trigeminal Nerve (CNT) | Pons     | Touch and pressure sensation from face    |
| Spinal Nucleus of Trigeminal Nerve (SNT)        | Medulla  | Pain and temperature sensation from face  |

## QUESTION

Indicated structure gives origin to which of the following fibre?



A Cerebello-rubral

B Cerebello-reticular

C Cerebello-vestibular

D Dentato-rubral

CORRECT

## RIGHT ANSWER

OK

D. Dentato-rubral

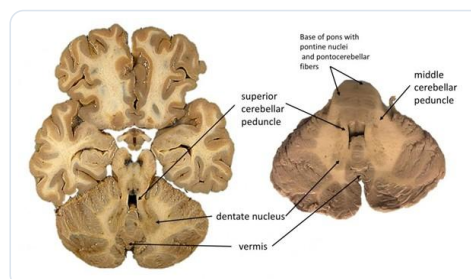
## WHY THIS IS RIGHT

The correct answer is Dentato-rubral.

The indicated structure is the dentate nucleus, the largest deep cerebellar nucleus and the main output nucleus of the cerebellar hemispheres.

Fibers from the dentate nucleus pass through the superior cerebellar peduncle, decussate, and project to the contralateral red nucleus as dentato-rubral fibers.

Cerebello-reticular and cerebello-vestibular fibers arise mainly from the fastigial nucleus, while cerebello-rubral is a broader term, with dentato-rubral being the precise anatomical pathway.





## QUESTION

**Marked structure is connected to which part of basal nuclei?**



- A** Thalamus
- B** Subthalamic nucleus
- C** Globus pallidum
- D** **Corpus striatum**

CORRECT

## RIGHT ANSWER

OK

**D. Corpus striatum**

## WHY THIS IS RIGHT

The correct answer is Corpus striatum.

The marked structure is the substantia nigra, which is connected to the corpus striatum (caudate + putamen) via the nigrostriatal dopaminergic pathway, essential for motor control.

Degeneration of this pathway leads to Parkinson disease.

Thalamus and subthalamic nucleus are relay/modulatory nuclei, while globus pallidum is an output nucleus, not the primary nigral connection.

## QUESTION

**| Structure lying in the floor of inferior horn of lateral ventricle are all except?**

**A** Collateral eminence

**B** Hippocampus

**C** Fimbria

**D** Tail of caudate nucleus

CORRECT

## RIGHT ANSWER

**OK** **D. Tail of caudate nucleus**

## WHY THIS IS RIGHT

The correct answer is Tail of caudate nucleus.

The floor of the inferior (temporal) horn of the lateral ventricle is formed by the hippocampus, fimbria, and collateral eminence.

The tail of the caudate nucleus runs in the roof of the inferior horn, along with the stria terminalis, and therefore is not a floor structure.

## QUESTION

Which nerve is not the content of superior orbital fissure?

A II

CORRECT

B III

C IV

D VI

## RIGHT ANSWER

OK

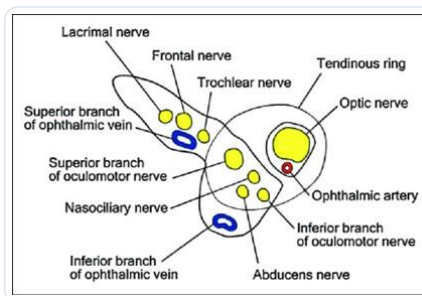
A. II

## WHY THIS IS RIGHT

The correct answer is Optic nerve (CN II).

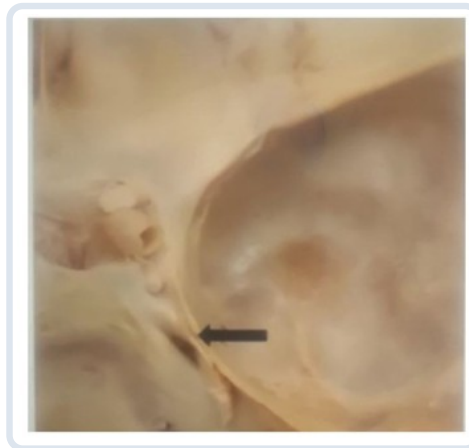
CN II passes through the optic canal, not the superior orbital fissure.

The superior orbital fissure transmits CN III, CN IV, CN VI, and the ophthalmic division of CN V (V1) along with sympathetic fibres.



## QUESTION

Which nerve does the marked structure contain?



- A III
- B IV
- C VI
- D Ophthalmic division

CORRECT

RIGHT ANSWER

OK

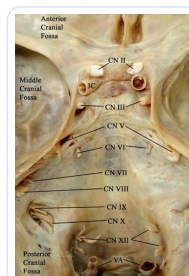
B. IV

## WHY THIS IS RIGHT

The correct answer is Trochlear nerve (CN IV).

The marked structure is the superior orbital fissure, and CN IV uniquely runs in the lateral wall of the cavernous sinus and passes through the superior orbital fissure outside the common tendinous ring.

CN III, CN VI, and the ophthalmic division of CN V traverse different compartments or positions within the fissure, helping differentiate CN IV in image-based questions.



## QUESTION

**I Olfactory sensation is transmitted by all of the following nerves, except:**

- A** Trigeminal nerve
- B** Glossopharyngeal nerve
- C** Hypoglossal nerve
- D** Vagus nerve

CORRECT

## RIGHT ANSWER

- OK** **C. Hypoglossal nerve**

## WHY THIS IS RIGHT

CN XII is a purely motor nerve supplying intrinsic and extrinsic muscles of the tongue, with no sensory component. Trigeminal, glossopharyngeal, and vagus nerves contribute general sensory input (irritant, pungent stimuli) that modulates perceived olfactory sensation, but CN XII has no such role.

## QUESTION

A woman has a difficulty opening her mouth but no problem in closing it. Which of the following is true about the muscle affected in the condition?

1. The muscle attaches close to the temporal mandibular joint.
2. The muscle depresses the mandible.
3. It is attached to the medial pterygoid plate.
4. The muscle is supplied by the mandibular nerve.

A 1, 2, 3, and 4

B 1, 2, and 4

CORRECT

C 1, 3, and 4

D 2, 3, and 4

## RIGHT ANSWER

OK B. 1, 2, and 4

## WHY THIS IS RIGHT

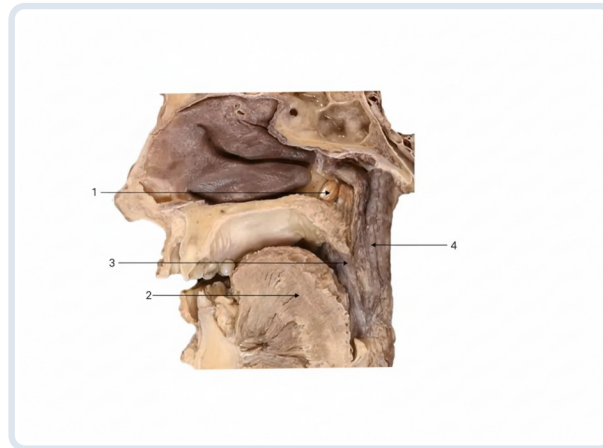
Difficulty in opening the mouth indicates paralysis of a mandible depressor, mainly the lateral pterygoid muscle.

Lateral pterygoid attaches near the TMJ (neck of mandible and articular disc) and is responsible for depression and protrusion of mandible.

It is supplied by the mandibular nerve (V3), but it is not attached to the medial pterygoid plate (that is medial pterygoid), Lateral pterygoid arises from- greater wing of sphenoid & Lateral pterygoid plate.

## QUESTION

Which of these muscles have no role to play in dysphasia or dysarthria?



A 1

B 2

CORRECT

C 3

D 4

## RIGHT ANSWER

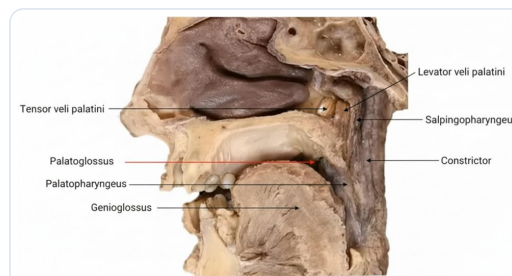
OK B. 2

## WHY THIS IS RIGHT

The correct answer is Option B- Genioglossus muscle.

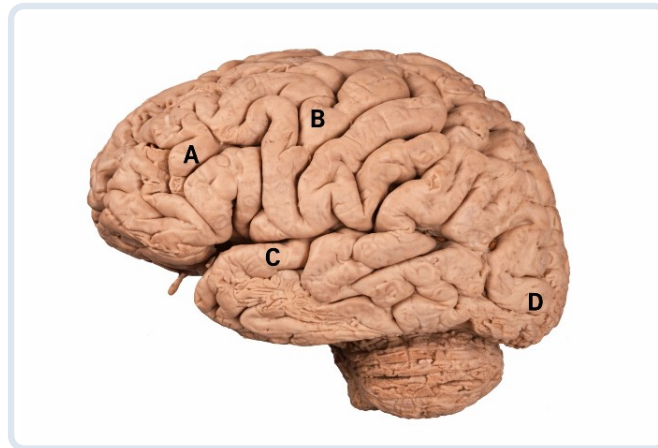
Genioglossus is primarily responsible for protrusion and depression of the tongue and helps prevent airway obstruction, not fine articulation.

Dysarthria and dysphasia mainly involve muscles of the soft palate and pharynx (tensor veli palatini, palatoglossus, palatopharyngeus) that coordinate speech and swallowing.



## QUESTION

Which of the following area is responsible for scanning the visual field?



A A

CORRECT

B B

C C

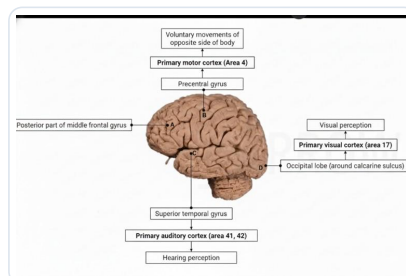
D D

## RIGHT ANSWER

OK A. A

## WHY THIS IS RIGHT

Area A corresponds to the frontal eye field (Brodmann area 8). It controls voluntary conjugate eye movements and is responsible for scanning ocular activity. Lesion causes inability to look voluntarily to the contralateral side, with eyes deviated toward the lesion.





## QUESTION

A patient presents with a drooping of the eyelid, miosis and anhidrosis. A diagnosis of Horner syndrome is made. Where is the lesion most likely located?

A Sympathetic plexus around the internal carotid artery

B Cervical sympathetic chain

CORRECT

C Abducens nerve

D Intercostobrachial nerve

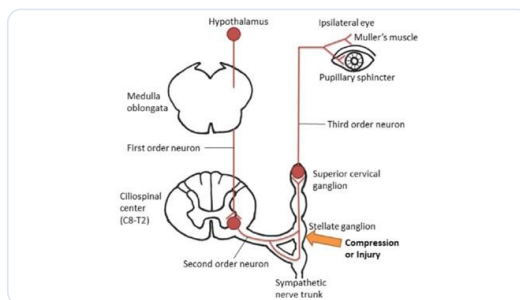
## RIGHT ANSWER

OK B. Cervical sympathetic chain

## WHY THIS IS RIGHT

Horner syndrome results from interruption of the sympathetic pathway supplying the eye, commonly at the cervical sympathetic chain.

Lesion causes ipsilateral ptosis, miosis, and anhidrosis due to loss of postganglionic sympathetic fibres.



## QUESTION

| The marked structure forms the medial wall of which of the following?



- A Third ventricle
- B Fourth ventricle
- C Lateral ventricle**
- D Cisterna magna

CORRECT

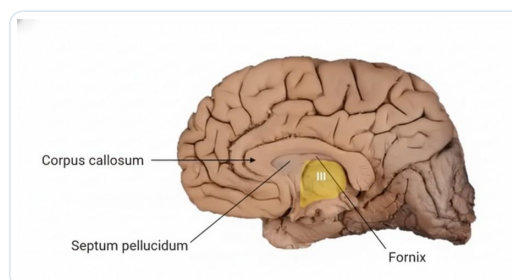
RIGHT ANSWER

OK

**C. Lateral ventricle**

## WHY THIS IS RIGHT

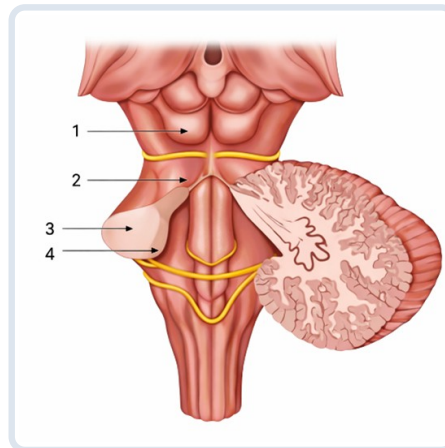
The marked structure is the septum pellucidum, which forms the medial wall of the lateral ventricle. Septum pellucidum is a thin vertical membrane located just below the corpus luteum and above the fornix, it separates the two lateral ventricles from each other. Third ventricle walls are formed by thalamus and hypothalamus, not septum pellucidum.



## QUESTION

Match the following to the corresponding labels in the image.

- a. Inferior cerebellar peduncle
- b. Superior cerebellar peduncle
- c. Inferior colliculus
- d. Middle cerebellar peduncle
- e. Inferior brachium



**A** 1-c, 2-b, 3-d, 4-a

CORRECT

**B** 1-b, 2-d, 3-a, 4-c

**C** 1-d, 2-c, 3-e, 4-b

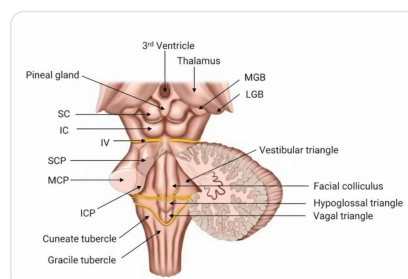
**D** 1-a, 2-e, 3-b, 4-d

## RIGHT ANSWER

**OK** A. 1-c, 2-b, 3-d, 4-a

## WHY THIS IS RIGHT

Inferior colliculus lies on the dorsal midbrain, superior cerebellar peduncle connects cerebellum to midbrain, and middle cerebellar peduncle is the largest cerebellar peduncle connecting pons to cerebellum. Inferior cerebellar peduncle connects medulla to cerebellum, completing the correct anatomical matching. Inferior brachium - not separately labelled here, connects inferior colliculus to medial geniculate body (auditory pathway).



## QUESTION

| Which is not a branch of the vessel known as the Anesthetist's artery?

A Lateral nasal

B **Mental**

CORRECT

C Superior labial

D Inferior labial

## RIGHT ANSWER

OK **B. Mental**

## WHY THIS IS RIGHT

The "Anesthetist's artery" refers to the facial artery because it is commonly encountered and sometimes compressed during regional anesthesia and facial procedures.

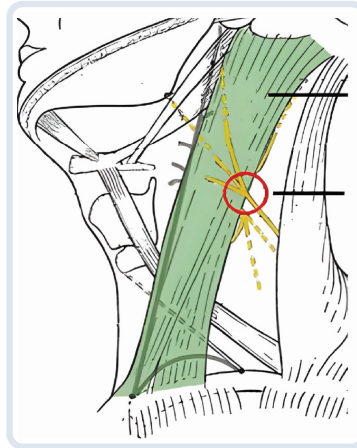
Branches of the facial artery (in the face):

- Inferior labial artery -> supplies the lower lip
- Superior labial artery -> supplies the upper lip and nasal septum
- Lateral nasal artery -> supplies the side of the nose
- Angular artery -> terminal branch at the medial angle of the eye

Mental artery is not a branch of the facial artery. It arises from the inferior alveolar artery, a branch of the maxillary artery, and emerges through the mental foramen to supply the chin and lower lip.

## QUESTION

| 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 CORRECT
- 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

## RIGHT ANSWER

OK

**B. Blocking this point leads to weakness of sternocleidomastoid**

## WHY THIS IS RIGHT

The marked point represents Erb's point (punctum nervosum), located at the midpoint of the posterior border of the sternocleidomastoid muscle. It is the site where the cutaneous branches of the cervical plexus emerge.

Cutaneous branches emerging at Erb's point:

- Lesser occipital nerve (C2)
- Great auricular nerve (C2-C3)
- Transverse cervical nerve (C2-C3)
- Supraclavicular nerves (C3-C4)

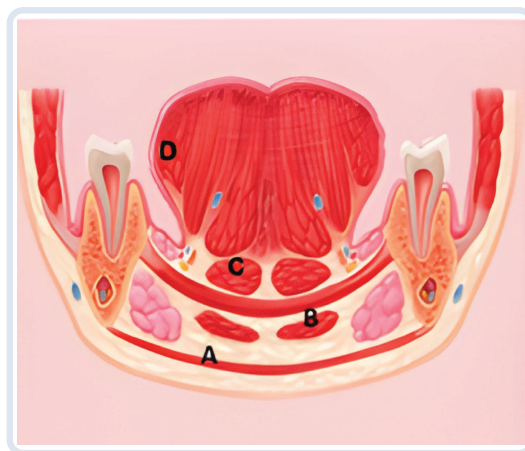
This point is used for cervical plexus block to anesthetize the skin of the neck, ear, and shoulder region during minor surgical procedures.

Why option B is incorrect:

- Blocking Erb's point affects cutaneous sensory nerves, not the spinal accessory nerve (CN XI).
- Sternocleidomastoid weakness occurs with accessory nerve injury, which supplies SCM and trapezius, but this nerve does not emerge at Erb's point.

## QUESTION

Identify the incorrectly matched pair with respect to its nerve supply of the marked structures in the given image.



A Facial nerve

B Trigeminal nerve

C Glossopharyngeal nerve

CORRECT

D Hypoglossal nerve

## RIGHT ANSWER

OK

C. Glossopharyngeal nerve

## WHY THIS IS RIGHT

The muscles of the floor of the mouth and tongue are supplied by different cranial nerves depending on their embryologic origin. Recognizing these innervations helps identify incorrect nerve-muscle pairings.

Key nerve supplies:

- Mylohyoid muscle (A) -> supplied by nerve to mylohyoid, a branch of the inferior alveolar nerve (V3, trigeminal nerve).
- Geniohyoid muscle (B) -> supplied by C1 fibers traveling with the hypoglossal nerve (CN XII).
- Tongue muscles such as genioglossus (D) -> supplied by the hypoglossal nerve (CN XII).
- Glossopharyngeal nerve (CN IX) supplies stylopharyngeus muscle and posterior 1/3 of tongue sensation, not the floor-of-mouth muscles shown.

Therefore, pairing a marked floor-of-mouth muscle with the glossopharyngeal nerve is incorrect, making option C the wrong match.

## QUESTION

During surgery on a 56-year-old man for a squamous cell carcinoma of the neck, the surgeon notices profuse bleeding from the deep cervical artery. Which of the following arteries must be ligated immediately to stop bleeding?

- A Inferior thyroid artery
- B Transverse cervical artery
- C Thyrocervicaltrunk
- D Costocervical trunk**

CORRECT

## RIGHT ANSWER

- OK
- D. Costocervical trunk**

## WHY THIS IS RIGHT

The deep cervical artery is a branch of the costocervical trunk, which itself arises from the subclavian artery. Therefore, severe bleeding from the deep cervical artery can be controlled by ligation of the costocervical trunk, the parent vessel supplying it.

- Subclavian artery branches (relevant here):

- o Thyrocervical trunk
- o Costocervical trunk

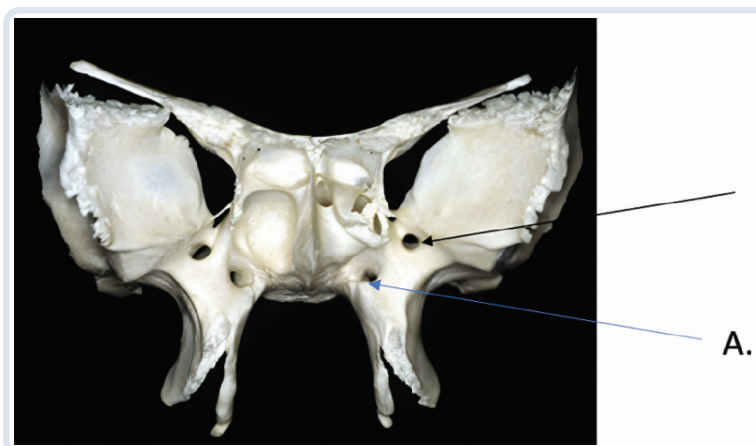
- Costocervical trunk branches:

- o Deep cervical artery - supplies deep muscles of the neck and participates in anastomosis with the descending branch of the occipital artery.
- o Superior intercostal artery

Since the deep cervical artery originates from the costocervical trunk, ligating the costocervical trunk will effectively control hemorrhage.

## QUESTION

The artery passing through the structure marked A is a branch of which part of the maxillary artery?



- A** First part
- B** Second part
- C** Third part
- D** Fourth part

CORRECT

RIGHT ANSWER

**OK** C. Third part

## WHY THIS IS RIGHT

The marked structure A is the foramen rotundum of the sphenoid bone.

The maxillary nerve (V2) passes through the foramen rotundum to enter the pterygopalatine fossa. In this region, the maxillary artery gives branches from its third (pterygopalatine) part, which supply structures in the pterygopalatine fossa and pass through nearby foramina.

Therefore, the artery passing through this region (e.g., infraorbital artery, descending palatine artery, sphenopalatine artery) arises from the third part of the maxillary artery.

Maxillary artery is divided by lateral pterygoid into 3 parts:

1. First (mandibular part) - branches related to mandible (deep auricular, middle meningeal, inferior alveolar).
2. Second (pterygoid part) - muscular branches.
3. Third (pterygopalatine part) - branches in pterygopalatine fossa (infraorbital, descending palatine, sphenopalatine, artery of pterygoid canal).



## QUESTION

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

**A** Subclavian triangle

CORRECT

**B** Submental triangle

**C** Digastric triangle

**D** Carotid triangle

## RIGHT ANSWER

OK

**A. Subclavian triangle**

## WHY THIS IS RIGHT

The anterior triangle of the neck is bounded by:

- Anterior border of sternocleidomastoid
- Midline of the neck
- Inferior border of mandible

It is subdivided into four smaller triangles:

1. Submental triangle
2. Digastric (submandibular) triangle
3. Carotid triangle
4. Muscular triangle

The subclavian triangle (also called the omoclavicular or supraclavicular triangle) is not part of the anterior triangle. It belongs to the posterior triangle of the neck.

## QUESTION

Which of the following branches of internal Carotid artery are given off in the cervical region?

- A Pharyngeal branches
- B Pterygoid branch
- C Caroticotympanic branch

**D None of the above**

CORRECT

## RIGHT ANSWER

**D. None of the above**

## WHY THIS IS RIGHT

The internal carotid artery (ICA) has no branches in the cervical region.

Course of the ICA:

1. Cervical part -> from common carotid bifurcation to carotid canal
  - o No branches
2. Petrous part -> gives caroticotympanic branches
3. Cavernous part -> gives cavernous branches
4. Cerebral part -> gives major intracranial branches such as:
  - o Ophthalmic artery
  - o Posterior communicating artery
  - o Anterior choroidal artery
  - o Anterior cerebral artery
  - o Middle cerebral artery

## QUESTION

| The Burn's space (suprasternal space) is located in which anatomical region?

- A** Between platysma and superficial fascia
- B** Between the two layers of the investing layer of deep cervical fascia **CORRECT**
- C** Between pretracheal and prevertebral fascia
- D** Within the carotid sheath

## RIGHT ANSWER

- OK** **B. Between the two layers of the investing layer of deep cervical fascia**

## WHY THIS IS RIGHT

Burns' space (suprasternal space) is a small potential space in the lower anterior neck.

- Situated between the two layers of the investing layer of deep cervical fascia
- Located just above the manubrium of the sternum, between the sternal heads of the sternocleidomastoid muscles

Contents:

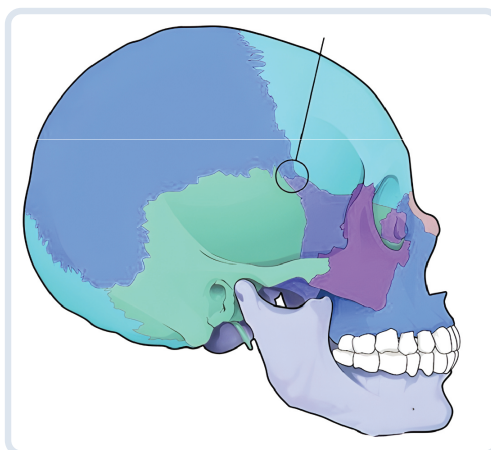
- Jugular venous arch
- Interclavicular ligament
- Occasionally fat and lymph nodes

Clinical relevance:

- Can act as a pathway for spread of infection in the anterior neck.
- Important surgical landmark during tracheostomy or neck dissections.

## QUESTION

Identify the incorrect statement regarding the marked structure:



CORRECT

**A** It is the meeting point of frontal, parietal, temporal and maxillary bones

**B** Stem of lateral sulcus lies underneath

**C** Middle meningeal artery lies under this structure

**D** It corresponds to site of anterolateral fontanelle of fetal skull

## RIGHT ANSWER

**OK** **A. It is the meeting point of frontal, parietal, temporal and maxillary bones**

## WHY THIS IS RIGHT

The marked point is the pterion, a clinically important H-shaped junction of sutures on the lateral aspect of the skull.

Four bones meet here:

- Frontal bone
- Parietal bone
- Greater wing of sphenoid
- Squamous part of temporal bone

Therefore, the statement that it is formed by frontal, parietal, temporal, and maxillary bones is incorrect.

Anatomical relations:

- Stem of the lateral sulcus (Sylvian fissure) lies deep to the pterion.
- The anterior branch of the middle meningeal artery runs beneath it.

Clinical importance:

- The pterion corresponds to the anterolateral (sphenoidal) fontanelle in the fetal skull.
- A fracture here can tear the middle meningeal artery, causing an epidural hematoma.

## QUESTION

During a submandibular surgical approach, after reflecting the mylohyoid muscle, a surgeon identifies the hyoglossus muscle. Two nerves are seen running superficial to hyoglossus, one lying closer to the oral mucosa (more superior) and the other lying closer to the hyoid bone (more inferior) before entering the tongue region. Which combination correctly identifies the two nerves based only on their anatomical position relative to hyoglossus?

- A** Superior - Hypoglossal nerve; Inferior - Lingual nerve
- B** Superior - Lingual nerve; Inferior - Hypoglossal nerve **CORRECT**
- C** Superior - Marginal mandibular nerve; Inferior - Lingual nerve
- D** Superior - Glossopharyngeal nerve; Inferior - Hypoglossal nerve

## RIGHT ANSWER

- B. Superior - Lingual nerve; Inferior - Hypoglossal nerve**

## WHY THIS IS RIGHT

The hyoglossus muscle is an important anatomical landmark in the floor of the mouth used to identify nearby nerves and vessels. Structures related to the hyoglossus muscle:

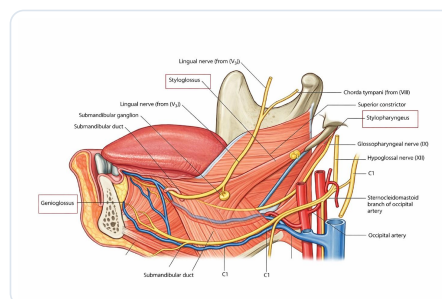
Superficial (lateral) to hyoglossus:

- Lingual nerve (more superior, closer to oral mucosa)
- Hypoglossal nerve (CN XII) (more inferior, closer to the hyoid bone)
- Submandibular duct

Deep (medial) to hyoglossus:

- Glossopharyngeal nerve (CN IX)
- Lingual artery

During submandibular gland or floor-of-mouth surgery, recognizing these relations helps avoid injury to the lingual and hypoglossal nerves, which could cause loss of tongue sensation or motor function.



## QUESTION

A medical student was yawning during his afternoon anatomy lecture. His jaw got arrested while yawning. Which muscle aids in relocation of the jaw?

A Lateral pterygoid

B Medial Pterygoid

C Masseter

D Temporalis

CORRECT

## RIGHT ANSWER

OK

**D. Temporalis**

## WHY THIS IS RIGHT

Excessive yawning can cause anterior dislocation of the temporomandibular joint (TMJ). In this condition, the mandibular condyle moves anterior to the articular tubercle of the temporal bone, and the mouth remains open.

The temporalis muscle is responsible for:

- Elevation of the mandible
- Retrusion (pulling the mandible backward)

During TMJ dislocation, retrusion of the mandible by the temporalis muscle helps move the mandibular condyle back into the mandibular fossa, aiding in relocation of the jaw.

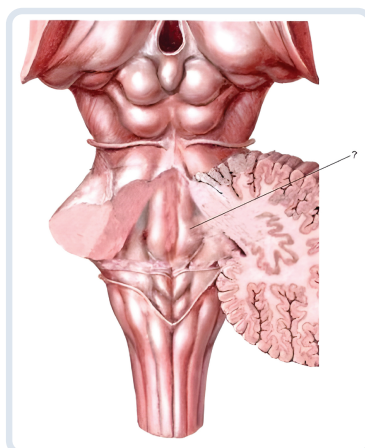
Comparison with other muscles:

- Lateral pterygoid -> protrudes and depresses mandible
- Medial pterygoid -> elevates mandible
- Masseter -> powerful elevator of mandible

Only temporalis significantly retracts the mandible, which is needed to reduce the dislocation.

## QUESTION

| Which structure is supplied by the nerve causing this elevation?



- A** Lateral rectus
- B** Anterior belly of digastric
- C** Posterior belly of digastric
- D** Levator palpebrae superioris

CORRECT

## RIGHT ANSWER

- OK** C. Posterior belly of digastric

## WHY THIS IS RIGHT

The image depicts elevation of the soft palate, an action primarily mediated by the vagus nerve (CN X) via the pharyngeal plexus (supplying levator veli palatini).

- Most palatal and pharyngeal muscles are supplied by the vagus nerve (CN X).
- Only tensor veli palatini is supplied by V3 (mandibular division of trigeminal nerve).'

Among the options, the muscle supplied by the vagus nerve is: Posterior belly of digastric

Other options:

- Lateral rectus -> Abducens nerve (CN VI)
- Anterior belly of digastric -> Mylohyoid nerve (V3)
- Levator palpebrae superioris -> Oculomotor nerve (CN III)

## QUESTION

An 8 year old child presents to the pediatric clinic with recurrent ear infections and complaints of ear pain, especially after upper respiratory infections. What is the most likely reason for this child's increased susceptibility to ear infections?

- A** The Eustachian tube's shorter length allows for quicker drainage of secretions from the middle ear.
- B** The more horizontal orientation of the Eustachian tube in children impairs proper ventilation and drainage of the middle ear. **CORRECT**
- C** The Eustachian tube opens more frequently during normal activities in children, causing increased exposure to environmental allergens.
- D** The Eustachian tube is typically narrow in children, which facilitates the entry of pathogens from the nasopharynx.

## RIGHT ANSWER

- OK** **B. The more horizontal orientation of the Eustachian tube in children impairs proper ventilation and drainage of the middle ear.**

## WHY THIS IS RIGHT

Children are more prone to otitis media because the Eustachian (pharyngotympanic) tube differs anatomically from that of adults.

In children, the Eustachian tube is:

- Shorter
- More horizontal
- Relatively wider

The more horizontal orientation makes ventilation and drainage of the middle ear less efficient and allows nasopharyngeal secretions and pathogens to reflux into the middle ear, especially during upper respiratory infections. This predisposes children to recurrent middle ear infections.



## QUESTION

Which of the following statements about the structures within the parotid gland are accurate?

1. The external carotid artery enters the parotid gland through the posteromedial surface.
2. The maxillary artery exits through the posterior surface of the gland.
3. The superficial temporal artery branches into the transverse facial artery and emerges from the anterior part of the superior surface.
4. The superficial temporal vein and maxillary vein unite to form the retromandibular vein, which divides into anterior and posterior divisions near the apex of the gland.
5. The facial nerve enters the parotid gland and passes behind the retromandibular vein.

**A** Only 1, 3 and 4

CORRECT

**B** Only 1 and 3

**C** All except 2

**D** All the above

## RIGHT ANSWER

**OK** A. Only 1, 3 and 4

## WHY THIS IS RIGHT

The parotid gland contains several important structures arranged from superficial to deep: Order of structures (lateral -> medial):

1. Facial nerve (CN VII)
2. Retromandibular vein
3. External carotid artery

Key anatomical facts:

- The external carotid artery enters the gland through its posteromedial surface and divides into maxillary and superficial temporal arteries within the gland.
- The superficial temporal artery gives off the transverse facial artery and emerges from the upper anterior part of the gland.
- The superficial temporal vein and maxillary vein unite to form the retromandibular vein, which divides into anterior and posterior divisions near the apex of the gland.

Incorrect statement: The facial nerve lies superficial to the retromandibular vein, not behind it.

## QUESTION

During surgery, the surgeon notices an additional thyroid vein, known as the Kocher's vein, which drains into the internal jugular vein. The surgeon carefully ligates this additional vein to avoid any postoperative complications. What is the most likely origin of this additional vein?

**A** Between the middle and inferior thyroid veins

CORRECT

**B** Between the superior and inferior thyroid veins

**C** Middle of the thyroid lobe

**D** Thyroid isthmus

## RIGHT ANSWER

OK

**A. Between the middle and inferior thyroid veins**

## WHY THIS IS RIGHT

The source quiz contains the placeholder "\$2" here and does not include a written explanation for this item.

## QUESTION

50-year-old patient experiences numbness in the area around the neck following a cervical block performed for neck surgery. Which of the following is not a branch of the cervical plexus?

- A Greater Auricular Nerve
- B Transverse Cutaneous Nerve of the Neck
- C Supraclavicular Nerve
- D Phrenic Nerve

CORRECT

## RIGHT ANSWER

- OK
- D. Phrenic Nerve

## WHY THIS IS RIGHT

The cervical plexus is formed by the anterior rami of spinal nerves C1-C4 and provides sensory and some motor innervation to the neck region.

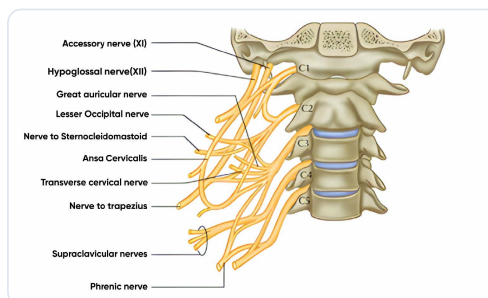
Cutaneous (sensory) branches of the cervical plexus:

- Lesser occipital nerve (C2)
- Greater auricular nerve (C2-C3)
- Transverse cervical (transverse cutaneous) nerve of neck (C2-C3)
- Supraclavicular nerves (C3-C4)

Motor branches include:

- Ansa cervicalis (C1-C3) -> infrahyoid muscles
- Phrenic nerve (C3-C5) -> diaphragm

Although the phrenic nerve originates mainly from C3-C5, it is considered a separate motor nerve rather than a typical branch supplying the neck region, making it the exception in this context.



## QUESTION

Which of the following sinuses is not located between the meningeal and endosteal layers of the dura mater?

A Superior sagittal sinus

B Transverse sinus

C **Straight sinus**

CORRECT

D Sigmoid sinus

## RIGHT ANSWER

OK C. Straight sinus

## WHY THIS IS RIGHT

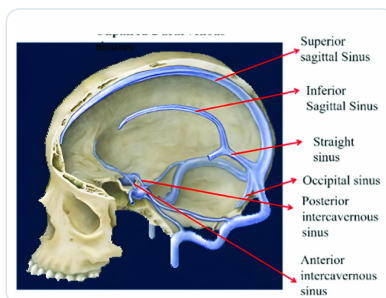
Most dural venous sinuses are located between the periosteal (endosteal) and meningeal layers of the dura mater and drain venous blood from the brain. Examples include:

- Superior sagittal sinus
- Transverse sinus
- Sigmoid sinus

However, the straight sinus is formed at the junction of the falx cerebri and tentorium cerebelli, where two folds of the meningeal layer meet, rather than between the meningeal and endosteal layers.

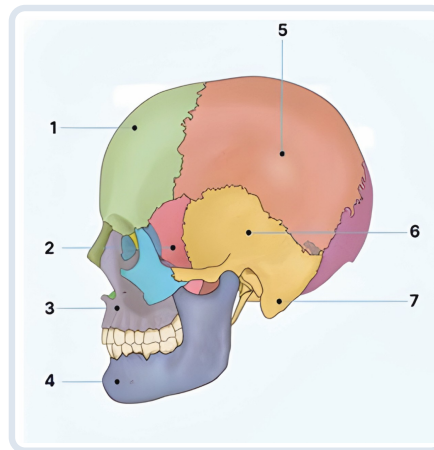
Formation of the straight sinus:

- Union of inferior sagittal sinus + great cerebral vein (vein of Galen).



## QUESTION

Which among the following are pneumatic bones?



A 1, 2, 3, 6, 7

CORRECT

B 1, 2, 3, 5, 7

C 1, 2, 4, 6

D 1, 3, 5, 6, 7

## RIGHT ANSWER

OK A. 1, 2, 3, 6, 7

## WHY THIS IS RIGHT

(1 - Frontal, 2 - Sphenoid, 3 - Maxilla, 4 - Mandible, 5 - Parietal, 6 - Temporal, 7 - Mastoid)

Pneumatic bones are bones that contain air-filled cavities (sinuses or air cells) lined by respiratory mucosa, which communicate with the nasal cavity. Functions of pneumatic bones:

- Reduce skull weight
- Resonate voice
- Warm and humidify inspired air
- Provide shock absorption

Examples of pneumatic bones of the skull:

- Frontal bone -> frontal sinus
- Sphenoid bone -> sphenoidal sinus
- Maxilla -> maxillary sinus
- Temporal bone -> mastoid air cells

Bones that are NOT pneumatic:

- Mandible
- Parietal bone

## QUESTION

| Which of the following muscle causes opening of laryngeal inlet?

- A Vocalis
- B Thyroepiglotticus**
- C Cricoarytenoid
- D Thyroarytenoid

CORRECT

## RIGHT ANSWER

- B. Thyroepiglotticus**

## WHY THIS IS RIGHT

The laryngeal inlet (aditus of the larynx) is the opening that connects the pharynx to the larynx. Its size is regulated by specific intrinsic laryngeal muscles that either widen or narrow the inlet during breathing and swallowing.

Muscle Responsible for Opening the Laryngeal Inlet: Thyroepiglotticus muscle

- It is an extension of the thyroarytenoid muscle.
- Action: Pulls the epiglottis anteriorly and upward, thereby widening (opening) the laryngeal inlet.
- Helps facilitate air passage during respiration.

Other Muscles:

- Vocalis -> Fine adjustment of vocal cord tension for phonation.
- Cricoarytenoid muscles -> Mainly control abduction or adduction of vocal cords, not the laryngeal inlet directly.
- Thyroarytenoid -> Relaxes vocal cords and narrows the laryngeal vestibule.

## QUESTION

A 40-year-old man with a history of tobacco chewing presented with a non-healing ulcer over the tip of the tongue. Biopsy revealed squamous cell carcinoma. Which of the following would be the sentinel lymph nodes?

A Submandibular lymph nodes

B Submental lymph nodes

CORRECT

C Deep cervical lymph nodes

D Jugulo-omohyoid lymph nodes

## RIGHT ANSWER

OK

B. Submental lymph nodes

## WHY THIS IS RIGHT

Lymphatic drainage of the tongue is region-specific, and the first lymph node group receiving lymph (sentinel node) is important in the spread of carcinoma of the tongue.

Lymphatic Drainage of Different Parts of Tongue:

A carcinoma located at the tip of the tongue will first drain to the submental lymph nodes, making them the sentinel lymph nodes.

| Part of Tongue       | Primary Lymph Node Drainage                            |
|----------------------|--------------------------------------------------------|
| Tip (apex)           | Submental lymph nodes                                  |
| Lateral anterior 2/3 | Submandibular lymph nodes                              |
| Central anterior 2/3 | Deep cervical lymph nodes (especially jugulo-omohyoid) |
| Posterior 1/3        | Upper deep cervical lymph nodes (jugulodigastric)      |

## QUESTION

Arrange the events in the development of the thyroid gland in the correct sequence:

1. Fusion with caudal pharyngeal complex.
2. Formation of pharyngeal arches
3. Thyroglossal duct formation
4. Tuberculum impar is formed

**A** 2, 4, 3, 1

CORRECT

**B** 1, 2, 3, 4

**C** 4, 3, 2, 1

**D** 3, 1, 2, 4

RIGHT ANSWER

**OK** A. 2, 4, 3, 1

## WHY THIS IS RIGHT

The thyroid gland develops from an endodermal thickening in the floor of the primitive pharynx near the foramen cecum of the tongue.

Correct developmental sequence:

1. Formation of pharyngeal arches
2. Formation of the tuberculum impar in the developing tongue
3. Thyroglossal duct formation as the thyroid primordium descends from the foramen cecum
4. Fusion with the caudal pharyngeal complex (ultimobranchial body contributing C cells)

Persistence of the thyroglossal duct can lead to thyroglossal duct cysts, typically located in the midline of the neck and moving with swallowing or tongue protrusion.



## QUESTION

A patient presents with a fish bone lodged in the pyriform fossa. During the removal procedure, a nerve located in this region is injured. Which of the following nerves is most likely involved?

A ELN

B ILN

CORRECT

C RLN

D IX

## RIGHT ANSWER

OK

B. ILN

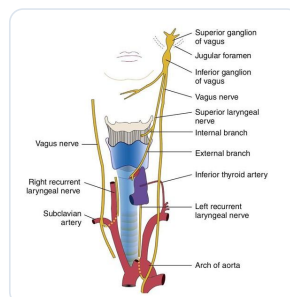
## WHY THIS IS RIGHT

The correct answer is Internal laryngeal nerve (ILN).

The pyriform fossa mucosa is supplied by the internal laryngeal nerve, a branch of the superior laryngeal nerve, providing sensory innervation above the vocal cords.

Injury here leads to loss of sensation and cough reflex, explaining the clinical relevance during foreign body removal.

The external laryngeal nerve is motor, RLN supplies structures below the vocal cords, and glossopharyngeal nerve supplies the oropharynx, not the pyriform fossa.



## QUESTION

A patient presents with swelling below the left earlobe and is experiencing pain. What is the most likely cause of this pain?

- A Facial nerve
- B Investing layer of deep cervical fascia
- C Auriculotemporal nerve

**D Greater auricular nerve**

CORRECT

## RIGHT ANSWER

**OK** D. Greater auricular nerve

## WHY THIS IS RIGHT

Swelling below the earlobe commonly involves the parotid region, where pain sensation is carried by the greater auricular nerve (C2-C3).

This nerve supplies the skin over the parotid gland, angle of mandible, and lower auricle.

Facial nerve is motor, auriculotemporal nerve carries secretomotor fibers and sensory supply to temple, and fascia itself is not a pain-transmitting structure.

## QUESTION

A student got his jaw locked while yawning. Identify the muscle attached to the articular disc of the temporomandibular joint?

**A** Lateral pterygoid

CORRECT

**B** Temporalis

**C** Medial pterygoid

**D** Masseter

## RIGHT ANSWER

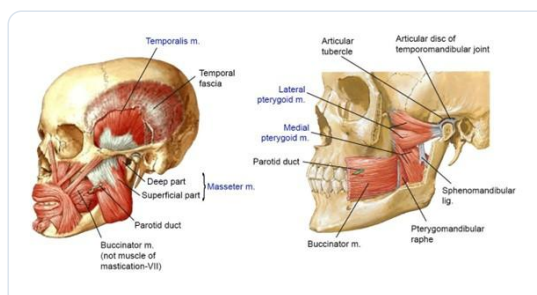
**OK** A. Lateral pterygoid

## WHY THIS IS RIGHT

The lateral pterygoid muscle inserts into the neck of mandible and the articular disc of the TMJ, controlling disc movement during mouth opening.

Excessive contraction during yawning can displace the disc, leading to jaw locking.

Temporalis, medial pterygoid, and masseter attach to the mandible but do not insert into the articular disc.



## QUESTION

**I Injury to which nerve results in absent gag reflex?**

**A** VII & X

**B** IX & X

CORRECT

**C** V & IX

**D** VII & IX

## RIGHT ANSWER

**OK** B. IX & X

## WHY THIS IS RIGHT

The afferent limb of the gag reflex is mediated by the glossopharyngeal nerve (CN IX) from the posterior pharynx. The efferent limb is carried by the vagus nerve (CN X) supplying the pharyngeal muscles. Injury to either nerve can abolish the gag reflex.

## QUESTION

| Paralysis of which muscle causes ptosis in Horner syndrome?

- A** Orbitalis
- B** Levator superioris palpebrae
- C** Orbicularis Oculi
- D** Superior tarsal muscle

CORRECT

## RIGHT ANSWER

- OK** **D. Superior tarsal muscle**

## WHY THIS IS RIGHT

Ptosis in Horner syndrome is due to paralysis of the superior tarsal (Müller's) muscle, which is a sympathetically innervated smooth muscle.

This causes mild ptosis, unlike complete ptosis from levator palpebrae superioris (CN III) palsy.

Orbicularis oculi closes the eyelid, and orbitalis has no role in eyelid elevation.

## QUESTION

During resection of the submandibular gland along with its duct, which of the following structure lying below the duct is most likely to be injured during the procedure?

A Marginal mandibular nerve

B Facial artery

C Hypoglossal nerve

CORRECT

D Trigeminal nerve

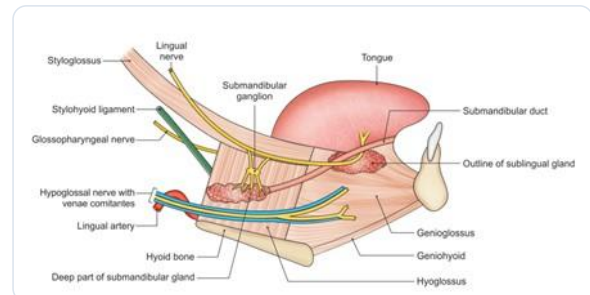
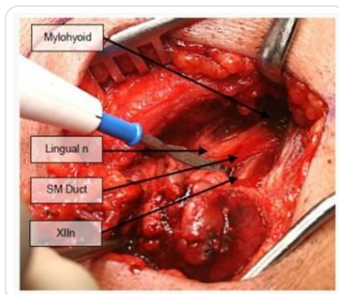
## RIGHT ANSWER

OK C. Hypoglossal nerve

## WHY THIS IS RIGHT

During submandibular gland resection with removal of the submandibular duct (Wharton's duct), the nerve most at risk below the duct is the hypoglossal nerve (CN XII).

During submandibular gland surgery, the hypoglossal nerve (CN XII) runs below and deep to the submandibular duct (on the hyoglossus muscle) and is at risk of injury during deep dissection. The lingual nerve has a characteristic lateral-below-medial (LBM) relationship with the duct and is also at risk. Injury to the hypoglossal nerve results in ipsilateral tongue paralysis with deviation toward the side of the lesion.



## QUESTION

| Blood supply for the red shaded area in the given image is a branch of which artery?



A Superior cerebellar artery

B Posterior cerebral artery

C Vertebral artery

CORRECT

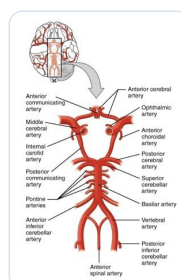
D Basilar artery

## RIGHT ANSWER

OK C. Vertebral artery

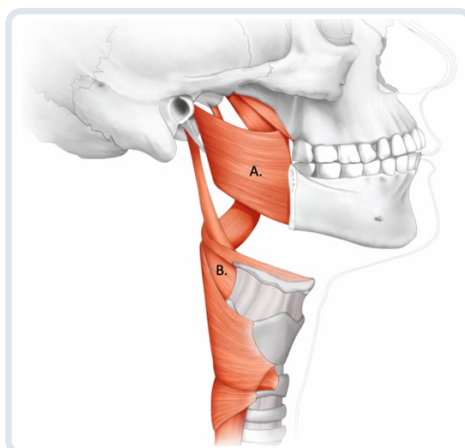
## WHY THIS IS RIGHT

The red shaded area represents the lateral medulla, which is supplied by the posterior inferior cerebellar artery (PICA). PICA is a branch of the vertebral artery and its occlusion causes lateral medullary (Wallenberg) syndrome. Superior cerebellar artery arises from basilar artery, posterior cerebral artery supplies midbrain and occipital lobe, and basilar artery itself does not directly supply this lateral medullary region.



## QUESTION

Identify the structure passing between marked points A and B



A Palatopharyngeus

B Stylopharyngeus

CORRECT

C Stylohyoid

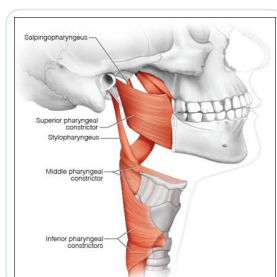
D Mylohyoid

## RIGHT ANSWER

OK B. Stylopharyngeus

## WHY THIS IS RIGHT

The stylopharyngeus muscle passes between the superior and middle pharyngeal constrictors, and it is innervated by the glossopharyngeal nerve (cranial nerve IX).



| Gap                                                                                            | Structures Passing Through                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Between the base of skull and upper concave border of superior constrictor (sinus of Morgagni) | <ul style="list-style-type: none"> <li>Auditory tube</li> <li>Levator palatini muscle</li> <li>Ascending palatine artery</li> <li>Palatine branch of ascending pharyngeal artery</li> </ul> |
| Between the superior and middle constrictors                                                   | <ul style="list-style-type: none"> <li>Stylopharyngeus muscle</li> <li>Glossopharyngeal nerve</li> </ul>                                                                                    |
| Between the middle and inferior constrictors                                                   | <ul style="list-style-type: none"> <li>Internal laryngeal nerve</li> <li>Superior laryngeal vessels</li> </ul>                                                                              |
| Between the lower border of inferior constrictor and oesophagus (in tracheoesophageal groove)  | <ul style="list-style-type: none"> <li>Recurrent laryngeal nerve</li> <li>Inferior laryngeal vessels</li> </ul>                                                                             |



## QUESTION

After parotidectomy, lower lip paralysis was seen in a patient. Which of the following part of facial nerve was involved?

- A Parotid duct
- B Temporal branch of facial nerve
- C Cervical branch of facial nerve**
- D Main trunk of facial nerve

CORRECT

## RIGHT ANSWER

- OK
- C. Cervical branch of facial nerve**

## WHY THIS IS RIGHT

The cervical branch of the facial nerve is responsible for innervating the platysma muscle, which is crucial for controlling lower lip movements. During a parotidectomy, if this branch is damaged, it can lead to paralysis of the lower lip.

## QUESTION

A patient not able to chew the food and food stuck between cheeks and teeth. Which muscle weakness is associated with this clinical condition?

**A** Buccinator

CORRECT

**B** Orbicularis oris

**C** Zygomaticus major

**D** Levator labi superioris

RIGHT ANSWER

**OK** A. Buccinator

## WHY THIS IS RIGHT

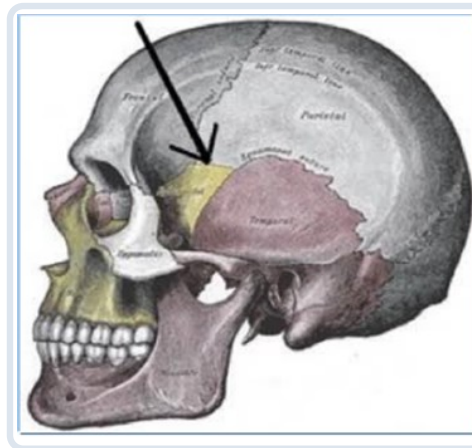
The correct answer is Buccinator.

Buccinator compresses the cheek against the teeth, preventing food from accumulating in the vestibule during mastication.

Weakness leads to food getting trapped between cheek and teeth, a classic sign seen in facial nerve palsy.

## QUESTION

**Structure which is related deep to marked structure?**



**A Stem of lateral sulcus**

CORRECT

B ICA Siphon

C Wernicke's area

D Pineal gland

## RIGHT ANSWER

OK

**A. Stem of lateral sulcus**

## WHY THIS IS RIGHT

The correct answer is Stem of the lateral sulcus.

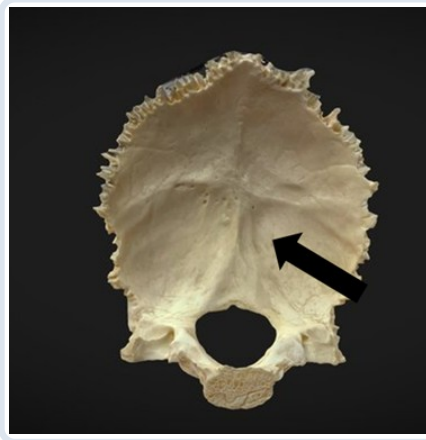
Pterion (junction of frontal, parietal, sphenoid, temporal bones) overlies the anterior branch of the middle meningeal artery and corresponds deep to the stem of the lateral (Sylvian) sulcus.

Structures deep to the pterion (from outside -> inside):

- i. Anterior branch of middle meningeal artery
  - ii. Dura mater
  - iii. Subdural space
  - iv. Arachnoid mater
  - v. Subarachnoid space with CSF
  - vi. Stem of the lateral (Sylvian) sulcus
- Insular cortex (deepest cortical structure)

## QUESTION

Pain originating from the marked structure is typically referred to which of the following locations?



A Ear

B Back of neck

CORRECT

C Vertex

D Shoulder

RIGHT ANSWER

OK

B. Back of neck

## WHY THIS IS RIGHT

The marked structure lies in the posterior cranial fossa near the occipital bone/venous sinuses, whose dura is supplied by upper cervical nerves (C2-C3).

Pain from this region is therefore referred to the occipital region and back of the neck.

## QUESTION

A woman develops choking, hoarseness of voice, and a foreign body sensation in the throat while eating fish. Examination reveals a fish bone lodged in the pyriform fossa. Which nerve is primarily responsible for mediating this irritation?

A IX

B RLN

C Internal branch of SLN

CORRECT

D External branch of SLN

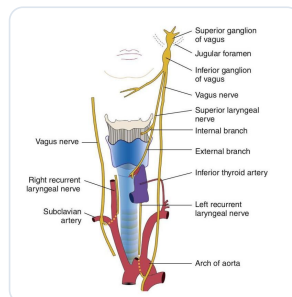
## RIGHT ANSWER

OK

C. Internal branch of SLN

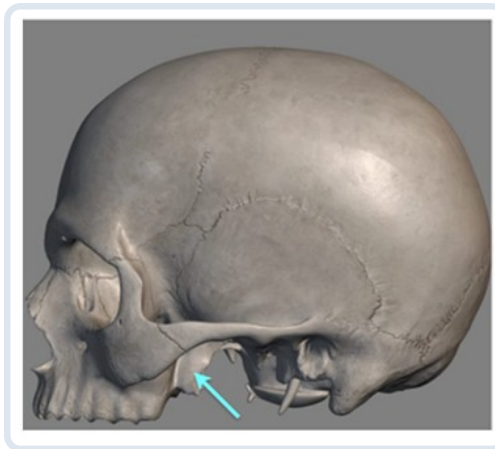
## WHY THIS IS RIGHT

The correct answer is Internal branch of the superior laryngeal nerve (SLN). The pyriform fossa mucosa is supplied by the internal laryngeal nerve, which carries sensory fibres above the vocal cords. Irritation here causes foreign body sensation, choking, and cough reflex. Glossopharyngeal nerve supplies oropharynx, while RLN and external SLN are motor and do not mediate this sensory irritation.



## QUESTION

What is the primary function of the muscle attached at the marked point in the given image?



- A Elevation
- B Depression
- C Retraction
- D Rotation

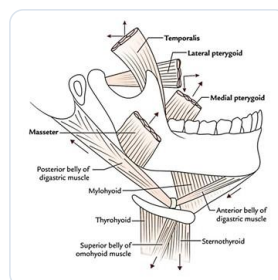
CORRECT

RIGHT ANSWER

OK B. Depression

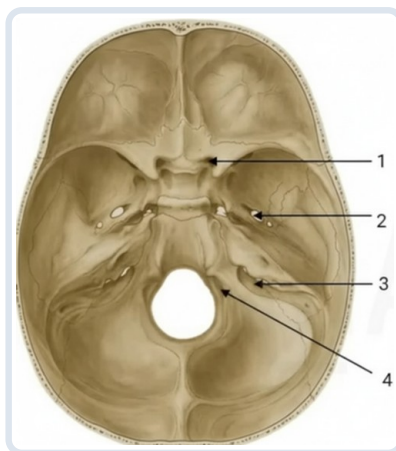
## WHY THIS IS RIGHT

The marked point in the image indicates the lateral pterygoid plate of the sphenoid bone. The muscle attached to the lateral surface of the lateral pterygoid plate is the lateral pterygoid muscle.



## QUESTION

Through which of the following foramen does the nerve supplying the muscle of mastication pass?



A 1

B 2

CORRECT

C 3

D 4

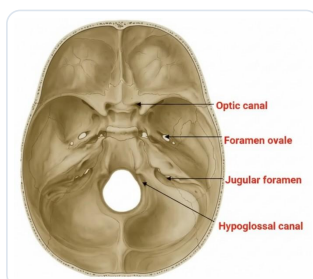
RIGHT ANSWER

OK

B. 2

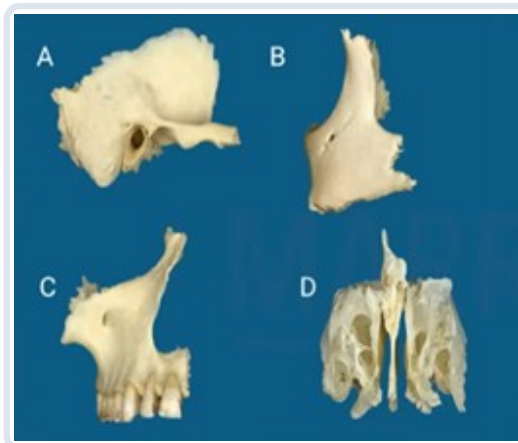
## WHY THIS IS RIGHT

The muscles of mastication are supplied by the mandibular nerve (V3), it is the only motor division of the trigeminal nerve. V3 exits the cranial cavity through the foramen ovale to enter the infratemporal fossa. Optic canal transmits CN II, jugular foramen transmits CN IX-XI, and hypoglossal canal transmits CN XII, none of which supply muscles of mastication.



## QUESTION

Which of the following bone contains the cranial nerve related directly to CNS?



A A

B B

C C

D D

CORRECT

RIGHT ANSWER

OK D. D

## WHY THIS IS RIGHT

The correct answer is D (Ethmoid bone).

The ethmoid bone contains the cribriform plate, which is perforated by multiple foramina transmitting the olfactory nerve filaments (cranial nerve I) from the nasal mucosa to the olfactory bulb.

The olfactory bulb and tract are outgrowths of the forebrain (telencephalon), making CN I the only cranial nerve directly connected to the CNS without an intervening peripheral ganglion.

Cranial nerves directly related to CNS:

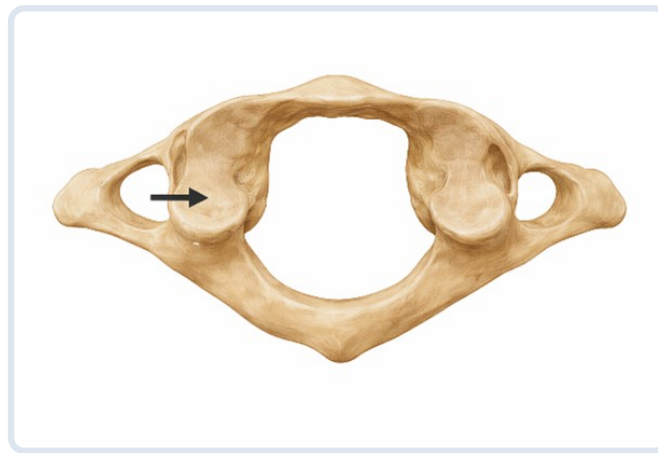
- CN I -> through cribriform plate (Ethmoid)
- CN II -> through optic canal (Sphenoid)

In contrast, the temporal bone (A) transmits CN VII and VIII, the zygomatic bone (B) transmits branches of CN V2, and the maxilla (C) transmits branches of CN V2-none of which have direct CNS continuity.



## QUESTION

Identify the structure that the marked structure in the given image of atlas vertebra articulates with.



**A** Occipital

CORRECT

**B** Sacrum

**C** Axis

**D** Sphenoid

RIGHT ANSWER

OK

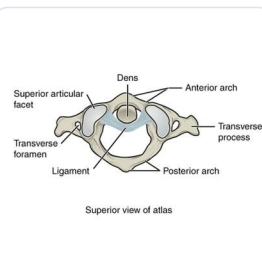
**A. Occipital**

## WHY THIS IS RIGHT

The marked structure is the superior articular facet of the atlas (C1).

Atlas had large vertebral foramen, kidney-shaped superior articular facets, concave, and articulates with the occipital condyles to form the atlanto-occipital joint.

This joint permit flexion-extension movements of the head ("yes" nodding movement).



## QUESTION

The blood oxygen saturations measured from different fetal vessel samples are 71%, 64%, 62%, 55%, and 43%. The sample with the greatest oxygen saturation was most likely obtained from which of the following blood vessels?

A Descending aorta

B Ductus arteriosus

C Inferior vena cava

CORRECT

D Pulmonary trunk

## RIGHT ANSWER

OK C. Inferior vena cava

## WHY THIS IS RIGHT

In fetal circulation, the highest oxygen saturation is found in blood returning from the placenta through the umbilical vein. After passing through the ductus venosus, this relatively well-oxygenated blood enters the inferior vena cava (IVC) before reaching the right atrium.

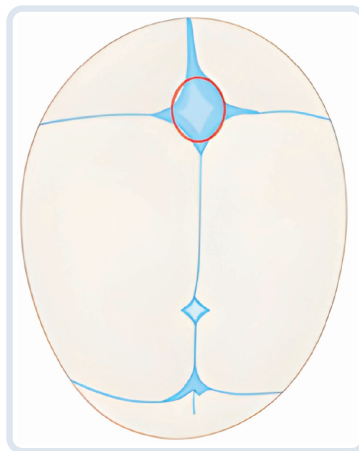
Approximate descending order of oxygen saturation:

1. Umbilical vein -> highest (~80%)
2. Inferior vena cava -> ~65-70% (mixture of oxygenated placental blood and systemic venous blood)
3. Right atrium / left atrium mixture
4. Pulmonary trunk / ductus arteriosus
5. Descending aorta -> lower due to mixing with deoxygenated blood

The IVC carries blood from the ductus venosus that bypassed the fetal liver, so it contains the most oxygenated blood among the listed options.

## QUESTION

A 6-month-old boy was brought to the casualty with seizures. The pediatrician tries to do CSF sampling. What are the structures punctured by the pediatrician while piercing through the marked structure?



**A** Scalp, dura, arachnoid

CORRECT

**B** Scalp, epicranium, endocranium and dura

**C** Scalp, synchondral membrane, dura, arachnoid

**D** Pericranium, dura, arachnoid

## RIGHT ANSWER

OK

**A. Scalp, dura, arachnoid**

## WHY THIS IS RIGHT

In infants, CSF can be obtained through the anterior fontanelle because the skull bones have not yet fused. The anterior fontanelle lies at the junction of the sagittal and coronal sutures and forms a diamond-shaped soft area on the top of the skull.

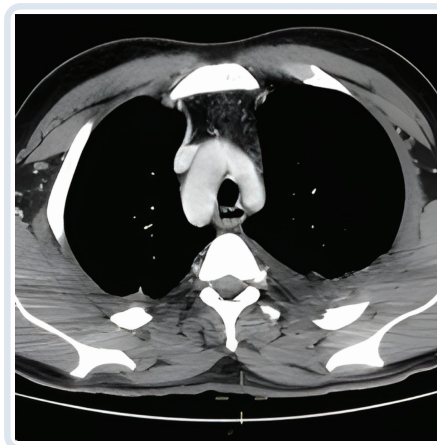
During puncture through the anterior fontanelle, the needle passes through the following layers:

1. Scalp
2. Dura mater
3. Arachnoid mater
4. Enters the subarachnoid space containing CSF

The skull bones and periosteum are absent at the fontanelle, which allows direct access to the meninges.

## QUESTION

The given condition is due to persistence of which of the following embryonic vessel?



CORRECT

**A** Persistence of right dorsal aorta

**B** Persistence of left 4th arch artery

**C** Persistence of left dorsal aorta

**D** Persistence of left 6th arch artery

## RIGHT ANSWER

OK

**A. Persistence of right dorsal aorta**

## WHY THIS IS RIGHT

A right-sided aortic arch occurs due to persistence of the right dorsal aorta with regression of the left dorsal aorta during embryologic development.

## Normal embryology

- The left 4th aortic arch + left dorsal aorta normally form the adult aortic arch.
- The right dorsal aorta normally regresses.

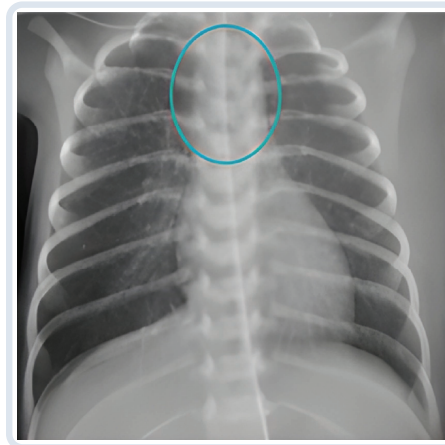
## Abnormal development

If the right dorsal aorta persists, the aortic arch develops on the right side, producing a right-sided aortic arch. This anomaly may form a vascular ring around the trachea and esophagus, which can cause:

- Dysphagia (difficulty swallowing)
- Respiratory symptoms due to airway compression.

## QUESTION

A 1-week-old boy is brought to the emergency department with poor feeding, lethargy, and unusual "muscle movements" involving the left thumb and hand over the last 2 days. The infant's vital signs are normal, but unusual flexion of the left wrist and thumb and extension of the fingers are observed with cuff blood pressure measurement. Physical examination reveals hypoplastic mandible, low-set ears, bifid uvula, and cleft palate. A chest x-ray is shown below. These findings most likely suggest impaired development of which of the following embryonic structures?



**A** Third pharyngeal pouch

CORRECT

**B** Foramen cecum

**C** Rathke pouch

**D** Second pharyngeal cleft

## RIGHT ANSWER

**OK** A. Third pharyngeal pouch

## WHY THIS IS RIGHT

This infant has features suggestive of DiGeorge syndrome (22q11 deletion), characterized by craniofacial abnormalities, thymic aplasia, and hypocalcemia due to parathyroid hypoplasia. These abnormalities occur due to impaired development of the third pharyngeal pouch.

The third pharyngeal pouch gives rise to:

- Thymus
- Inferior parathyroid glands

Failure of its development results in:

- Absent thymus -> T-cell immunodeficiency
- Hypocalcemia -> tetany or abnormal muscle movements
- Absent thymic shadow on chest X-ray

## QUESTION

A 2-week-old boy is brought to the clinic by his parents for evaluation of his umbilicus. The parents report that since the umbilical cord stump separated 2 days ago, there has been serous pale drainage from the umbilicus that increases when the patient cries. He is exclusively breastfed and continues to have normal wet diapers and stool output.

Laboratory results are as follows:

Hemoglobin: 14 g/dL

Platelets: 240,000/mm<sup>3</sup>

TLC: 11,000/mm<sup>3</sup>

Neutrophils: 60%

Lymphocytes: 32%

Which of the following is the most likely cause of this patient's umbilical findings?

- A Absence of neutrophil migration
- B Incomplete closure of anterior abdominal wall
- C Patency of omphalomesenteric duct

**D Persistence of allantois remnant**

CORRECT

## RIGHT ANSWER

**OK** D. Persistence of allantois remnant

## WHY THIS IS RIGHT

Persistent serous fluid discharge from the umbilicus that increases with crying in a neonate suggests a patent urachus, which occurs due to persistence of the allantois remnant.

- The allantois connects the developing bladder to the umbilicus during fetal life.
- Normally it obliterates after birth and forms the urachus -> median umbilical ligament.
- Failure of obliteration leads to urachal anomalies, most importantly patent urachus.

Clinical clue:

- Urine-like serous discharge from the umbilicus
- Discharge increases with crying or abdominal pressure
- Normal stool and urine output otherwise

Types of urachal anomalies:

1. Patent urachus - complete connection between bladder and umbilicus (urine leaks from umbilicus)
2. Urachal cyst
3. Umbilical urachal sinus
4. Vesicourachal diverticulum

## QUESTION

A 22-year-old man comes to the OPD due to occasional dull headaches that awaken him from sleep. The patient has no associated neurologic deficits. On physical examination, there are several 3- to 5-cm flat, pigmented spots on his trunk. There are also multiple, subcentimeter, soft, fleshy, cutaneous tumors located on his trunk and neck. The predominant cells forming these tumors most likely originated from which of the following structures?



A Endoderm

B Mesoderm

C Neural crest

CORRECT

D Neural tube

## RIGHT ANSWER

OK C. Neural crest

## WHY THIS IS RIGHT

This patient has features of Neurofibromatosis type 1 (NF1), characterized by multiple café-au-lait macules and numerous soft cutaneous neurofibromas. These tumors arise primarily from Schwann cells, which are derived from the neural crest during embryologic development.

- Neural crest cells give rise to several structures including:
  - o Schwann cells
  - o Melanocytes
  - o Peripheral nervous system ganglia
  - o Adrenal medulla
  - o Parts of craniofacial bones

Because neurofibromas originate from Schwann cells of peripheral nerves, their embryologic origin is neural crest.

## QUESTION

1-year-old boy is brought to the clinic for mass in the neck. The parents noticed a small area of nontender swelling in the neck a month ago. Over the last few days, it has enlarged and become painful, and the patient has a fever. Examination shows a mobile, tender, fluctuant, and warm mass approximately 2 cm in diameter that is located at the right mandibular angle. There is purulent drainage from the skin surface just anterior to the right sternocleidomastoid muscle. This patient's clinical findings are most likely due to which of the following embryologic processes?

- A** Failed descent of a pharyngeal pouch structure
- B** Failed neural crest migration into a pharyngeal arch
- C** Inadequate fusion of the mandibular prominences
- D** Incomplete obliteration of a pharyngeal groove

CORRECT

## RIGHT ANSWER

- OK** **D. Incomplete obliteration of a pharyngeal groove**

## WHY THIS IS RIGHT

A branchial cleft (pharyngeal groove) cyst or fistula occurs due to failure of obliteration of the second pharyngeal cleft during embryologic development. These lesions commonly present in children or young adults as a lateral neck swelling along the anterior border of the sternocleidomastoid muscle. Typical features:

- Located anterior to the sternocleidomastoid muscle
- Mobile, fluctuant neck mass
- May become painful, infected, and drain purulent material
- Often appears near the mandibular angle

Normally, the second pharyngeal arch overgrows the third and fourth arches, forming the cervical sinus, which later obliterates.

Failure of this obliteration leads to branchial cleft cysts, sinuses, or fistulas.



## QUESTION

| Which of the following brainstem nuclei is not derived from the alar plate?

- A Inferior olivary
- B Substantia nigra
- C Dentate
- D Hypoglossal**

CORRECT

## RIGHT ANSWER

- OK D. Hypoglossal**

## WHY THIS IS RIGHT

During embryonic development of the neural tube, the sulcus limitans divides it into:

- Alar plate (dorsal) -> gives rise to sensory nuclei
- Basal plate (ventral) -> gives rise to motor nuclei

Brainstem nuclei derived from the alar plate (sensory):

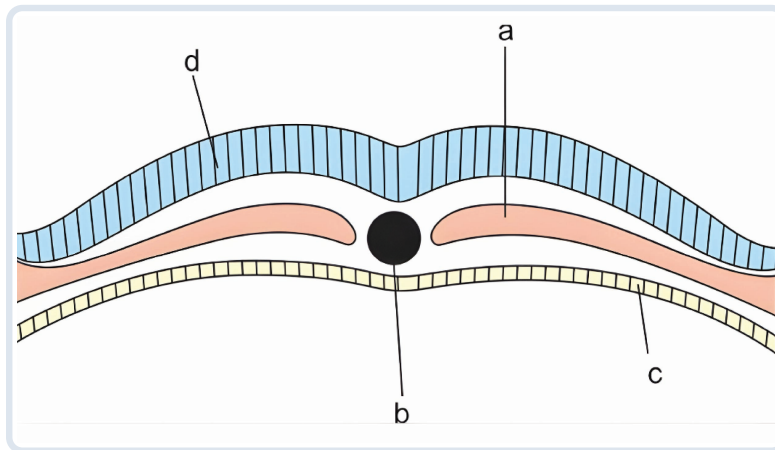
- Inferior olivary nucleus
- Dentate nucleus
- Many other sensory relay nuclei

Hypoglossal nucleus:

- A motor nucleus of cranial nerve XII
- Derived from the basal plate, not the alar plate

## QUESTION

Which of the following represents the origin of craniopharyngioma?



A A

B B

C C

D D

CORRECT

RIGHT ANSWER

OK D. D

## WHY THIS IS RIGHT

The source quiz contains the placeholder "\$2" here and does not include a written explanation for this item.

## QUESTION

A 50-year-old woman presents to the clinic with symptoms of urinary incontinence. She reports a sensation of urgency followed by involuntary loss of urine. Her medical history is significant for type 2 diabetes mellitus and hypertension. Upon further evaluation, you consider the role of the detrusor muscle in her condition. In understanding the embryological origins of muscles, which of the following muscles is not derived from the paraxial mesoderm?

A Genioglossus

B Superior oblique

C Biceps

D Detrusor

CORRECT

RIGHT ANSWER

OK

D. Detrusor

## WHY THIS IS RIGHT

Muscles of the body develop from different embryological mesodermal sources. Most skeletal muscles arise from the paraxial mesoderm (somites), whereas smooth muscle of viscera develops from splanchnic (visceral) mesoderm of the lateral plate.

Paraxial mesoderm forms somites, which differentiate into myotomes that give rise to skeletal muscles. Examples in the options:

- Genioglossus -> skeletal muscle of tongue (derived from occipital somites)
- Superior oblique -> extra-ocular skeletal muscle
- Biceps brachii -> skeletal muscle of upper limb

All are skeletal muscles derived from paraxial mesoderm.

Exception:

- Detrusor muscle -> smooth muscle of the urinary bladder wall
- Derived from splanchnic (visceral) mesoderm of lateral plate mesoderm, not paraxial mesoderm.

## QUESTION

A neonate has isolated paralysis of a single tongue muscle, yet the hypoglossal nerve conduction study is completely normal. Swallowing is mildly affected and gag reflex is slightly diminished. MRI shows a small developmental defect in the muscle located at the junction of the palate and tongue. All remaining intrinsic and extrinsic tongue muscles appear normal. Which embryological structure most likely failed to develop properly?

- A** Occipital myotomes derived from paraxial mesoderm
- B** First pharyngeal arch mesoderm
- C** Fourth pharyngeal arch mesoderm
- D** Neural crest mesenchyme surrounding the stomodeum

CORRECT

## RIGHT ANSWER

- OK** C. Fourth pharyngeal arch mesoderm

## WHY THIS IS RIGHT

Most tongue muscles (intrinsic and extrinsic) develop from occipital myotomes derived from paraxial mesoderm and are innervated by the hypoglossal nerve (CN XII). However, the palatoglossus muscle is an exception.

Palatoglossus:

- Located at the junction of the soft palate and tongue
- Derived from the 4th pharyngeal arch mesoderm
- Innervated by the vagus nerve (CN X) via the pharyngeal plexus, not the hypoglossal nerve

Clinical implication:

- A developmental defect affecting the 4th pharyngeal arch can cause isolated palatoglossus dysfunction with normal hypoglossal nerve conduction.
- This may cause mild swallowing difficulty and slight gag reflex changes.

## QUESTION

If the development of the endoderm is negatively affected and fails to normally differentiate, which of the following glands would not be affected by this?

- A Follicular cells of thyroid
- B Parenchyma of parathyroid glands
- C Anterior pituitary**
- D Pancreas

CORRECT

## RIGHT ANSWER

- OK
- C. Anterior pituitary**

## WHY THIS IS RIGHT

During embryonic development, many endocrine glands arise from the endoderm, particularly from the pharyngeal pouch endoderm and foregut endoderm.

Endoderm-derived glands:

- Follicular cells of the thyroid -> derived from endoderm of the primitive pharynx.
- Parathyroid glands -> develop from 3rd and 4th pharyngeal pouch endoderm.
- Pancreas -> develops from foregut endoderm (dorsal and ventral pancreatic buds).

Exception:

- The anterior pituitary (adenohypophysis) develops from oral ectoderm (Rathke's pouch), not from endoderm. Therefore, endodermal developmental defects would not affect the anterior pituitary.

## QUESTION

Which of the following correctly describes the role of Sertoli cells during spermatogenesis?

- A** They induce spermatogonial stem cells to initiate spermatogenesis.
- B** They stimulate Leydig cells to produce testosterone.
- C** They secrete androgen-binding proteins and support germ cells. CORRECT
- D** They transform type A spermatogonia into spermatids.

## RIGHT ANSWER

- OK** **C. They secrete androgen-binding proteins and support germ cells.**

## WHY THIS IS RIGHT

Sertoli cells are supporting cells of the seminiferous tubules that play a crucial role in spermatogenesis. Key functions:

- Provide structural and nutritional support to developing germ cells.
- Secrete androgen-binding protein (ABP), which maintains high testosterone concentration in seminiferous tubules necessary for sperm development.
- Form the blood-testis barrier through tight junctions.
- Secrete inhibin, which regulates FSH secretion.
- Phagocytose residual cytoplasm during spermiogenesis.

Hormonal control:

- FSH stimulates Sertoli cells, while Leydig cells (stimulated by LH) produce testosterone.

## QUESTION

A newborn presents with bilious vomiting and abdominal distension. An abdominal X-ray shows signs of bowel obstruction. Intraoperatively, the surgeon finds multiple fibrous bands with the cecum on the left side and the small intestine on the right side. What is the most likely underlying anomaly?

A

Nonrotation of the midgut

CORRECT

B

Reversed rotation of the midgut

C

Incomplete midgut rotation

D

Midgut volvulus with normal rotation

## RIGHT ANSWER

OK

A. Nonrotation of the midgut

## WHY THIS IS RIGHT

During embryonic development, the midgut normally rotates 270° counterclockwise around the superior mesenteric artery (SMA) before returning to the abdominal cavity.

Nonrotation of the midgut:

- Occurs when this normal rotation fails to occur.
- As a result:

- o Small intestine lies predominantly on the right side
- o Colon (including cecum) lies on the left side

Clinical features:

- Bilious vomiting
- Abdominal distension
- Intestinal obstruction
- Presence of fibrous peritoneal bands (Ladd bands) that may compress the duodenum.

Other conditions:

- Incomplete rotation (malrotation): predisposes to midgut volvulus.
- Reversed rotation: colon lies posterior to the SMA.

## QUESTION

**Persistent left superior vena cava is due to failure of regression of:**

**A** Right anterior cardinal vein

**B** Left anterior cardinal vein

CORRECT

**C** Left posterior cardinal vein

**D** Right supracardinal vein

## RIGHT ANSWER

**OK** B. Left anterior cardinal vein

## WHY THIS IS RIGHT

During embryological development of the venous system, the anterior cardinal veins drain blood from the cranial part of the embryo. Normal development:

- The right anterior cardinal vein and right common cardinal vein form the superior vena cava (SVC).
- The left anterior cardinal vein normally regresses, leaving the ligament of Marshall and contributing to the coronary sinus.

Persistent left superior vena cava (PLSVC):

- Occurs when the left anterior cardinal vein fails to regress.
- The persistent vessel usually drains into the coronary sinus, which empties into the right atrium.
- Often asymptomatic and discovered incidentally.
- Important during central venous catheterization, pacemaker placement, or cardiac surgery.



## QUESTION

Which statement correctly describes the representation of body parts in the motor and sensory homunculi?

- A In the motor homunculus, finer motor control areas like arms and legs have larger cortical regions.
- B The sensory homunculus shows body parts with higher acuity, like fingertips, having smaller cortical areas.
- C Both homunculi are in the precentral gyrus and represent the same body parts.

**D The motor homunculus in the precentral gyrus has larger areas for fine motor parts like hands and face.** CORRECT

## RIGHT ANSWER

**OK D. The motor homunculus in the precentral gyrus has larger areas for fine motor parts like hands and face.**

## WHY THIS IS RIGHT

The motor homunculus represents the somatotopic organization of the primary motor cortex located in the precentral gyrus.

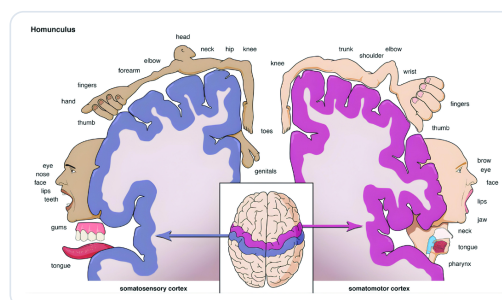
- The size of cortical representation depends on the precision of control, not the physical size of the body part.
- Body parts requiring fine motor control (e.g., hands, fingers, face, tongue) occupy larger cortical areas.

Sensory homunculus:

- Located in the postcentral gyrus (primary somatosensory cortex).
- Highly sensitive areas such as lips, tongue, and fingertips have larger cortical representation.

Why other options are incorrect:

- Arms and legs do not have the largest motor representation-hands and face do.
- High sensory acuity areas have larger, not smaller, cortical areas.
- Motor and sensory homunculi are in different gyri (precentral vs postcentral).



## QUESTION

During early embryonic development, the neural tube differentiates into primary and secondary brain vesicles, which later give rise to specific adult brain structures and ventricular components. Which of the following vesicle-derivative-ventricle combinations is correct?

- A Telencephalon -> Thalamus -> Third ventricle
- B Diencephalon -> Cerebral hemispheres -> Lateral ventricles
- C Mesencephalon -> Midbrain -> Cerebral aqueduct**
- D Myelencephalon -> Pons -> Fourth ventricle

CORRECT

## RIGHT ANSWER

- OK
- C. Mesencephalon -> Midbrain -> Cerebral aqueduct**

## WHY THIS IS RIGHT

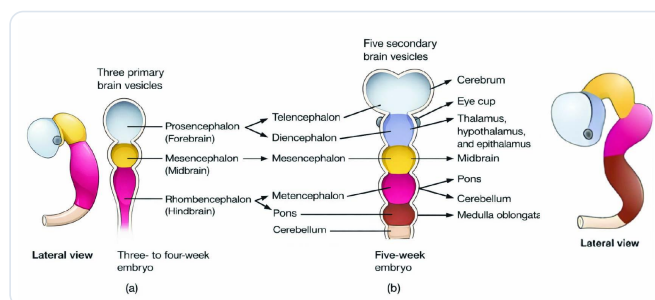
During early embryonic brain development, the neural tube forms primary brain vesicles, which later divide into secondary brain vesicles. Each vesicle gives rise to specific adult brain structures and ventricular cavities.

Correct relationship:

- Mesencephalon -> Midbrain -> Cerebral aqueduct

Why others are incorrect:

- A. Telencephalon -> Thalamus: Thalamus comes from diencephalon.
- B. Diencephalon -> Cerebral hemispheres: Hemispheres come from telencephalon.
- D. Myelencephalon -> Pons: Pons develops from metencephalon.



## QUESTION

What mechanism occurs within the zona pellucida of an oocyte to prevent the entry of multiple sperm cells after the initial fertilization?

- A Acrosomal reaction
- B Increased membrane potential of the oocyte
- C Cortical reaction
- D Decreased membrane potential of the oocyte

CORRECT

## RIGHT ANSWER

- OK C. Cortical reaction

## WHY THIS IS RIGHT

After the first sperm fertilizes the oocyte, mechanisms are activated to prevent polyspermy (entry of multiple sperm).

The cortical reaction is the main mechanism in humans:

- Fertilization triggers  $\text{Ca}^{2+}$  release inside the oocyte.
- Cortical granules beneath the oocyte membrane release enzymes into the zona pellucida.
- These enzymes modify the zona pellucida (zona reaction) and inactivate sperm-binding receptors (ZP3).
- This prevents additional sperm from binding or penetrating the oocyte.

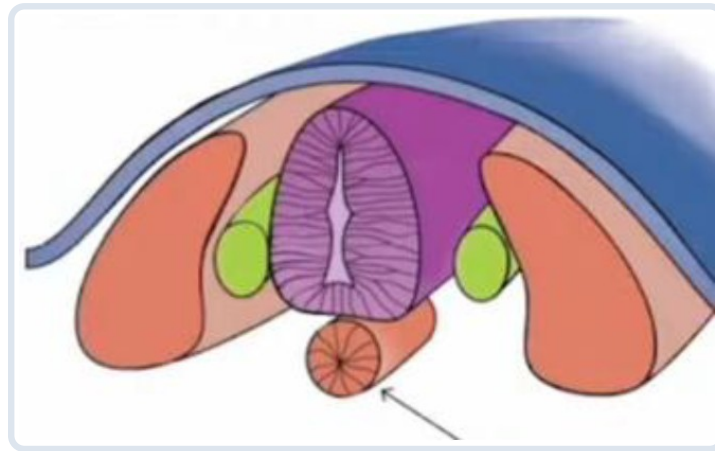
Other options:

A. Acrosomal reaction: occurs in the sperm before fertilization to penetrate the zona pellucida.

B. and D. Membrane potential changes: important in some species but not the primary block in humans.

## QUESTION

The marked embryonic structure in the image eventually gives rise to which of the following adult structure?



- A Vertebra
- B Spinal cord
- C Nucleus pulposus of intervertebral disc**
- D Annulus fibrosus of intervertebral disc

CORRECT

## RIGHT ANSWER

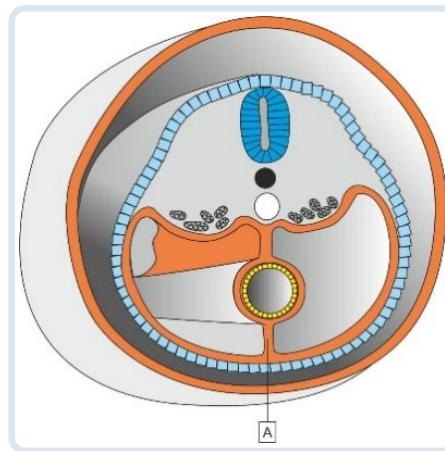
- OK
- C. Nucleus pulposus of intervertebral disc**

## WHY THIS IS RIGHT

The marked embryonic structure is the notochord, which persists in the adult as the nucleus pulposus. The annulus fibrosus is derived from surrounding mesenchyme (sclerotome), while vertebrae form from sclerotome and the spinal cord from neural tube.

## QUESTION

The structure marked A in the image below gives rise to which of the following structures?



A Gastrosplenic ligament

B Lienorenal ligament

C Falciform ligament

CORRECT

D Gastrophrenic ligament

## RIGHT ANSWER

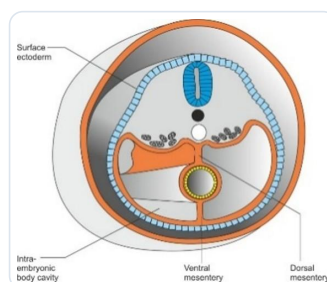
OK

C. Falciform ligament

## WHY THIS IS RIGHT

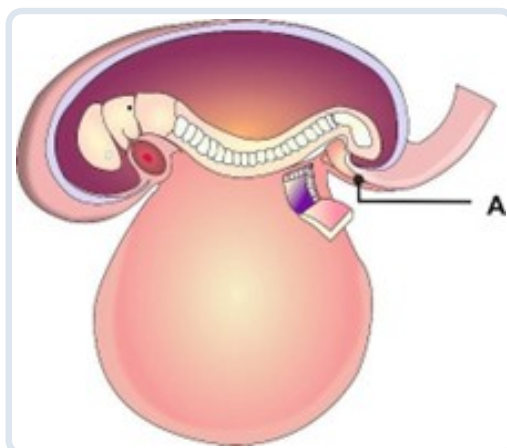
The marked structure is the ventral mesogastrium, which gives rise to the falciform ligament and lesser omentum.

In contrast, the gastrosplenic, lienorenal, and gastrophrenic ligaments are derivatives of the dorsal mesogastrium.



## QUESTION

Mark the option which develops from the structure marked A?



A Medial umbilical ligament

B Median umbilical ligament

CORRECT

C Meckel's diverticulum

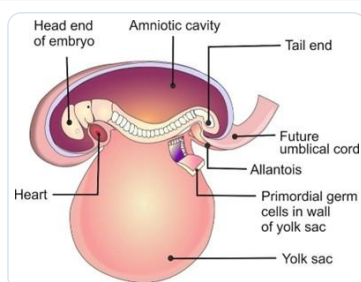
D Ligamentum teres

RIGHT ANSWER

OK B. Median umbilical ligament

## WHY THIS IS RIGHT

Marked structure A is the allantois, which forms the urachus, which in turn gives rise to the median umbilical ligament.

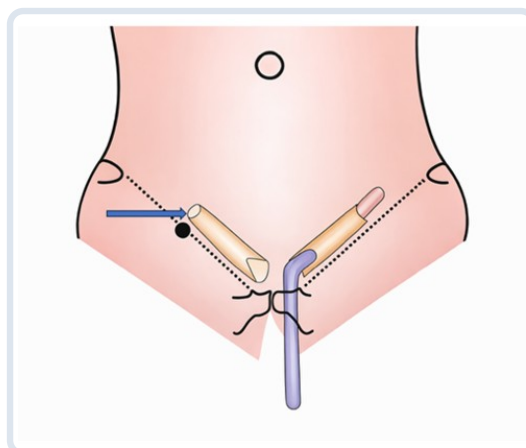


### Educational objective

| FETAL STRUCTURE     | DERIVATIVE                                         | POINTS                                                       |
|---------------------|----------------------------------------------------|--------------------------------------------------------------|
| Ductus Arteriosus   | Ligamentum Arteriosum                              | Located near Lt. recurrent laryngeal Nerve                   |
| Ductus Venosus      | Ligamentum Venosum                                 |                                                              |
| Foramen Ovale       | Fossa Ovalis                                       |                                                              |
| Allantois → Urachus | Median Umbilical Ligament                          | Urachus is a part of allantois between bladder and umbilicus |
| Umbilical Artery    | Medial Umbilical Ligament                          |                                                              |
| Umbilical Vein      | Ligamentum Teres Hepatis (Round ligament of liver) | Contained within falciform ligament                          |

## QUESTION

A defect in which of the following forms the structure marked below?



A Internal oblique

B External oblique

C Parietal peritoneum

D Fascia transversalis

CORRECT

## RIGHT ANSWER

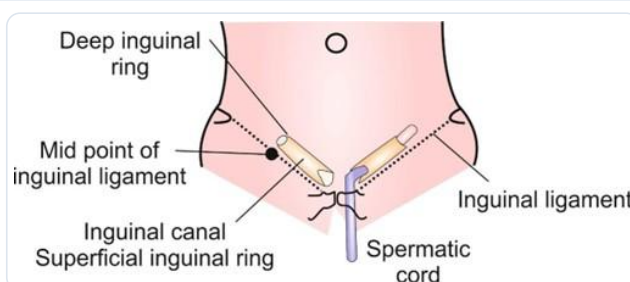
OK D. Fascia transversalis

## WHY THIS IS RIGHT

Marked structure is the deep inguinal ring, formed by a defect in fascia transversalis.

The deep inguinal ring is an opening in the transversalis fascia present 1 cm above the inguinal ligament, midway between the anterior superior iliac spine and the pubic symphysis.

An indirect inguinal hernia arises through the deep inguinal ring, lateral to the inferior epigastric vessel.



## QUESTION

| Covering of an omphalocele is derived from which of the following structures?

A Endoderm

B Mesoderm

C Chorion

D Amnion

CORRECT

## RIGHT ANSWER

OK D. Amnion

## WHY THIS IS RIGHT

In omphalocele, herniated abdominal contents are covered by a membrane composed of amnion externally and peritoneum internally.

This differentiates it from gastroschisis, where there is no covering membrane.

Endoderm and mesoderm form gut and body wall structures, not the external covering.

| Feature | Omphalocele | Gastroschisis |  
| ----- | ----- | ----- |  
| Midline | Yes | Usually right-sided |  
| Covered by sac | Yes | No |  
| Sac layer | Amnion | None |  
| Associated anomalies | Common | Rare |



## QUESTION

**Fecal discharge from the umbilicus is seen in which of the following conditions?**

A Gastroschisis

B Urachal fistula

C Omphalocele

**D Ileal diverticulum**

CORRECT

## RIGHT ANSWER

OK

**D. Ileal diverticulum**

## WHY THIS IS RIGHT

A patent vitellointestinal duct associated with Meckel's (ileal) diverticulum can present with fecal discharge from the umbilicus.

Vitellointestinal (Omphalomesenteric) duct-Connects midgut to yolk sac, normally obliterates

Urachus-Connects bladder to umbilicus, becomes median umbilical ligament

Urachal fistula causes urine discharge, while gastroschisis and omphalocele are anterior abdominal wall defects without fecal umbilical discharge.

A) Gastroschisis

Abdominal wall defect

Bowel protrudes

No fecal discharge from umbilicus

B) Urachal fistula

Persistent urachus

Causes urine discharge, not feces

C) Omphalocele

Midline abdominal wall defect

Covered by membrane

No fecal discharge

D) Ileal diverticulum

Associated with persistent vitellointestinal duct

Can form umbilical fistula

Fecal discharge

## QUESTION

The given image shows a congenital anomaly involving the anterior abdominal wall. What is the most likely diagnosis?



A Umbilical hernia

B Gastroschisis

C Bladder exstrophy

CORRECT

D Omphalocele

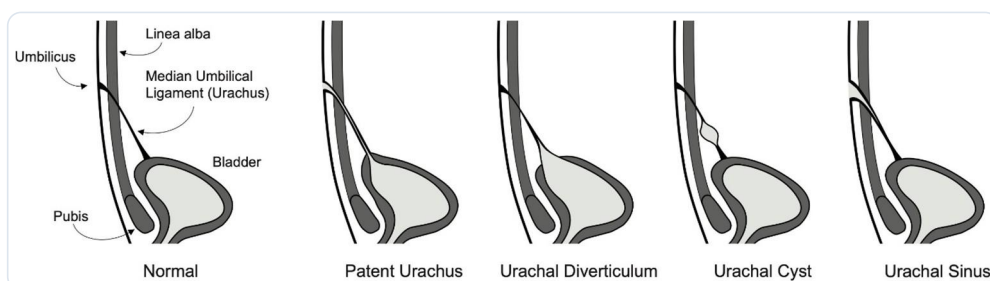
## RIGHT ANSWER

OK C. Bladder exstrophy

## WHY THIS IS RIGHT

Bladder exstrophy results from failure of closure of the lower anterior abdominal wall, leading to exposed posterior bladder wall on the surface.

Unlike omphalocele and gastroschisis, there is no covering membrane containing bowel, and the defect is infra-umbilical. Umbilical hernia presents as a skin-covered bulge at the umbilicus and does not expose visceral organs.



## QUESTION

Following fertilization, on which day does implantation of the embryo into the uterine endometrium begin?

A Day 15

B Day 8

C Day 2

D Day 6

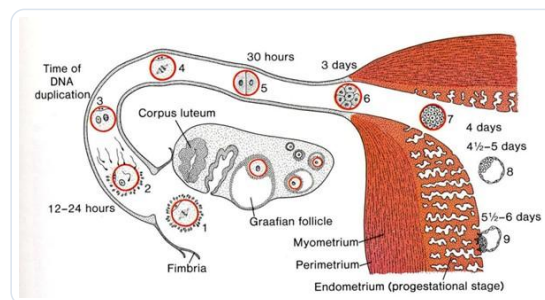
CORRECT

## RIGHT ANSWER

OK D. Day 6

## WHY THIS IS RIGHT

After fertilization, the zygote undergoes cleavage to form a blastocyst by day 4-5, which reaches the uterine cavity. Implantation begins around day 6 with attachment of the blastocyst to the endometrium. Earlier days correspond to cleavage stages, while day 15 is well beyond the implantation window.



## QUESTION

## | The oocyte phase in post-ovulation is:

- A** Primary oocyte arrested in prophase - I
- B** Secondary oocyte completed in prophase - II
- C** Primary oocyte arrested in prophase - II
- D** Secondary oocyte arrested in metaphase - II

CORRECT

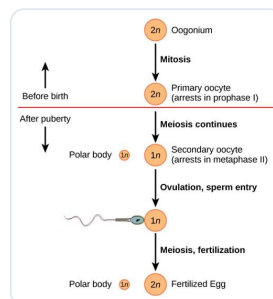
## RIGHT ANSWER

OK

**D. Secondary oocyte arrested in metaphase - II**

## WHY THIS IS RIGHT

After ovulation, the oocyte is a secondary oocyte that has completed meiosis I and entered meiosis II. It remains arrested in metaphase II until fertilization occurs. Primary oocyte arrest in prophase I occurs prenatally, not post-ovulation.



## QUESTION

Which of the following statements is wrong about the clinical paediatric case as shown in the image?



CORRECT

- A** It occurs due to the persistence of prochordal plate
- B** It occurs due to the defective migration of primordial cells to the genital ridge
- C** It contains skin, cartilage and bone
- D** It is a benign tumor of coccyx

## RIGHT ANSWER

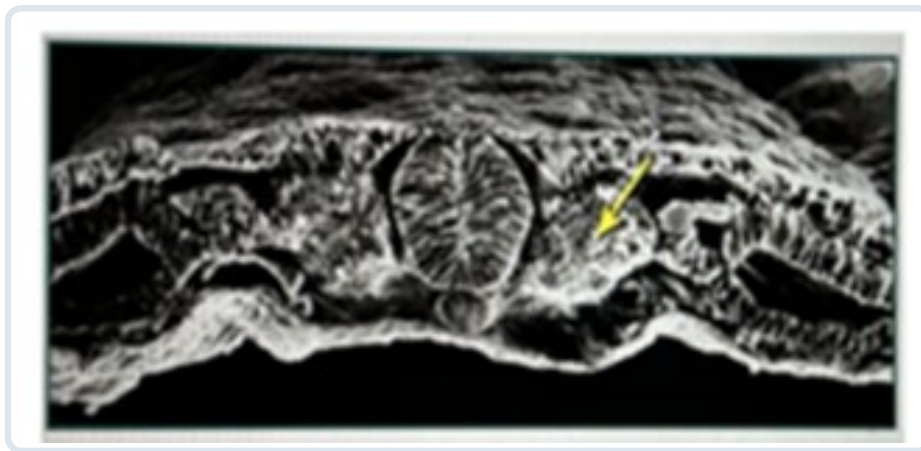
- OK** **A. It occurs due to the persistence of prochordal plate**

## WHY THIS IS RIGHT

The image represents a sacrococcygeal teratoma, which arises from defective migration of primordial germ cells to the genital ridge, not from persistence of the prochordal plate. These tumors commonly contain tissues from all three germ layers such as skin, cartilage, and bone, and are typically benign tumors arising from the coccyx in neonates.

## QUESTION

Given below is the image of a 33-hour chick embryo. Which of the following is derived from the marked structure?



- A Kidney
- B Dorsal root ganglion
- C Ribs
- D Parietal pleura

CORRECT

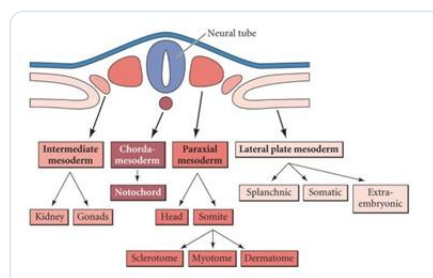
## RIGHT ANSWER

OK C. Ribs

## WHY THIS IS RIGHT

The correct answer is Ribs.

The marked structure in the 33-hour chick embryo represents the somite, specifically its sclerotome component. Sclerotome gives rise to vertebrae and ribs, while dermatome forms dermis and myotome forms skeletal muscle. Kidney (intermediate mesoderm), dorsal root ganglion (neural crest), and parietal pleura (lateral plate mesoderm) are derived from different embryological tissues.



## QUESTION

| The primary oocyte is arrested in which of the following stages?

A Pachytene

B Prophase

CORRECT

C Leptotene

D Metaphase

## RIGHT ANSWER

OK B. Prophase

## WHY THIS IS RIGHT

Primary oocytes arrest in prophase I (diplotene stage) from fetal life until puberty. Secondary oocyte arrests later in metaphase II until fertilization.

## QUESTION

**| Mitochondria of spermatozoa form which of the following parts?**

**A** Head sheath

**B** Connecting part

**C** Middle piece

CORRECT

**D** Tail

## RIGHT ANSWER

**OK** C. Middle piece

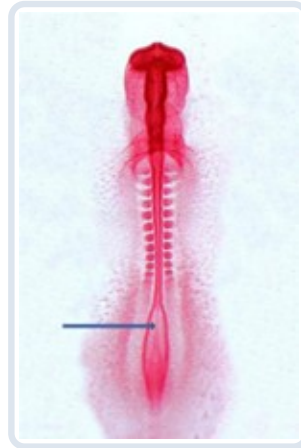
## WHY THIS IS RIGHT

Mitochondria are helical in the middle piece, supplying ATP for motility. The head contains nucleus/acrosome; tail contains axoneme; connecting piece is transitional.



## QUESTION

Identify the marked structure in the given image?



**A** Notochord

CORRECT

**B** Primitive streak

**C** Neural groove

**D** Neural crest cells

RIGHT ANSWER

**OK** A. Notochord

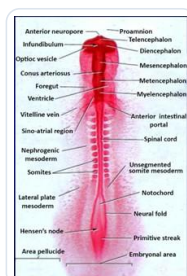
## WHY THIS IS RIGHT

The correct answer is Notochord.

The marked midline structure is the notochord, a rod-like axial mesodermal structure extending cranio-caudally beneath the neural tube.

It plays a key role in neural induction and later contributes to the nucleus pulposus of intervertebral discs.

Primitive streak is caudal and transient, neural groove is dorsal ectodermal, and neural crest cells migrate laterally rather than forming a midline rod.



## QUESTION

| Epiblast first migration lead to formation of?

A Ectoderm

B Endoderm

CORRECT

C Mesoderm

D Notochord

## RIGHT ANSWER

OK B. Endoderm

## WHY THIS IS RIGHT

The correct answer is Endoderm.

During gastrulation, the first wave of epiblast cell migration displaces the hypoblast to form the definitive endoderm.

The second wave forms intraembryonic mesoderm, while cells remaining in epiblast become ectoderm.

The notochord is derived later from axial mesoderm, not the initial migration.

## QUESTION

## | Primary follicles arrest in which phase of prophase 1?

A Leptotene

B Zygotene

C Pachytene

D Diplotene

CORRECT

## RIGHT ANSWER

OK D. Diplotene

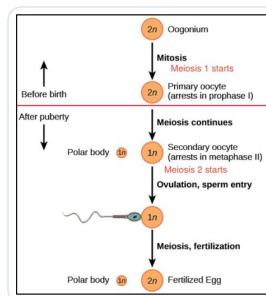
## WHY THIS IS RIGHT

The correct answer is Diplotene.

Primary oocytes remain arrested in the diplotene (dictyate) stage of prophase I from fetal life until puberty.

This arrest is maintained by oocyte maturation inhibitor (OMI) and meiosis resumes only at ovulation.

Leptotene, zygotene, and pachytene are earlier phases of prophase I that do not show physiological arrest.



## QUESTION

| Which of the following is NCC derivative for cardiac Structure?

A AV Cushion

B Septum primum

C SA node

D Conotruncal Septum

CORRECT

## RIGHT ANSWER

OK D. Conotruncal Septum

## WHY THIS IS RIGHT

The correct answer is Conotruncal septum.

Neural crest cells migrate into the cardiac outflow tract to form the aorticopulmonary (conotruncal) septum.

AV cushion, septum primum, and SA node are derived from endocardial mesenchyme or cardiogenic mesoderm, not neural crest.

## QUESTION

| All of the following are derivatives of NCC except:

**A** Retinal pigment membrane

CORRECT

**B** Ciliary muscles

**C** Melanocytes

**D** Ciliary ganglion

## RIGHT ANSWER

**OK** A. Retinal pigment membrane

## WHY THIS IS RIGHT

The correct answer is Retinal pigment membrane.

The retinal pigment epithelium is derived from neuroectoderm (optic cup), not neural crest cells.

Neural crest derivatives include ciliary muscle, melanocytes, and ciliary ganglion, making options B, C, and D incorrect.

## QUESTION

A 3-month-old infant is scheduled for cleft lip repair. During the surgical procedure, which of the following muscles is primarily corrected?

A Levator labii superioris

B Orbicularis oris

CORRECT

C Orbicularis oculi

D Masseter

## RIGHT ANSWER

OK B. Orbicularis oris

## WHY THIS IS RIGHT

Cleft lip results from failure of fusion of the maxillary prominence with the medial nasal prominence, disrupting the orbicularis oris muscle.

Orbicularis oris forms the sphincter of the mouth and is essential for lip seal and feeding.



## QUESTION

Which of the following are correctly matched?

1. First arch - Maxillary artery
2. Second arch - Hyoid or stapedial artery
3. Third arch - Common carotid artery and distal internal carotid artery
4. Sixth arch - Arch of the aorta
5. Fourth arch - Right proximal subclavian artery

**A** 1, 2, and 5

CORRECT

**B** 1, 2, and 3

**C** 1, 2, 3, and 5

**D** 1, 3, 4, and 5

RIGHT ANSWER

**OK** A. 1, 2, and 5

## WHY THIS IS RIGHT

First arch forms the maxillary artery, second arch gives hyoid and stapedial arteries, and the right fourth arch forms the proximal right subclavian artery.

The third arch forms the common carotid and proximal internal carotid artery (not distal), while the sixth arch forms pulmonary arteries and ductus arteriosus, not the aortic arch.

## QUESTION

| Which muscle is physically in the back but functionally in the thorax?

- A Rhomboid
- B Latissimus dorsi
- C Trapezius

**D Levator costae**

CORRECT

## RIGHT ANSWER

**D. Levator costae**

## WHY THIS IS RIGHT

The levator costarum muscles are anatomically located in the back (posterior thoracic region) but are functionally part of the thoracic wall because they assist in respiration by elevating the ribs.

- Origin: Transverse processes of C7-T11 vertebrae
- Insertion: Rib below the corresponding vertebra (between tubercle and angle)
- Action: Elevate ribs -> assist inspiration
- Innervation: Posterior rami of thoracic spinal nerves

Although these muscles lie in the posterior back region, their action on ribs during breathing places them functionally with thoracic muscles.



## QUESTION

| Which of the following is accurate regarding pericardial sinuses?

- A** Transverse sinus is between arterial and venous pericardial reflection.
- B** Oblique sinus lies behind left atrium
- C** Transverse sinus lies behind ascending aorta
- D** Oblique sinus allows a surgeon to ligate the pulmonary vessels

CORRECT

## RIGHT ANSWER

OK

**D. Oblique sinus allows a surgeon to ligate the pulmonary vessels**

## WHY THIS IS RIGHT

The pericardial sinuses are spaces formed by reflections of the serous pericardium around the great vessels of the heart.

1\ Transverse pericardial sinus

- Lies between arterial and venous ends of the heart.
- Anterior: Ascending aorta and pulmonary trunk
- Posterior: Superior vena cava
- Clinical importance: A surgeon can pass a finger or clamp through this sinus to control or ligate the ascending aorta and pulmonary trunk during cardiac surgery (e.g., cardiopulmonary bypass).

2\ Oblique pericardial sinus

- A blind recess behind the left atrium.
- Formed by reflections around the pulmonary veins and inferior vena cava.
- No surgical use for ligating vessels because it is a cul-de-sac.

## QUESTION

| Which among the following is incorrect regarding Sibsons's fascia?

CORRECT

**A** Attached to the inner border of 2nd rib

**B** Covers apical part of lung

**C** Part of scalenus minimus muscle

**D** Vessels pass above the fascia

## RIGHT ANSWER

OK

**A. Attached to the inner border of 2nd rib**

## WHY THIS IS RIGHT

Sibson's fascia (suprapleural membrane) is a thickened extension of the endothoracic fascia that forms a protective fibrous layer over the apex of the lung at the thoracic inlet.

- Medial: Transverse process of C7 vertebra
- Lateral: Inner border of the 1st rib and its costal cartilage

Therefore, the statement "attached to the inner border of the 2nd rib" is incorrect.

Relations and functions:

- Covers the cervical pleura and the apex of the lung
- Reinforced by fibers from the scalenus minimus muscle (when present)
- Provides support and protection to the lung apex during respiration

Major vessels such as the subclavian artery and vein pass above the suprapleural membrane.

## QUESTION

In which of the following chambers can one palpate a muscular ridge, which is the site of origin of pectinate muscles?

**A** Right atrium

CORRECT

**B** Left atrium

**C** Right ventricle

**D** Left ventricle

## RIGHT ANSWER

**OK** A. Right atrium

## WHY THIS IS RIGHT

The pectinate muscles are parallel muscular ridges present mainly in the right atrium, especially within the right auricle.

These muscles originate from a prominent vertical ridge called the crista terminalis, which separates two parts of the right atrium:

- Posterior smooth part (sinus venarum) - derived from the sinus venosus
- Anterior rough part with pectinate muscles - derived from the primitive atrium

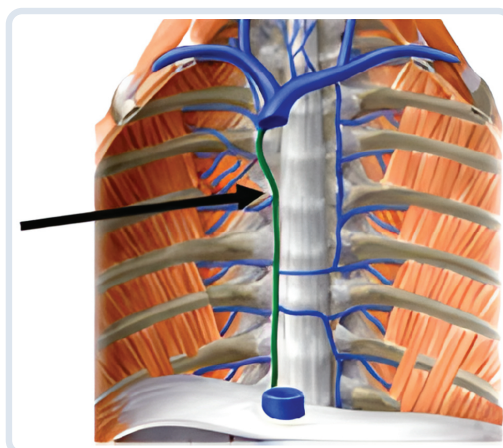
Clinical correlation:

- The crista terminalis serves as an important landmark for cardiac conduction pathways.
- It corresponds externally to the sulcus terminalis.

The left atrium is mostly smooth, with pectinate muscles confined only to the left auricle.

## QUESTION

Identify the tributaries of the vessel marked in the image except:



- A** Right ascending lumbar
- B** Right subcostal vein
- C** Right 5th posterior intercostal vein
- D** Left 5th posterior intercostal vein

CORRECT

## RIGHT ANSWER

- OK** D. Left 5th posterior intercostal vein

## WHY THIS IS RIGHT

The vessel marked in the image is the azygos vein, which runs on the right side of the vertebral column and drains the posterior thoracic wall into the superior vena cava. It is formed by the union of:

- Right ascending lumbar vein
- Right subcostal vein

The azygos vein receives:

- Right posterior intercostal veins (usually 5th-11th)
- Esophageal veins
- Mediastinal veins
- Right bronchial veins
- Right subcostal vein

Veins from the left thoracic wall usually drain into:

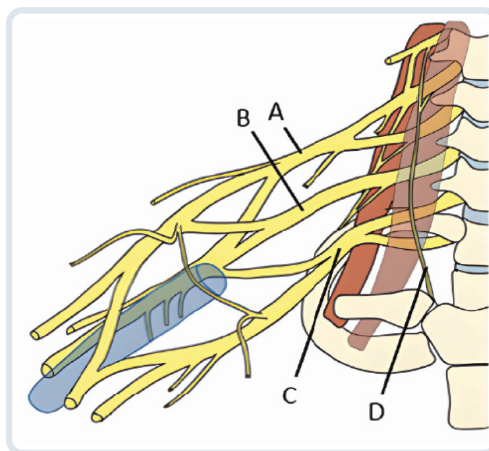
- Hemiazygos vein
- Accessory hemiazygos vein

These then cross the vertebral column to join the azygos vein.

Exception: Left 5th posterior intercostal vein drains into the accessory hemiazygos vein, not directly into the azygos vein.

## QUESTION

The man present with a case of cervical rib has tingling sensation and paresthesia on the medial side of arm. Which of the marked structure is most likely affected?



A A

B B

C C

CORRECT

D D

## RIGHT ANSWER

OK

C. C

## WHY THIS IS RIGHT

A cervical rib can compress the lower trunk of the brachial plexus (C8-T1), producing thoracic outlet syndrome. Clinical features of lower trunk compression:

- Paresthesia and tingling on the medial side of the arm and forearm
- Weakness of intrinsic hand muscles
- Possible ulnar nerve distribution symptoms

The lower trunk (C8-T1) lies close to the first rib and cervical rib, making it vulnerable to compression.

Structures affected: Nerves derived from C8-T1, especially:

- o Ulnar nerve
- o Medial cutaneous nerve of arm
- o Medial cutaneous nerve of forearm

In the diagram, the marked structure C corresponds to the lower trunk of the brachial plexus.

## QUESTION

You should not insert the needle below which level in midaxillary line so as not to damage the liver?

A 6th rib

B 10th rib

CORRECT

C 8th rib

D 12th rib

## RIGHT ANSWER

OK

B. 10th rib

## WHY THIS IS RIGHT

In the midaxillary line, the inferior border of the lung reaches the 8th rib, while the inferior border of the pleura extends to the 10th rib.

The liver lies just below the diaphragm on the right side, roughly at the level of the 10th rib in the midaxillary line. Therefore, inserting a needle below the 10th rib risks penetrating the diaphragm and injuring the liver.

## QUESTION

A 66-year-old man hospitalized 3 days ago for left lower lobe pneumonia is evaluated for persistent fever. He has been receiving the appropriate intravenous antibiotics as determined by antibiotic susceptibility testing of his sputum cultures. The patient has a history of diabetes mellitus and hypertension. His temperature is 38°C (100.4°F) and pulse is 87/min. Examination shows dullness to percussion and decreased breath sounds over the left lower lung. Imaging studies reveal a loculated, left-sided pleural effusion. A tube is placed to drain the fluid via an incision at the 5th intercostal space in the midaxillary line. Which of the following muscles is most likely to be dissected during the procedure?

A External oblique

B Latissimus dorsi

C Pectoralis major

D Serratus anterior

CORRECT

## RIGHT ANSWER

OK D. Serratus anterior

## WHY THIS IS RIGHT

A chest tube for pleural drainage is commonly inserted in the 5th intercostal space at the midaxillary line (within the “safe triangle” of thoracostomy).

Layers encountered during insertion:

Skin -> superficial fascia -> Serratus anterior muscle -> intercostal muscles -> parietal pleura -> pleural cavity.

The serratus anterior lies on the lateral thoracic wall in the midaxillary line, so it is typically dissected when inserting a chest tube at this site.

Other options:

- External oblique: located in the abdominal wall, not the thoracic insertion site.
- Latissimus dorsi: forms the posterior boundary of the safe triangle but is usually avoided.
- Pectoralis major: located anteriorly on the chest wall.

## QUESTION

| Which among the following is wrong about the venous drainage of the heart?

- A** Coronary sinus is guarded by the thebesian valve
- B** Middle cardiac vein lies in the posterior atrioventricular groove
- C** Great cardiac vein accompanies left anterior descending artery
- D** Anterior cardiac vein opens into RA directly

CORRECT

## RIGHT ANSWER

- OK** **B. Middle cardiac vein lies in the posterior atrioventricular groove**

## WHY THIS IS RIGHT

The middle cardiac vein (posterior interventricular vein) runs in the posterior interventricular groove, accompanying the posterior interventricular artery (PDA), and drains into the coronary sinus.

Key points of cardiac venous drainage:

- Coronary sinus drains most cardiac veins into the right atrium and is guarded by the Thebesian valve.
- Great cardiac vein runs in the anterior interventricular groove with the left anterior descending (LAD) artery.
- Anterior cardiac veins drain the right ventricle directly into the right atrium, bypassing the coronary sinus.

The middle cardiac vein does NOT lie in the posterior atrioventricular groove; it lies in the posterior interventricular groove.



## QUESTION

A 55-year-old patient with chronic obstructive lung disease is being evaluated for altered venous return during respiration. During deep inspiration, different diaphragmatic openings show characteristic physiological changes that influence venous blood flow, gastroesophageal competence, and systemic circulation. Which of the following combinations correctly represents the behavior of the diaphragmatic openings during inspiration?

- A IVC narrows, esophageal opening widens, aortic opening narrows
- B IVC dilates, esophageal opening narrows, aortic opening remains unchanged**
- C IVC remains unchanged, esophageal opening narrows, aortic opening widens
- D IVC dilates, esophageal opening widens, aortic opening narrows

CORRECT

## RIGHT ANSWER

OK

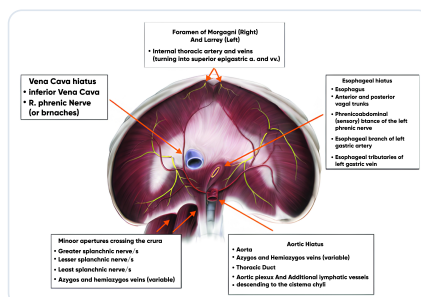
**B. IVC dilates, esophageal opening narrows, aortic opening remains unchanged**

## WHY THIS IS RIGHT

During inspiration, contraction of the diaphragm alters the diameter of its three major openings, affecting venous return and gastrointestinal function.

Changes during inspiration:

- Inferior vena cava (IVC) opening - T8:
  - o Located in the central tendon
  - o Dilates during inspiration due to downward movement of the diaphragm
  - o Increases venous return to the right atrium
- Esophageal opening - T10:
  - o Surrounded by the right crus of the diaphragm
  - o Narrows during inspiration, helping prevent gastroesophageal reflux
- Aortic opening - T12:
  - o Formed by the median arcuate ligament
  - o Remains unchanged because it is not compressed by diaphragmatic contraction



## QUESTION

| Which of the following structures is not derived from the septum transversum?

A Falciform ligament

B Ligamentum teres

CORRECT

C Coronary ligament

D Lesser omentum

## RIGHT ANSWER

OK B. Ligamentum teres

## WHY THIS IS RIGHT

The septum transversum is a mesodermal structure that contributes to the formation of several peritoneal ligaments of the liver and the central tendon of the diaphragm.

Structures derived from the septum transversum:

- Falciform ligament
- Coronary ligament
- Lesser omentum (hepatogastric and hepatoduodenal ligaments)
- These ligaments help attach the liver to the anterior abdominal wall, diaphragm, and stomach/duodenum.

Exception:

- Ligamentum teres hepatis is not derived from the septum transversum.
- It is the fibrous remnant of the left umbilical vein from fetal circulation.

## QUESTION

**| Where does esophageal venous drainage go?**

- A** Azygous and inferior thyroid veins
- B** **Azygous, Inferior thyroid and left gastric vein** CORRECT
- C** Azygous, Inferior thyroid and right gastric vein
- D** Superior thyroid, inferior thyroid, azygous and hemiazygous

## RIGHT ANSWER

- OK** **B. Azygous, Inferior thyroid and left gastric vein**

## WHY THIS IS RIGHT

The esophagus has segmental venous drainage corresponding to its cervical, thoracic, and abdominal parts. These veins ultimately drain into both the systemic venous system and the portal venous system, forming an important portosystemic (porto-caval) anastomosis.

## 1. Cervical part

- Drains into the inferior thyroid veins -> brachiocephalic veins.

## 2. Thoracic part

- Drains mainly into the azygos vein and hemiazygos vein -> superior vena cava.

## 3. Abdominal part

- Drains into the left gastric vein -> portal vein.

At the lower end of the esophagus, there is a portosystemic anastomosis between:

- Left gastric vein (portal circulation)
- Azygos system (systemic circulation)

## QUESTION

Which of the following statements with respect to histology of alveoli is incorrect?

- A** The most abundant cell type lines form 70-90% of the alveolar surface and are of simple squamous type.
- B** Type II alveolar epithelial cells are microvilli-containing cells which secrete surfactant similar to that of Clara cells.
- C** In some alveolar area, basement membrane of the endothelium fuses with that of the alveolar epithelium.
- D** Type I alveolar epithelial cells are involved in replacing the damaged type II alveolar cells. CORRECT

## RIGHT ANSWER

OK

**D. Type I alveolar epithelial cells are involved in replacing the damaged type II alveolar cells.**

## WHY THIS IS RIGHT

The alveoli are the primary sites of gas exchange in the lungs and are lined by two types of pneumocytes. Cell types in alveoli:

- Type I pneumocytes:

- o Simple squamous cells
- o Cover 70-90% of the alveolar surface
- o Responsible for gas exchange

- Type II pneumocytes:

- o Cuboidal cells with microvilli
- o Secrete pulmonary surfactant (similar functionally to Clara/club cells)
- o Act as stem cells, capable of dividing and differentiating into Type I pneumocytes to repair alveolar lining.

Alveolar-capillary barrier:

- In many areas, the basement membrane of the alveolar epithelium fuses with that of the capillary endothelium, minimizing diffusion distance.

The incorrect statement is that Type I cells replace damaged Type II cells, because actually Type II cells regenerate both Type I and Type II pneumocytes.

## QUESTION

A 60-year-old female undergoes right lower lobe resection for a tumor. Which statement about bronchopulmonary segments is true?

- A Each segment shares a bronchus with adjacent segments.
- B Segments are supplied by segmental arteries and share venous drainage.**
- C Each segment has independent arterial and venous supplies.
- D The shape is pyramidal with the base at the hilum.

CORRECT

## RIGHT ANSWER

- B. Segments are supplied by segmental arteries and share venous drainage.**

## WHY THIS IS RIGHT

A bronchopulmonary segment is a functionally independent subdivision of a lung lobe supplied by a segmental (tertiary) bronchus and its accompanying branch of the pulmonary artery. Key features:

- Each segment has its own segmental bronchus and segmental pulmonary artery.
- Pulmonary veins run in the intersegmental planes, so venous drainage is shared between adjacent segments.
- Segments are separated by connective tissue septa, allowing surgical resection of individual segments (segmentectomy).
- Each segment is pyramidal in shape, with the apex toward the hilum and base toward the lung surface.

Incorrect statements:

- A. Segments do not share bronchi.
- C. Venous drainage is not completely independent.
- D. The base is at the pleural surface, not at the hilum.

## QUESTION

A 45-year-old man is undergoing evaluation for palpitations. ECG reveals a supraventricular tachycardia with HR of 190/min. An echocardiogram reveals hypertrophy of the right ventricle and enlargement of the right ventricular outflow tract. Which structure separates the inflow and outflow tracts in the right ventricle?

A Crista terminalis

B Supraventricular crest

CORRECT

C Moderator band

D Interventricular septum

## RIGHT ANSWER

OK B. Supraventricular crest

## WHY THIS IS RIGHT

The right ventricle has two functional parts:

- Inflow tract (sinus part) -> receives blood from the tricuspid valve
- Outflow tract (infundibulum or conus arteriosus) -> leads to the pulmonary trunk

These two parts are separated by a muscular ridge called the supraventricular crest.

Key anatomical features:

- Supraventricular crest: separates the inflow tract from the outflow tract of the right ventricle.
- Crista terminalis: ridge in the right atrium, separating smooth and rough parts.
- Moderator band (septomarginal trabecula): carries part of the right bundle branch to the anterior papillary muscle.
- Interventricular septum: separates right and left ventricles.

## QUESTION

| Which of the following statements about cardiac jelly is incorrect?

- A** Provide structural support during early heart development
- B** Facilitates end-systolic occlusion, improving pumping efficiency
- C** Store elastic energy during systole for the refilling phase of the heart.
- D** Cellular matrix secreted by the endocardium in the developing heart. CORRECT

## RIGHT ANSWER

- OK** **D. Cellular matrix secreted by the endocardium in the developing heart.**

## WHY THIS IS RIGHT

Cardiac jelly is a gelatinous extracellular matrix located between the endocardium and myocardium during early heart development. Functions:

- Provides structural support to the developing heart tube.
- Helps in endocardial cushion formation, which later contributes to heart valves and septa.
- Aids early pumping efficiency by allowing end-systolic occlusion of the heart lumen.

Origin:

- Cardiac jelly is secreted primarily by myocardial cells, not by the endocardium.

Therefore, the statement “Cellular matrix secreted by the endocardium in the developing heart” is incorrect.

## QUESTION

| Which of the following statements about the scalenus anterior muscle is incorrect?

- A** The phrenic nerve lies anteriorly to the muscle.
- B** The thoracic duct arches laterally on the right side. CORRECT
- C** The brachial plexus is posterior to the muscle.
- D** The lateral part of the carotid sheath contains the internal jugular vein.

## RIGHT ANSWER

- OK** **B. The thoracic duct arches laterally on the right side.**

## WHY THIS IS RIGHT

The scalenus anterior muscle is an important landmark in the root of the neck, arising from the transverse processes of C3-C6 and inserting on the first rib.

- Phrenic nerve runs anterior to scalenus anterior on its surface.
- Brachial plexus and subclavian artery pass posterior to scalenus anterior (between anterior and middle scalene muscles).
- Subclavian vein lies anterior to scalenus anterior.
- In the carotid sheath, the internal jugular vein lies laterally, common carotid artery medially, and vagus nerve posteriorly.

Thoracic duct relation:

- The thoracic duct arches laterally and empties into the venous angle on the LEFT side, not the right.

Therefore, the incorrect statement is that the thoracic duct arches laterally on the right side.



## QUESTION

A 40-year-old patient accidentally swallowed a fish bone and presented with choking. On examination, the bone was found to be impacted in the esophagus at the level of T4 vertebra. Which of the following structures is responsible for the obstruction at this level?

A Cricopharyngeal junction

B Left bronchus

C Arch of aorta

CORRECT

D Diaphragm

RIGHT ANSWER

OK

C. Arch of aorta

## WHY THIS IS RIGHT

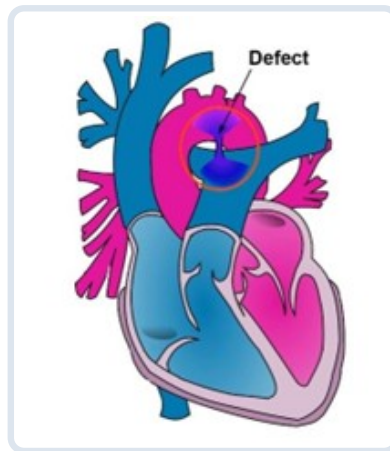
The esophagus has physiological constrictions, one of which occurs at the T4 vertebral level due to the arch of aorta crossing anterior to the esophagus.

This site is a common location for foreign body impaction, especially fish bones.

The cricopharyngeal junction lies at C6, the left bronchus crosses at T5-T6, and the diaphragm constriction is at T10.

## QUESTION

A defect in which of the following aortic arches causes the defect shown in the image?



A 4th left

B 4th right

C 6th left

CORRECT

D 6th right

RIGHT ANSWER

OK C. 6th left

## WHY THIS IS RIGHT

The ductus arteriosus is derived from the left 6th pharyngeal arch artery, and its persistence results in patent ductus arteriosus (PDA).

The 4th arch contributes to the aortic arch and subclavian artery, while the right 6th arch regresses, so defects there do not produce PDA.

## QUESTION

**Common site for congenital diaphragmatic hernia is:**

- A** Anterolateral
- B** Central tendon
- C** Crural
- D** Posterolateral

CORRECT

## RIGHT ANSWER

- OK** **D. Posterolateral**

## WHY THIS IS RIGHT

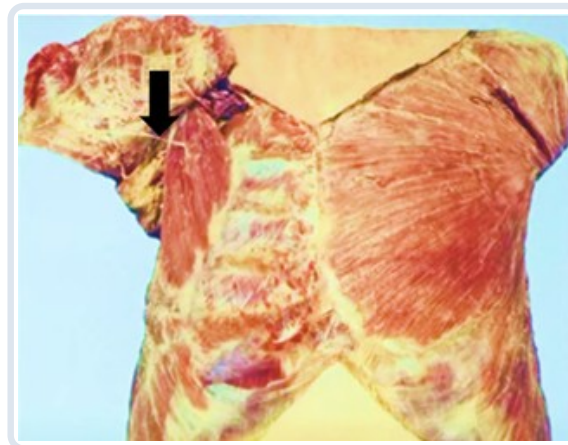
Congenital diaphragmatic hernia most commonly occurs through the foramen of Bochdalek, a posterolateral defect of the diaphragm.

It results from failure of closure of the pleuroperitoneal membrane, leading to herniation of abdominal contents into the thoracic cavity.

Anterior defects (foramen of Morgagni) are less common and usually right-sided.

## QUESTION

Identify the marked nerve.



A Thoracodorsal nerve

B Lateral pectoral nerve

C **Medial pectoral nerve**

CORRECT

D Long thoracic nerve

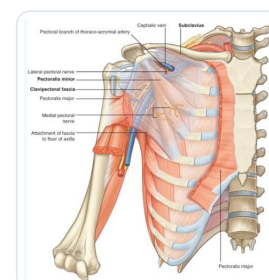
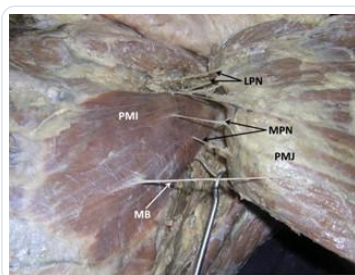
## RIGHT ANSWER

OK C. Medial pectoral nerve

## WHY THIS IS RIGHT

The marked nerve pierces and supplies the pectoralis minor and then continues to supply the pectoralis major, a classic identifying feature of the medial pectoral nerve.

The lateral pectoral nerve supplies pectoralis major without piercing muscle, thoracodorsal nerve supplies latissimus dorsi, and long thoracic nerve supplies serratus anterior and runs on the chest wall.



## QUESTION

The epithelium shown in the image is typically found in which of the following locations in the human body?



CORRECT

**A** Ureter**B** Gallbladder**C** Intestine**D** Trachea

RIGHT ANSWER

OK

**A. Ureter**

## WHY THIS IS RIGHT

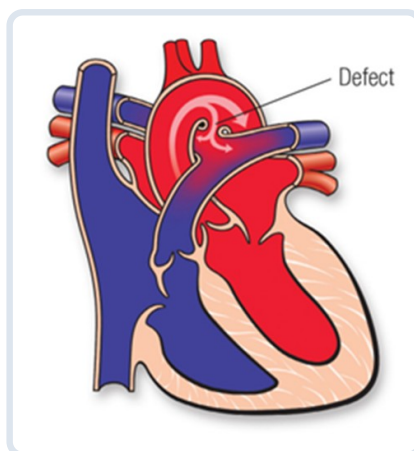
it lines parts of the urinary tract: Renal pelvis, Ureter, Urinary bladder, Proximal urethra

The image shows transitional epithelium (urothelium) with characteristic features:

1. Multiple layers (stratified epithelium)
2. Umbrella cells at surface - large dome-shaped cells
3. Internalization of cell membrane (clear spaces in umbrella cells)
4. Changes appearance when stretched

## QUESTION

Which aortic arch artery abnormality is responsible for producing the defect shown in the image?



A Right 4th pharyngeal arch artery

B Left 4th pharyngeal arch artery

C Right 6th pharyngeal arch artery

D Left 6th pharyngeal arch artery

CORRECT

## RIGHT ANSWER

OK

D. Left 6th pharyngeal arch artery

## WHY THIS IS RIGHT

The ductus arteriosus is derived from the left 6th aortic arch, and its persistence after birth results in patent ductus arteriosus (PDA).

The right 6th arch largely regresses, while the 4th arch arteries contribute to the aortic arch and subclavian artery, not PDA.

## QUESTION

Which of the following is a tributary of the inferior vena cava?

CORRECT

A Left inferior phrenic vein

B Left supra-renal vein

C Left gonadal vein

D Right ascending lumbar vein

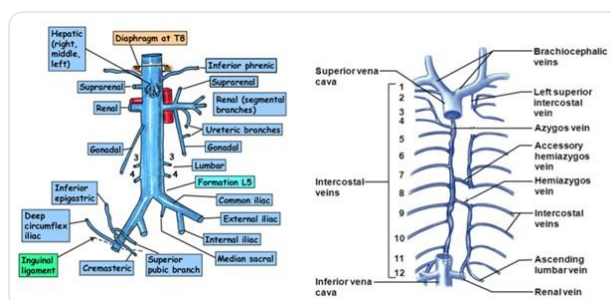
## RIGHT ANSWER

OK

A. Left inferior phrenic vein

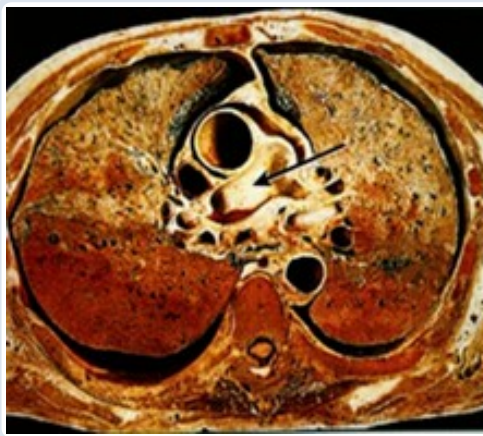
## WHY THIS IS RIGHT

The inferior vena cava (IVC) directly receives the inferior phrenic veins, including the left one. In contrast, the left suprarenal and left gonadal veins drain into the left renal vein, not directly into the IVC. The ascending lumbar veins contribute to the azygos system, not the IVC.



## QUESTION

Identify the structure marked with an arrow:



- A Carina
- B Superior vena cava
- C Pulmonary trunk
- D Arch of Aorta

CORRECT

## RIGHT ANSWER

OK

C. Pulmonary trunk

## WHY THIS IS RIGHT

The pulmonary trunk lies anterior and left to the ascending aorta and arises from the right ventricle, making it identifiable in thoracic cross-sections.

The arch of aorta is more posterior and leftward, SVC lies on the right side of mediastinum, and carina is an airway bifurcation, not a vascular structure.



## QUESTION

In given image, nucleus of marked nerve is related to which of the following?



- A Midbrain
- B Pons
- C Medulla
- D Cervical spinal segment**

CORRECT

## RIGHT ANSWER

- OK
- D. Cervical spinal segment**

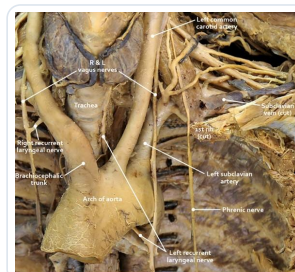
## WHY THIS IS RIGHT

The correct answer is Cervical spinal segment.

The marked nerve is the phrenic nerve, whose motor nucleus lies in the ventral horn of cervical spinal cord segments C3-C5.

It provides the sole motor supply to the diaphragm, with the mnemonic "C3, 4, 5 keep the diaphragm alive."

Midbrain, pons, and medulla contain cranial nerve nuclei, not the origin of the phrenic nerve.



## QUESTION

Identify the vertebral level of section in given image.



A T9

CORRECT

B T10

C T11

D T12

RIGHT ANSWER

OK

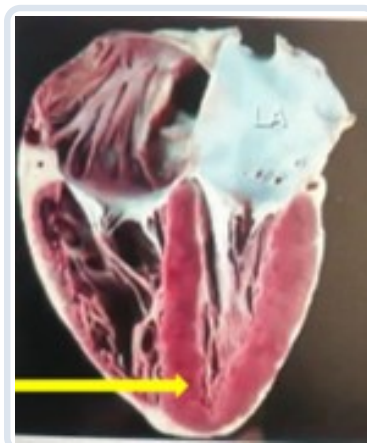
A. T9

## WHY THIS IS RIGHT

The T9 vertebral level in cross-sectional anatomy images often shows the liver, stomach, heart, and lungs, making it a key point for identifying these structures.

## QUESTION

| Artery supplying near marked structure is?



- A** Left circumflex artery
- B** Left marginal artery
- C** Anterior interventricular artery
- D** Posterior interventricular artery

CORRECT

## RIGHT ANSWER

- OK** C. Anterior interventricular artery

## WHY THIS IS RIGHT

The correct answer is Anterior interventricular artery (LAD).

The LAD, a branch of the left coronary artery, runs in the anterior interventricular groove and supplies the anterior wall of left ventricle and anterior 2/3 of interventricular septum.

The left circumflex artery supplies the lateral/posterior left ventricle, the left marginal artery supplies the obtuse margin, and the posterior interventricular artery supplies the posterior septum and inferior wall.

## QUESTION

| Choose the true statement regarding breast.

- A** Superior & medial quadrant has more tissue
- B** 10 lobules are present
- C** Axillary tail of Spence crosses anterior axillary fold CORRECT
- D** Nipple is located at 4th intercostal space in most of the females

## RIGHT ANSWER

- OK** **C. Axillary tail of Spence crosses anterior axillary fold**

## WHY THIS IS RIGHT

The correct answer is Axillary tail of Spence crosses the anterior axillary fold.

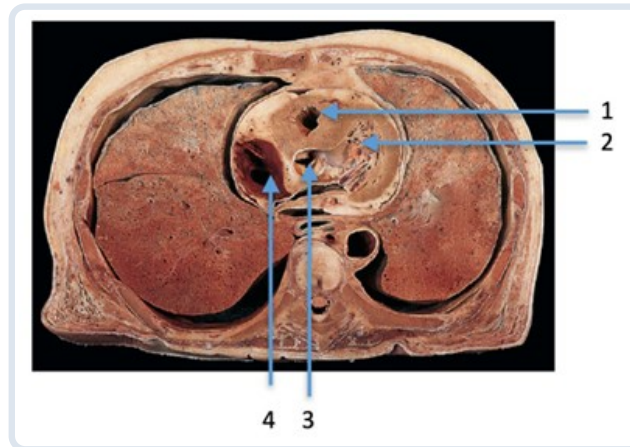
The axillary tail is a superolateral extension of breast tissue that passes into the axilla across the anterior axillary fold, making it clinically important in breast examination and surgery. The axillary tail is an extension of upper outer quadrant, it passes through the foramen of Langer, enters the axilla and lies along the lateral border of pectoralis major.

The superolateral quadrant (not superomedial) has maximum breast tissue, breasts have 15-20 lobules, and the nipple is usually at the 4th intercostal space in males, not consistently in females.

## QUESTION

In the labelled transverse section of the thorax at the level of the heart shown below, match each numbered structure (1-4) with the appropriate anatomical or clinical description:

1. Undergoes hypertrophy on pulmonary stenosis
2. Receives oxygenated blood
3. Arises from left ventricle
4. Lies to the right of ascending aorta



**A** 1-Undergoes hypertrophy on pulmonary stenosis, 2-Receives oxygenated blood, 3-Arises from left ventricle, 4- Lies to the right of ascending aorta **CORRECT**

**B** 1-Receives oxygenated blood, 2- Undergoes hypertrophy on pulmonary stenosis, 3-Arises from left ventricle, 4- Lies to the right of ascending aorta

**C** 1-Receives oxygenated blood, 2- Undergoes hypertrophy on pulmonary stenosis, 3- Lies to the right of ascending aorta, 4-Arises from left ventricle

**D** 1-Receives oxygenated blood, 2- Arises from left ventricle, 3- Lies to the right of ascending aorta, 4- Undergoes hypertrophy on pulmonary stenosis

## RIGHT ANSWER

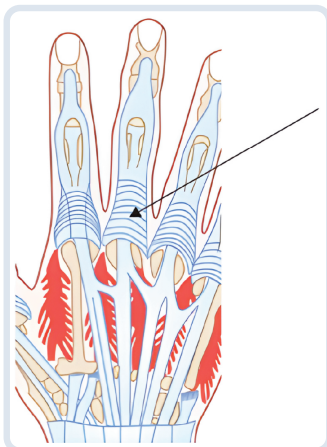
**OK** **A. 1-Undergoes hypertrophy on pulmonary stenosis, 2-Receives oxygenated blood, 3-Arises from left ventricle, 4- Lies to the right of ascending aorta**

## WHY THIS IS RIGHT

Structure 1 is the right ventricle, which undergoes hypertrophy in pulmonary stenosis.  
Structure 2 corresponds to the left atrium, which receives oxygenated blood from pulmonary veins, while 3 is the ascending aorta arising from the left ventricle.  
Structure 4 is the pulmonary trunk, which lies to the right of the ascending aorta in transverse section.

## QUESTION

| All the following form the marked structure except:



A 2nd Dorsal interossei

B Lumbricals

C Extensor digitorum

D 2nd Palmar interossei

CORRECT

## RIGHT ANSWER

OK D. 2nd Palmar interossei

## WHY THIS IS RIGHT

The marked structure represents the extensor expansion (dorsal digital expansion/extensor hood) of the fingers. It is a triangular aponeurotic structure on the dorsum of the proximal phalanx that helps coordinate extension of the fingers.

The extensor expansion is formed by contributions from:

- Extensor digitorum tendon (central component)
- Lumbricals
- Dorsal interossei muscles

These structures insert into the expansion and help produce MCP flexion with IP extension, enabling fine finger movements.

Palmar interossei insert on the base of proximal phalanx and extensor expansion of their respective digits, but the 2nd palmar interosseous specifically acts on the ring finger and is not part of the marked expansion shown in the diagram, making it the incorrect option here.

## QUESTION

Which of the following combinations forms the principal arterial anastomosis around the scapula?

- A Suprascapular, lateral thoracic, profunda brachii
- B Suprascapular, dorsal scapular, circumflex scapular**
- C Thoracoacromial, profunda brachii, lateral thoracic
- D Posterior circumflex humeral, anterior circumflex humeral, profunda brachii

CORRECT

## RIGHT ANSWER

- B. Suprascapular, dorsal scapular, circumflex scapular**

## WHY THIS IS RIGHT

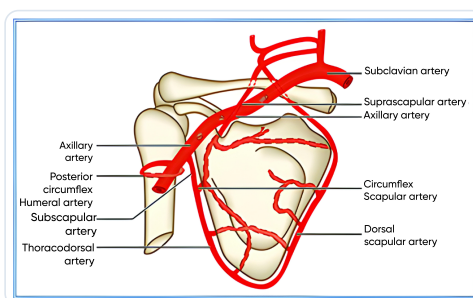
The scapular anastomosis is an important arterial network that provides collateral circulation between the subclavian artery and axillary artery, especially when the axillary artery is occluded proximal to the subscapular artery.

Principal arteries involved:

- Suprascapular artery (branch of the thyrocervical trunk from the subclavian artery)
- Dorsal scapular artery (from the subclavian artery)
- Circumflex scapular artery (branch of the subscapular artery from the axillary artery)

Location of anastomosis: Around the scapula, especially near the supraspinous and infraspinous fossae and medial border of the scapula.

Maintains blood flow to the upper limb if the axillary artery is ligated or obstructed proximal to the subscapular artery.



## QUESTION

A muscle that adducts and medially rotates the arm at the shoulder is found arising from the inferior angle of the scapula and inserted into the medial lip of the intertubercular sulcus of the humerus. Which nerve supplies it?

A Thoracodorsal nerve

B Lower subscapular nerve

CORRECT

C Dorsal scapular nerve

D Axillary nerve

## RIGHT ANSWER

OK

B. Lower subscapular nerve

## WHY THIS IS RIGHT

The muscle described is teres major.

- Origin: Inferior angle of the scapula
- Insertion: Medial lip of the intertubercular sulcus of the humerus
- Actions:

- o Adduction of the arm
- o Medial rotation of the arm
- o Assists in extension of the shoulder

Nerve supply: Lower subscapular nerve (C5-C6) from the posterior cord of the brachial plexus.

Teres major forms part of the posterior axillary fold and the lower boundary of the quadrangular and triangular spaces in the axillary region.

Other options:

- Thoracodorsal nerve: supplies latissimus dorsi.
- Dorsal scapular nerve: supplies rhomboids and levator scapulae.
- Axillary nerve: supplies deltoid and teres minor.



## QUESTION

**| Struthers syndrome results from compression of:**

- A** Ulnar nerve under Osborne's ligament
- B** Radial nerve in the radial tunnel
- C** Median nerve beneath a ligament from supracondylar process to medial epicondyle **CORRECT**
- D** Musculocutaneous nerve in the coracobrachialis

## RIGHT ANSWER

- OK** **C. Median nerve beneath a ligament from supracondylar process to medial epicondyle**

## WHY THIS IS RIGHT

Struthers syndrome is a rare condition caused by compression of the median nerve beneath the ligament of Struthers.

- The ligament of Struthers is a fibrous band extending from the supracondylar process of the humerus to the medial epicondyle.
- The median nerve and sometimes the brachial artery pass beneath this ligament.

Clinical features:

- Median nerve compression symptoms, similar to proximal median neuropathy:

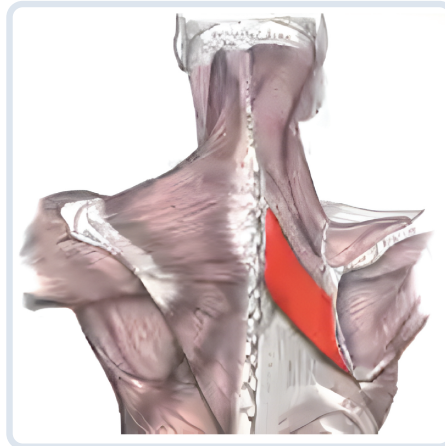
- o Pain or paresthesia in the lateral 3½ fingers
- o Weakness of forearm flexors and thenar muscles

Important distinction:

- Struthers syndrome: compression above the elbow by ligament of Struthers.
- Carpal tunnel syndrome: compression at the wrist under the flexor retinaculum.

## QUESTION

| All of the following statements about the marked muscle are correct except:



- A** Retracts the scapula along with the middle fibres of trapezius
- B** Elevates the scapula along with fibres of trapezius
- C** Rotates the scapula so that glenoid cavity tilts inferiorly
- D** Rotates the scapula so that glenoid cavity tilts superiorly

CORRECT

## RIGHT ANSWER

OK

**D. Rotates the scapula so that glenoid cavity tilts superiorly**

## WHY THIS IS RIGHT

The marked muscle is the rhomboid major, a muscle of the superficial layer of the back that connects the thoracic vertebrae to the medial border of the scapula.

Origin: Spinous processes of T2-T5 vertebrae

Insertion: Medial border of the scapula (from the level of the spine to the inferior angle)

Nerve supply: Dorsal scapular nerve (C5)

## Actions:

- Retracts (adducts) the scapula with the middle fibers of trapezius
- Elevates the scapula
- Downward rotation of the scapula, causing the glenoid cavity to tilt inferiorly
- Stabilizes the scapula against the thoracic wall

## QUESTION

A 40 year old male patient presents with a shoulder injury following a fall. During a physical examination, the physician palpates the brachial artery to assess the blood supply to the arm. At which anatomical landmark does this artery begin as a continuation of the axillary artery?

A Lower border of the teres minor

B Upper border of the teres major

C Lower border of the teres major

CORRECT

D Upper border of the teres minor

## RIGHT ANSWER

OK

C. Lower border of the teres major

## WHY THIS IS RIGHT

The brachial artery is the continuation of the axillary artery. Anatomical transition:

- The axillary artery becomes the brachial artery at the lower border of the teres major muscle.
- The brachial artery then travels down the arm in the medial bicipital groove and eventually divides into the radial and ulnar arteries at the level of the neck of the radius in the cubital fossa.

Clinical relevance:

- The brachial artery pulse can be palpated in the medial aspect of the arm.
- It is commonly used for blood pressure measurement and arterial catheterization.

## QUESTION

**A 35-year-old man presents with inability to extend his wrist and fingers. O/E, he exhibits a wrist drop and demonstrates weakness in elbow extension & loss of sensation over the posterior arm and the lateral aspect of the dorsum of the hand. Based on these findings, at which level is the radial nerve likely injured?**

**A At the axilla**

CORRECT

B At the spiral groove

C Lateral epicondyle of the humerus

D Posterior interosseous nerve at the forearm

## RIGHT ANSWER

**A. At the axilla**

## WHY THIS IS RIGHT

The radial nerve supplies the extensor muscles of the arm and forearm and provides sensory innervation to the posterior arm, posterior forearm, and dorsolateral hand.

Radial nerve injury at the axilla (e.g., crutch palsy):

- Loss of elbow extension -> paralysis of triceps brachii
- Wrist drop -> paralysis of wrist extensors
- Inability to extend fingers
- Sensory loss over posterior arm, posterior forearm, and dorsolateral hand

Triceps involvement indicates the lesion is proximal, before branches to the triceps.

Other lesion levels:

- B. Spiral groove: triceps usually spared -> elbow extension preserved.
- C. Lateral epicondyle region: affects distal branches but triceps function remains intact.
- D. Posterior interosseous nerve: only motor deficit (finger extension), no sensory loss.

## QUESTION

Which of the following is not a content in the 4th compartment of extensor retinaculum?

- A Extensor digitorum
- B Extensor indicis
- C Posterior interosseous nerve
- D Extensor pollicis brevis

CORRECT

## RIGHT ANSWER

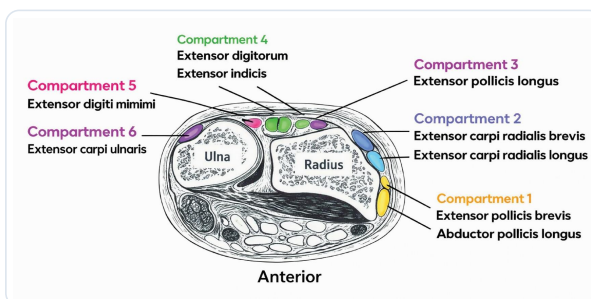
- OK
- D. Extensor pollicis brevis

## WHY THIS IS RIGHT

The extensor retinaculum at the wrist forms six osteofibrous compartments that transmit the extensor tendons. Fourth compartment contents:

- Extensor digitorum tendons
- Extensor indicis tendon
- Posterior interosseous nerve (terminal branch of radial nerve)

Extensor pollicis brevis is not present in the 4th compartment. It lies in the 1st extensor compartment along with abductor pollicis longus.



## QUESTION

A patient is unable to abduct his arm. Which of the following root values is likely to be affected?

A C4

B C5

CORRECT

C C6

D C7

## RIGHT ANSWER

OK

**B. C5**

## WHY THIS IS RIGHT

Abduction of the arm at the shoulder joint is mainly performed by two muscles with specific nerve root contributions.  
Muscles Responsible for Arm Abduction:

## 1. Supraspinatus

- Initiates the first 15° of abduction
- Innervated by suprascapular nerve
- Root values: C5-C6

## 2. Deltoid

- Responsible for 15°-90° of abduction
- Innervated by axillary nerve
- Root values: C5-C6

Although both muscles have C5-C6 supply, the dominant root for shoulder abduction is C5.

## QUESTION

A surgeon inadvertently injured the middle trunk of the brachial plexus while removing a Pancoast tumor. Which of the following nerve functions can be impaired?

A Medial pectoral nerve

B Nerve to subclavius

C Suprascapular nerve

D Thoracodorsal nerve

CORRECT

## RIGHT ANSWER

OK

D. Thoracodorsal nerve

## WHY THIS IS RIGHT

The middle trunk of the brachial plexus is formed by the anterior ramus of C7. Knowledge of which nerves ultimately carry C7 fibers helps predict deficits when this trunk is injured (e.g., during surgery for a Pancoast tumor at the lung apex).

The thoracodorsal nerve arises from the posterior cord and carries fibers from C6-C8 (especially C7). Therefore, injury to the middle trunk (C7) can impair the thoracodorsal nerve, affecting the latissimus dorsi muscle.

Function affected: Latissimus dorsi

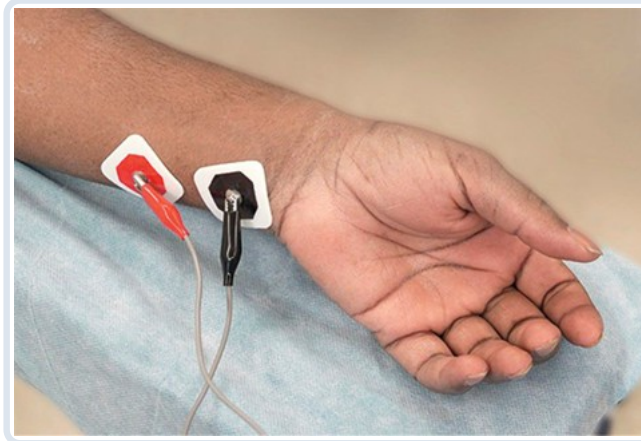
- Extension of the arm
- Adduction of the arm
- Medial rotation of the arm

Why Other Options Are Incorrect:

- Medial pectoral nerve -> arises from the medial cord (C8-T1).
- Nerve to subclavius -> arises from the upper trunk (C5-C6).
- Suprascapular nerve -> also arises from the upper trunk (C5-C6).

## QUESTION

During an anaesthesia procedure, neuromuscular monitoring was performed as shown in the image to assess recovery from a muscle relaxant. In this procedure, which of the following nerves is being tested?



A Median nerve

B Radial nerve

C Ulnar nerve

CORRECT

D Axillary nerve

RIGHT ANSWER

OK

C. Ulnar nerve

## WHY THIS IS RIGHT

Neuromuscular monitoring during anaesthesia commonly stimulates the ulnar nerve at the wrist, assessing contraction of the adductor pollicis muscle.

This is preferred because adductor pollicis has a reliable and consistent response to neuromuscular blockade and recovery.

Median, radial, and axillary nerves are not routinely used for standard intraoperative neuromuscular monitoring.



## QUESTION

A patient presents to the OPD with a spiral fracture of the shaft of the humerus. The X-ray findings are shown in the image. Which of the following nerves is most commonly injured in this condition?



A Median nerve

B Radial nerve

CORRECT

C Ulnar nerve

D Axillary nerve

RIGHT ANSWER

OK

B. Radial nerve

## WHY THIS IS RIGHT

In a spiral fracture of the shaft of the humerus, the radial nerve is most commonly injured because it runs in the radial (spiral) groove on the posterior surface of the humeral shaft.

Injury leads to wrist drop due to paralysis of wrist and finger extensors, along with sensory loss over the dorsum of the hand.

## QUESTION

| Which of the following root values are most commonly affected in this condition?



A C5, C6

CORRECT

B C6, C7

C C7, C8

D C8, T1

## RIGHT ANSWER

OK A. C5, C6

## WHY THIS IS RIGHT

This question refers to Erb's palsy, the most common type of brachial plexus injury, typically occurring due to excessive separation of the head and shoulder.

Because the injury occurs at C5-C6 roots, several nerves deriving from these roots are affected:

- Suprascapular nerve -> supraspinatus, infraspinatus
- Axillary nerve -> deltoid, teres minor
- Musculocutaneous nerve -> biceps brachii, brachialis
- Part of radial nerve (brachioradialis)

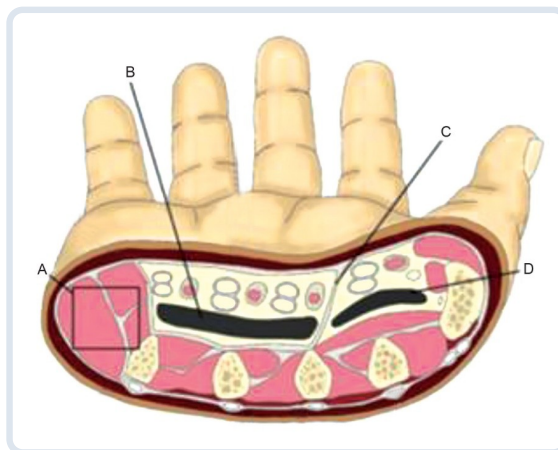
### Resulting deformity - "Waiter's tip posture"

Characteristic limb position:

- Arm adducted
- Medially rotated
- Elbow extended
- Forearm pronated

## QUESTION

A diabetic patient sustains a stab injury in the central area of the palm. After a few days, he develops swelling, pain, and inability to extend the middle and ring fingers. Pus accumulation is suspected in one of the palmar spaces. Which of the following spaces is most commonly involved?



A A

B B

CORRECT

C C

D D

RIGHT ANSWER

OK

B. B

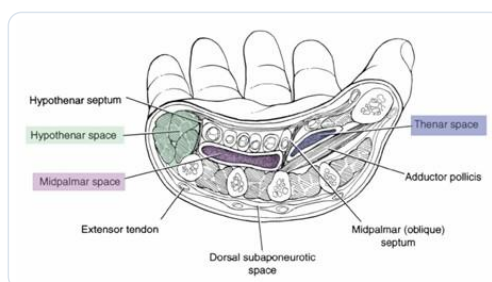
## WHY THIS IS RIGHT

The correct answer is Mid palmar space.

A stab injury in the central palm commonly leads to infection of the mid palmar space, which lies deep to the flexor tendons of the middle and ring fingers.

Pus in this space causes painful swelling and inability to extend the middle and ring fingers due to involvement of lumbricals and flexor tendon sheaths.

Thenar space affects thumb and index finger movements, while other palmar spaces are less commonly involved in central palm injuries.



## QUESTION

An elderly woman reports difficulty in buttoning her shirt and increased clumsiness in performing daily activities. On examination, the clinician asked her to make an 'O' using her thumb and index finger, which she was unable to do. Which of the following muscles is involved?

A Palmar interossei

B Opponens pollicis

C Flexor pollicis longus

CORRECT

D Abductor pollicis brevis

## RIGHT ANSWER

OK

C. Flexor pollicis longus

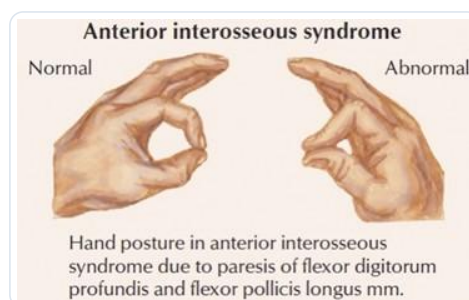
## WHY THIS IS RIGHT

Inability to make an "O" sign indicates weakness of flexion at the interphalangeal joint of the thumb, which is the primary action of flexor pollicis longus.

This muscle is supplied by the anterior interosseous nerve (median nerve branch), and its paralysis produces the classic positive pinch sign.

Opponens pollicis and abductor pollicis brevis mediate opposition and abduction, while palmar interossei act on digits, not the thumb IP joint.

\*



## QUESTION

A patient complains of decreased sensation in the lateral 3 ½ fingers of the palmar side of the right hand along with difficulty moving the upper phalanx of the thumb. Associated thenar atrophy is also present. What is the associated nerve injury in this case?

- A Ulnar nerve
- B Radial nerve
- C Anterior interosseous nerve
- D High median nerve**

CORRECT

## RIGHT ANSWER

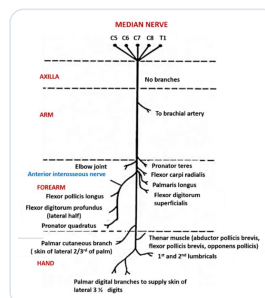
- OK
- D. High median nerve**

## WHY THIS IS RIGHT

Sensory loss over the lateral 3½ fingers (palmar side) with thenar muscle atrophy indicates a proximal median nerve lesion.

Difficulty moving the upper phalanx of the thumb reflects weakness of thenar muscles (OP, APB, FPB) supplied by median nerve.

Ulnar and radial nerves have different sensory distributions, while anterior interosseous nerve is purely motor and spares sensation and thenar eminence.



## QUESTION

A patient presents with shoulder pain following a hyperextension injury during exercise. On examination, there is evidence of avulsion of the long head of the triceps. What is the site of avulsion of triceps?

- A Shaft of humerus
- B Supraglenoid tubercle
- C Infraglenoid tubercle**
- D Deltoid tuberosity of humerus

CORRECT

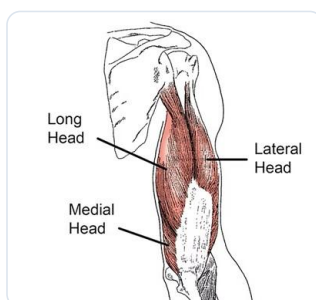
## RIGHT ANSWER

- OK
- C. Infraglenoid tubercle**

## WHY THIS IS RIGHT

The long head of triceps brachii originates from the infraglenoid tubercle of the scapula, crossing the shoulder joint. A hyperextension injury can avulse this tendon at its origin.

The shaft of humerus gives origin to the lateral and medial heads, supraglenoid tubercle is for the long head of biceps, and deltoid tuberosity is for deltoid insertion.



## QUESTION

Match the following muscles with their action at shoulder joint:

| Muscle                             | Action                            |
|------------------------------------|-----------------------------------|
| A. Latissimus dorsi                | 1. Flexion                        |
| B. Supraspinatus                   | 2. Extension with medial rotation |
| C. Infraspinatus                   | 3. Abduction                      |
| D. Pectoralis Major (sternal head) | 4. Lateral rotation               |

A A-4, B-3, C-2, D-1

B A-4, B-2, C-3, D-1

C A-2, B-1, C-4, D-3

D A-2, B-3, C-4, D-1

CORRECT

## RIGHT ANSWER

OK D. A-2, B-3, C-4, D-1

## WHY THIS IS RIGHT

Latissimus dorsi produces extension with medial rotation of the shoulder, while supraspinatus initiates abduction (first 15°).

Infraspinatus is a primary lateral rotator of the shoulder, and the sternal head of pectoralis major causes flexion and adduction of the humerus.

## QUESTION

## | Posterior interosseous nerve injury causes?

**A** Loss of extension at finger

CORRECT

**B** Loss of supination**C** Loss of extension of wrist**D** Wrist drop

## RIGHT ANSWER

OK

**A. Loss of extension at finger**

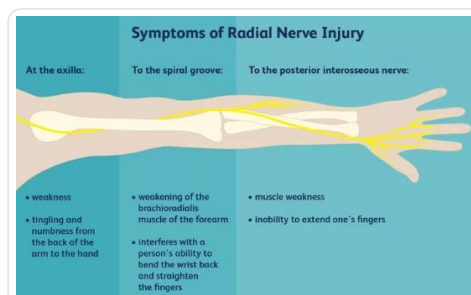
## WHY THIS IS RIGHT

The correct answer is loss of extension at fingers.

The posterior interosseous nerve (deep branch of radial nerve) supplies the finger and thumb extensors.

Wrist extension is largely preserved due to extensor carpi radialis longus and brevis, so wrist drop does not occur.

Supination is mainly by biceps brachii and supinator, which are not significantly affected.





## QUESTION

Which of the following muscles are supplied by the deep branch of the ulnar nerve?

1. 3rd lumbrical
2. 4th Dorsal interossei
3. Opponens digiti minimi
4. Flexor carpi ulnaris

A 1, 2, 3

CORRECT

B 2, 3, 4

C 1, 3, 4

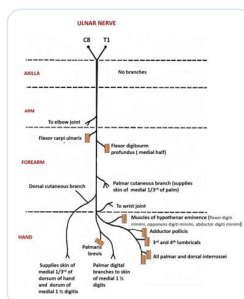
D 1, 2, 3, 4

## RIGHT ANSWER

OK A. 1, 2, 3

## WHY THIS IS RIGHT

The ulnar nerve divides into superficial and deep branches as it enters the hand. The deep branch of the ulnar nerve is responsible for supplying most of the intrinsic muscles of the hand.



## QUESTION

All of the following peritoneal folds are correctly matched with their contents, except:

**A** Gastrocolic ligament - Right gastric artery

CORRECT

**B** Splenorenal ligament - Splenic vessels and pancreatic tail

**C** Transverse mesocolon - Middle colic vessels

**D** Gastrosplenic ligament - Short gastric vessels

## RIGHT ANSWER

**OK** A. Gastrocolic ligament - Right gastric artery

## WHY THIS IS RIGHT

Peritoneal ligaments are double layers of peritoneum connecting abdominal organs and usually transmit specific vessels, nerves, or ducts between them. Knowing their contents is important for abdominal surgery and imaging.

Key peritoneal folds and their contents:

- Gastrocolic ligament - Part of the greater omentum connecting the greater curvature of the stomach to the transverse colon. It mainly contains gastroepiploic (gastro-omental) vessels, not the right gastric artery.
- Splenorenal (lienorenal) ligament - Connects the spleen to the left kidney and contains the splenic vessels and the tail of the pancreas.
- Transverse mesocolon - Suspends the transverse colon from the posterior abdominal wall and contains the middle colic vessels.
- Gastrosplenic ligament - Connects the stomach to the spleen and contains the short gastric vessels and left gastroepiploic vessels.

## QUESTION

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

- A Bulbospongiosus muscle
- B Superficial transverse perineal muscles
- C Deep transverse perineal muscles
- D Internal anal sphincter muscle

CORRECT

## RIGHT ANSWER

- OK
- D. Internal anal sphincter muscle

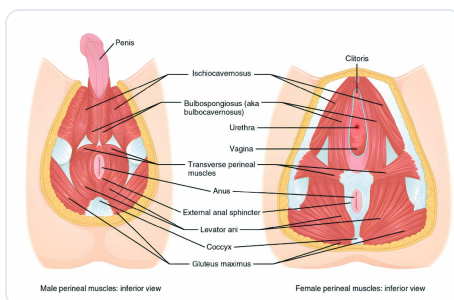
## WHY THIS IS RIGHT

The perineal body (central tendon of the perineum) is a fibromuscular node located between the urogenital triangle and anal triangle, anterior to the anus. It serves as an important point of attachment for several perineal muscles that support the pelvic floor and maintain pelvic organ stability.

Muscles attached to the perineal body include:

- Bulbospongiosus muscle
- Superficial transverse perineal muscle
- Deep transverse perineal muscle
- External anal sphincter
- Fibers of levator ani (especially pubococcygeus)

The internal anal sphincter is not attached to the perineal body because it is a smooth muscle continuation of the circular layer of the rectum and functions involuntarily.



## QUESTION

| Which of the following statements is true about the iliopubic tract?

- A** It is a thickening of the lumbar fascia
- B** It lies anterior to the Poupart's ligament
- C** It inserts into the pubic tubercle in front of the conjoint tendon
- D** Its fibers fan out with fascia illaca laterally

CORRECT

## RIGHT ANSWER

- OK** **D. Its fibers fan out with fascia illaca laterally**

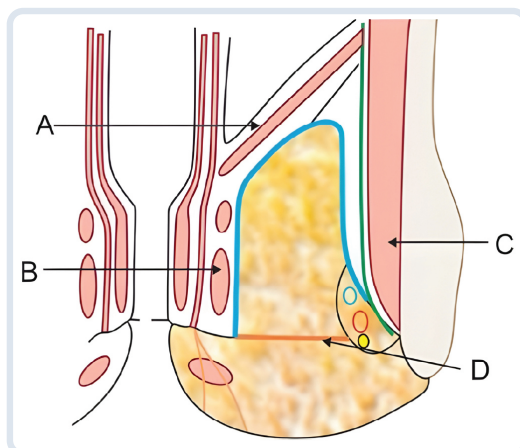
## WHY THIS IS RIGHT

The iliopubic tract is a thickened band of the transversalis fascia that runs parallel and posterior (deep) to the inguinal ligament (Poupart's ligament). It extends from the anterior superior iliac spine (ASIS) to the pubic tubercle and laterally blends with the iliac fascia (fascia iliaca).

It forms the inferior margin of the deep inguinal ring and contributes to the posterior wall of the inguinal canal, making it an important structure in inguinal hernia anatomy and repair (e.g., laparoscopic hernia repair landmarks).

## QUESTION

**I All of the following are true about structure marked A except:**



**A** Supplied by sacral nerves S3 and S4 and pudendal nerve.

**B** Converge downwards and medially

**C** Consists of iliococcygeus and pubococcygeus

**D Attached to pelvic brim**

CORRECT

## RIGHT ANSWER

OK

**D. Attached to pelvic brim**

## WHY THIS IS RIGHT

The marked structure A represents the levator ani muscle, the major component of the pelvic diaphragm, which supports pelvic organs and maintains continence.

The levator ani consists of:

- Pubococcygeus
- Iliococcygeus
- (Often also includes puborectalis)
- Innervation: Branches from S3-S4 and the pudendal nerve
- Direction of fibers: Run downward and medially to form a sling around pelvic viscera
- Function:
  - Supports pelvic organs
  - Maintains fecal and urinary continence
  - Important during childbirth and defecation
- Levator ani arises from:
  - Body of pubis
  - Tendinous arch of obturator fascia
  - Ischial spine

It is not attached to the pelvic brim. The pelvic brim is related to the pelvic inlet, not the levator ani.

## QUESTION

A 63-year-old man presents with epigastric pain radiating to the back and steatorrhea. CT shows a pancreatic head carcinoma compressing the gastroduodenal artery. Over the next few days, the patient develops duodenal ischemia. Which of the following arteries most directly loses its blood flow due to this compression?

A Inferior pancreaticoduodenal artery

B Superior pancreaticoduodenal artery

CORRECT

C Left gastroepiploic artery

D Dorsal pancreatic artery

## RIGHT ANSWER

OK B. Superior pancreaticoduodenal artery

## WHY THIS IS RIGHT

The gastroduodenal artery (GDA) is a branch of the common hepatic artery and supplies the stomach, pancreas, and proximal duodenum. Key branches of the gastroduodenal artery:

- Superior pancreaticoduodenal artery (anterior and posterior branches)
- Right gastroepiploic artery

The superior pancreaticoduodenal artery supplies the proximal duodenum and head of the pancreas and forms an important anastomosis with the inferior pancreaticoduodenal artery (branch of the superior mesenteric artery). Compression of the gastroduodenal artery by a pancreatic head tumor directly reduces blood flow to the superior pancreaticoduodenal artery, leading to duodenal ischemia.

Other options:

- Inferior pancreaticoduodenal artery: arises from the SMA.
- Left gastroepiploic artery: branch of the splenic artery.
- Dorsal pancreatic artery: usually from the splenic artery.

## QUESTION

| Which of the following statements concerning the liver are correct, EXCEPT:

A

Quadrate lobe drains into the right hepatic duct

CORRECT

B

The lesser omentum suspends the stomach from the visceral surface of the liver

C

Attachment of the hepatic veins to the IVC is the most important support of the liver

D

The ligamentum venosum is attached to the left branch of the portal vein in the porta hepatis

## RIGHT ANSWER

OK

A. Quadrate lobe drains into the right hepatic duct

## WHY THIS IS RIGHT

The quadrate lobe of the liver belongs functionally to the left lobe based on its vascular supply and biliary drainage.

Key anatomical facts:

- Quadrate lobe drains into the left hepatic duct, not the right hepatic duct.
- The lesser omentum (hepatogastric and hepatoduodenal ligaments) connects the liver to the stomach and proximal duodenum.
- The hepatic veins draining into the inferior vena cava (IVC) provide the most important structural support of the liver, anchoring it to the diaphragm and posterior abdominal wall.
- The ligamentum venosum (remnant of the fetal ductus venosus) lies between the left lobe and caudate lobe and attaches near the left branch of the portal vein at the porta hepatis.

Therefore, the incorrect statement is that the quadrate lobe drains into the right hepatic duct.

## QUESTION

A 38-year-old banker with a history of chronic heartburn suddenly experiences excruciating pain in the epigastric region of the abdomen. Emergency surgery is performed upon admission. Intraoperative findings reveal a ruptured ulcer located on the posterior wall of the stomach. Where will a surgeon first expect to find leaked stomach contents?

- A Greater peritoneal sac
- B Cul-de-sac of Douglas (rectouterine pouch)
- C Omental bursa**
- D Paracolic gutter

CORRECT

## RIGHT ANSWER

- OK **C. Omental bursa**

## WHY THIS IS RIGHT

The posterior wall of the stomach lies directly anterior to the lesser sac (omental bursa), a subdivision of the peritoneal cavity. When a posterior gastric ulcer perforates, the gastric contents first enter the lesser sac (omental bursa) rather than the greater sac.

Anatomical relationships:

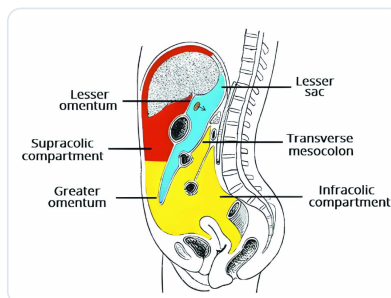
- Anterior stomach wall -> greater sac
- Posterior stomach wall -> lesser sac (omental bursa)

Boundaries of the lesser sac:

- Anterior: stomach and lesser omentum
- Posterior: pancreas and posterior abdominal wall
- Communication with greater sac: through the epiploic (omental) foramen of Winslow

Other options:

- Greater peritoneal sac: involved in anterior gastric perforation.
- Cul-de-sac of Douglas: lowest peritoneal recess in females.
- Paracolic gutters: channels that allow spread of peritoneal fluid later.





## QUESTION

**| Which of the following is false about Anatomy of Adrenal gland?**

- A** Adrenals are yellow in gross appearance
- B** Retroperitoneal in location
- C** **Right adrenal is semilunar in shape**
- D** Left adrenal is related medially to coeliac ganglion

CORRECT

## RIGHT ANSWER

OK

**C. Right adrenal is semilunar in shape**

## WHY THIS IS RIGHT

The adrenal (suprarenal) glands are paired endocrine glands located in the retroperitoneum on the superior poles of the kidneys.

- Color: Adrenal glands appear yellowish due to their high lipid content, especially in the cortex.
- Location: They are retroperitoneal structures situated within the renal fascia above the kidneys.
- Shape difference:
  - Right adrenal gland -> Pyramidal/triangular in shape.
  - Left adrenal gland -> Semilunar (crescentic) in shape.

Important Relations:

- The left adrenal gland is medially related to the coeliac ganglion and coeliac trunk.
- The right adrenal gland is related anteriorly to the inferior vena cava and liver.

Option C states that the right adrenal is semilunar, which is incorrect. The semilunar shape belongs to the left adrenal gland, while the right adrenal gland is pyramidal.

## QUESTION

Which nerve is affected when there is referred pain from ureteric colic felt in the groin?

- A Subcostal
- B Iliohypogastric
- C Ilioinguinal

**D Genitofemoral**

CORRECT

## RIGHT ANSWER

**D. Genitofemoral**

## WHY THIS IS RIGHT

Pain from ureteric colic is transmitted via sympathetic afferent fibers accompanying T11-L2 spinal segments. As the stone descends in the ureter, pain is referred along dermatomes supplied by these nerves.

Referred pain pattern:

- Upper ureter -> flank (T11-T12)
- Mid ureter -> lower abdomen
- Lower ureter -> groin, scrotum, or labia majora

This groin pain occurs because the genitofemoral nerve (L1-L2) supplies the skin of the upper anterior thigh and genital region, producing referred pain in the groin during ureteric colic.

- Origin: L1-L2 lumbar plexus
- Divides into:
  - o Genital branch -> scrotum/labia majora, cremaster muscle
  - o Femoral branch -> skin of upper anterior thigh

## QUESTION

A 65-year-old male presents with urinary retention and pelvic discomfort. A digital rectal examination reveals an enlarged prostate gland. During surgery to relieve the obstruction, the urologist must take care to avoid damaging the structures that separate the prostate from the rectum. Which of the following structures separates the prostate gland from the rectum?

A Waldeyer's fascia

B Scarpa's fascia

C Denonvilliers' fascia

CORRECT

D Camper's fascia

## RIGHT ANSWER

OK C. Denonvilliers' fascia

## WHY THIS IS RIGHT

The prostate gland lies anterior to the rectum, and the structure separating them is the Denonvilliers' fascia (rectoprostatic fascia). Key features of Denonvilliers' fascia:

- A fibrous fascial layer between the prostate/seminal vesicles anteriorly and the rectum posteriorly.
- Provides an important surgical plane during prostatectomy.
- Helps prevent direct spread of prostatic carcinoma to the rectum.

Other options:

- Waldeyer's fascia: fascia related to the sacral region behind the rectum.
- Scarpa's fascia: deep membranous layer of superficial fascia of the anterior abdominal wall.
- Camper's fascia: fatty superficial layer of the anterior abdominal wall.

## QUESTION

A 45 y/o male patient presents with abdominal pain and distension. A CT scan reveals multiple appendices epiploicae, particularly prominent in the sigmoid colon. Which of the following statements regarding the anatomy of the large intestine is false?

**A** The caecum is typically 8-10 cm long and is a common site for appendices epiploicae.

CORRECT

**B** The sigmoid colon, which is S-shaped, leads directly into the rectum.

**C** The total length of the large intestine in adults ranges from 1 to 1.5 meters.

**D** Appendices epiploicae are more common in the distal colon.

## RIGHT ANSWER

OK

**A. The caecum is typically 8-10 cm long and is a common site for appendices epiploicae.**

## WHY THIS IS RIGHT

Appendices epiploicae are fat-filled peritoneal pouches attached to the outer surface of the colon. Key anatomical features:

- They are most numerous in the transverse and sigmoid colon.
- They are rare or absent in the cecum, appendix, and rectum.
- They can become inflamed, leading to epiploic appendagitis, which may mimic appendicitis or diverticulitis.

Large intestine facts:

- Length: about 1-1.5 meters in adults.
- Sigmoid colon: S-shaped and continues into the rectum.
- Appendices epiploicae are more common in the distal colon, especially the sigmoid colon.

Therefore, the false statement is that the cecum is a common site for appendices epiploicae.

## QUESTION

**| Level of posterior superior iliac spine:****A** L5**B** S1**C** S2

CORRECT

**D** S3

## RIGHT ANSWER

**OK** C. S2

## WHY THIS IS RIGHT

The posterior superior iliac spine (PSIS) is an important surface anatomical landmark on the posterior pelvis. It is visible externally as the “dimples of Venus” in the lower back.

The PSIS corresponds approximately to the level of the second sacral vertebra (S2).

The S2 vertebral level is important because it corresponds to:

- Termination of the dural sac
- End of the subarachnoid space
- A landmark used in caudal epidural anesthesia

Other related landmarks:

- Iliac crest line (Tuffier's line) -> level of L4 vertebra
- Sacral hiatus -> around S4

## QUESTION

| Which of the following statements about the ligament of Treitz is not true?

**A** It connects the duodenojejunal flexure to the right crus of the diaphragm.

**B** It contains striated muscle fibers in its upper part.

**C** It primarily serves as a conduit for blood supply to the small intestine.

CORRECT

**D** It acts as a landmark in the diagnosis of intestinal malrotation.

## RIGHT ANSWER

**OK** C. It primarily serves as a conduit for blood supply to the small intestine.

## WHY THIS IS RIGHT

The ligament of Treitz (suspensory ligament of the duodenum) supports the duodenojejunal flexure and marks the transition between the duodenum and jejunum.

- Origin: Right crus of the diaphragm
- Insertion: Duodenojejunal flexure
- Structure: Contains striated muscle fibers superiorly (from diaphragm) and smooth muscle inferiorly (from duodenum).
- Function: Helps maintain the angle of the duodenojejunal junction and supports the small intestine.

Clinical importance:

- Serves as an important anatomical landmark to distinguish upper vs lower gastrointestinal bleeding.
- Used to identify intestinal malrotation in imaging and surgery.

The incorrect statement is that it serves as a conduit for blood supply, because mesenteric vessels supply the small intestine, not the ligament of Treitz.

## QUESTION

| Which of the following spermatic cord structures is not harmed during vasectomy?

A Testicular artery

B Ilioinguinal nerve

CORRECT

C Autonomic nerves

D Pampiniform plexus

## RIGHT ANSWER

OK B. Ilioinguinal nerve

## WHY THIS IS RIGHT

A vasectomy is a sterilization procedure in which the vas deferens is ligated and cut within the spermatic cord to prevent sperm from reaching the ejaculate.

The spermatic cord contains:

- Vas deferens
- Testicular artery
- Pampiniform venous plexus
- Autonomic nerve fibers (testicular plexus)
- Cremasteric artery
- Genital branch of genitofemoral nerve
- Lymphatics

During vasectomy, the vas deferens is isolated, and care is taken to avoid injury to adjacent vessels and nerves.

Structure not harmed:

- Ilioinguinal nerve runs in the inguinal canal but lies outside the spermatic cord.
- Therefore, it is not part of the spermatic cord contents and is not directly involved in vasectomy.

## QUESTION

A 44 year old female presents to the OPD with high grade fever, pain that is constant, throbbing, and worse when sitting down with history of constipation in the past. Fluctuation is noted near the anal region. The Resident decides to drain the ischioanal abscess. Which of the following structures can be injured while draining the ischioanal abscess?

**A** Inferior rectal nerve

CORRECT

**B** Pudendal nerve

**C** Internal pudendal artery

**D** Posterior labial nerve

## RIGHT ANSWER

**OK** A. Inferior rectal nerve

## WHY THIS IS RIGHT

An ischioanal (ischiorectal) abscess occurs in the ischioanal fossa, a fat-filled space on either side of the anal canal that allows expansion during defecation. Surgical drainage of this abscess risks injury to structures passing through this space.

Boundaries of the ischioanal fossa:

- Medial: External anal sphincter and levator ani
- Lateral: Obturator internus muscle and obturator fascia
- Posterior: Sacrotuberous ligament and gluteus maximus
- Anterior: Extends into anterior recess

Important contents:

- Ischioanal fat
- Inferior rectal (anal) nerve
- Inferior rectal vessels

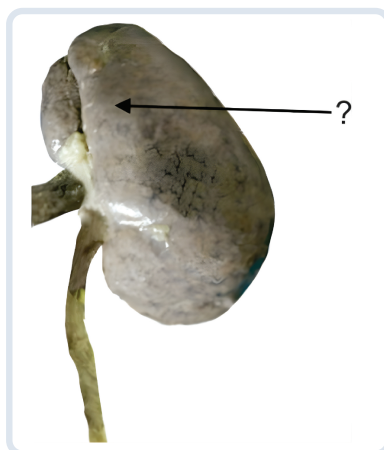
During incision and drainage of an ischioanal abscess, the inferior rectal nerve may be injured, potentially causing:

- Weakness of external anal sphincter
- Fecal incontinence
- Loss of perianal sensation



## QUESTION

Which of the following is related to the marked area in the image?



A Stomach

CORRECT

B Spleen

C 2nd part of duodenum

D Pancreas

## RIGHT ANSWER

OK

A. Stomach

## WHY THIS IS RIGHT

The marked area in the image corresponds to the gastric impression on the anterior surface of the left kidney. The left kidney has several important anterior relations due to its position in the upper abdomen. These relations produce distinct impressions on the anterior surface of the kidney.

## Important Anterior Relations of the Left Kidney

- Stomach -> forms the gastric impression on the upper medial anterior surface.
- Spleen -> produces the splenic impression on the upper lateral part.
- Pancreas (body) -> lies anterior to the central region of the kidney.
- Left colic flexure and jejunum -> related to the inferior portion.

## QUESTION

A patient presented to OPD with abdominal pain, jaundice, and portal hypertension. With the above symptoms identify the anastomosis seen in between veins.

**A** Esophageal veins and left gastric veins

CORRECT

**B** Left colic vein and middle colic veins

**C** Superior rectal and phrenic veins

**D** Sigmoid and superior rectal veins

## RIGHT ANSWER

**OK** A. Esophageal veins and left gastric veins

## WHY THIS IS RIGHT

In the given scenario of a patient with portal hypertension, anastomosis between esophageal veins and left gastric veins can be seen. In portal hypertension, increased pressure within the portal venous system may result in the dilation of portal venous tributaries and reversed flow at sites of portosystemic anastomoses.

## QUESTION

The fibres of the internal oblique muscle and transversus abdominus muscle contribute to which boundaries of the inguinal canal walls?

- i. Anterior wall
- ii. Roof
- iii. Floor
- iv. Posterior wall

**A** ii and iv.

CORRECT

**B** i, ii, and iv.

**C** i and iii.

**D** iii and iv.

RIGHT ANSWER

OK

**A. ii and iv.**

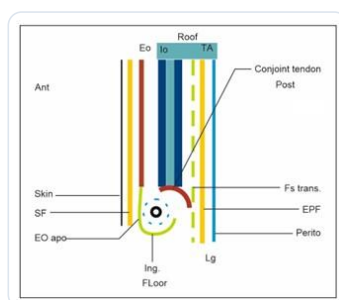
## WHY THIS IS RIGHT

The correct answer is ii and iv (Roof and posterior wall).

Fibers of internal oblique and transversus abdominis arch over the spermatic cord, forming the roof of the inguinal canal.

Their aponeurotic fusion forms the conjoint tendon, which reinforces the posterior wall medially.

Anterior wall is mainly external oblique aponeurosis, and the floor is formed by the inguinal ligament, not by these muscles.



## QUESTION

| Which of the following is false regarding the anatomy of the adrenal glands?

CORRECT

- A** The right adrenal gland is semi-lunar in shape
- B** The left adrenal gland is closely related with the tail of pancreas and spleen.
- C** The adrenal is yellow on gross appearance.
- D** The adrenal is retroperitoneal in location.

## RIGHT ANSWER

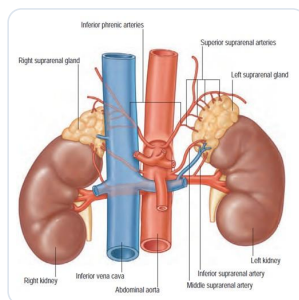
OK

**A. The right adrenal gland is semi-lunar in shape**

## WHY THIS IS RIGHT

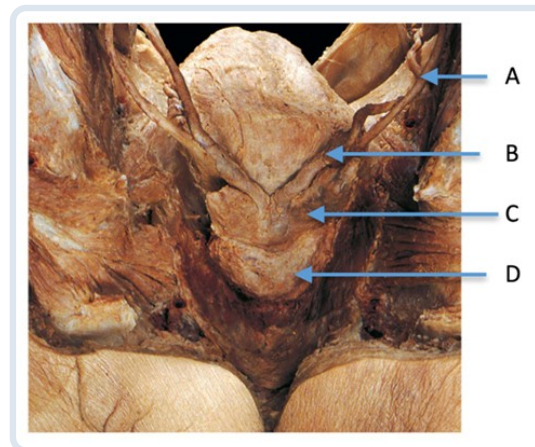
The right adrenal gland is pyramidal (triangular) in shape, while the left adrenal gland is semilunar, making option incorrect.

The left adrenal is related to the tail of pancreas and spleen, both adrenals are yellow due to lipid-rich cortex, and they are retroperitoneal, all of which are true statements.



## QUESTION

Match the following in the given image below:



**A** A-prostate, B-ureter, C-vas deferens, D-seminal vesicle

**B** A-vas deferens, B-ureter, C-prostate, D-seminal vesicle

**C** **A-ureter, B-vas deferens, C-seminal vesicle, D-prostate**

CORRECT

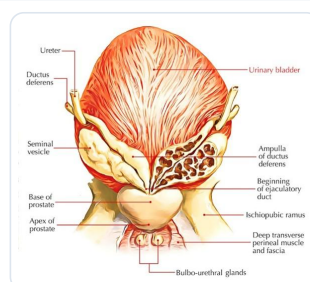
**D** A-vas deferens, B-ureter, C-prostate, D-seminal vesicle

## RIGHT ANSWER

**OK** C. A-ureter, B-vas deferens, C-seminal vesicle, D-prostate

## WHY THIS IS RIGHT

This cadaveric image shows the posterior surface of the urinary bladder with its related structures.



## QUESTION

| Which of the following is not the boundary of hepatocystic triangle?

A Common hepatic duct

B Inferior border of liver

C Cystic duct

D Cystic artery

CORRECT

## RIGHT ANSWER

OK

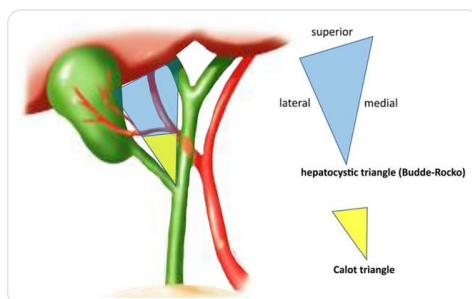
D. Cystic artery

## WHY THIS IS RIGHT

The hepatocystic triangle (also called hepatobiliary triangle) is an important surgical landmark used during cholecystectomy and other biliary procedures. The boundaries of the hepatocystic triangle are:

- Superior border (base): Inferior border of the liver
- Right border: Cystic duct
- Left border: Common hepatic duct

The cystic artery is not a boundary of the hepatocystic triangle but rather passes through it as content. The cystic artery typically runs within this triangular space and is an important structure that needs to be identified and ligated during cholecystectomy.



## QUESTION

| The structure marked in the image is embedded in which of the following structures?



A Medial head of gastrocnemius

B Lateral head of gastrocnemius

CORRECT

C Popliteal artery

D Adductor longus

## RIGHT ANSWER

OK

B. Lateral head of gastrocnemius

## WHY THIS IS RIGHT

The marked structure on the lateral knee X-ray is the fabella, a sesamoid bone located in the tendon of the lateral head of the gastrocnemius muscle.

- Location: Posterior aspect of the knee, behind the lateral femoral condyle
- Embedded in: Tendon of the lateral head of gastrocnemius
- Type: Sesamoid bone (similar concept to the patella)
- Acts like other sesamoid bones by:
  - Reducing friction
  - Protecting the tendon
  - Improving the mechanical advantage of the muscle

## Clinical relevance

- Present in 10-30% of individuals
- Can cause fabella syndrome -> posterolateral knee pain due to irritation or compression against the femoral condyle.

## QUESTION

An 82-year-old woman is sent to the hospital from a nursing home after 2 days of fever, confusion, and lethargy. The patient has a history of mild dementia, hypertension, and osteoarthritis. Her temperature is 38.8°C (102°F), blood pressure is 90/60 mmHg, and pulse is 116/min. She has mild suprapubic and right costovertebral angle tenderness. Her leukocyte count is 18,000/mm<sup>3</sup>, and urinalysis is consistent with acute cystitis. A femoral venous access is planned for administration of intravenous fluids and antibiotics. The femoral artery pulsation is palpable immediately below the inguinal ligament. Which of the following describes the optimal cannulation site for the femoral vein?

- A Immediately lateral to the femoral artery
- B Immediately medial to the femoral artery**
- C Midway between the iliac crest and the femoral artery
- D Superior and medial to the pubic tubercle

CORRECT

## RIGHT ANSWER

- B. Immediately medial to the femoral artery**

## WHY THIS IS RIGHT

The femoral vein lies medial to the femoral artery within the femoral triangle, just inferior to the inguinal ligament. Therefore, when the femoral artery pulse is palpated, the optimal site for femoral venous cannulation is immediately medial to the artery.

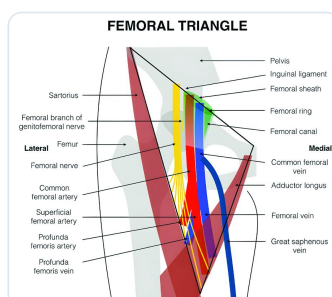
Arrangement of structures in the femoral triangle (lateral -> medial)

NAVEL mnemonic:

- N - Femoral Nerve
- A - Femoral Artery
- V - Femoral Vein
- E - Empty space (femoral canal)
- L - Lymphatics

Clinical correlation

- Femoral venous access is used in shock, sepsis, or emergency resuscitation when rapid central access is needed.
- The needle is inserted just medial to the palpable femoral artery pulse below the inguinal ligament to access the femoral vein safely.





## QUESTION

During dissection of the posterior leg compartment, a medical student encounters a long, thin structure extending from the lateral supracondylar ridge of the femur all the way down to the calcaneus. Because of its slender appearance, it is often mistaken for a nerve (called freshman's nerve). Which muscle has the longest tendon in the body?

A Gastrocnemius

B Soleus

C **Plantaris**

CORRECT

D Tibialis posterior

## RIGHT ANSWER

OK **C. Plantaris**

## WHY THIS IS RIGHT

The plantaris muscle is a small muscle of the posterior compartment of the leg known for having the longest tendon in the human body.

- Origin: Lateral supracondylar line of the femur
- Insertion: Posterior surface of the calcaneus (often via the Achilles tendon)
- Tendon: Very long and thin, extending from the knee to the heel

Because of its slender tendon, it is often called the "freshman's nerve", as it can be mistaken for a nerve during dissection.

Function:

- Weak plantar flexion of the ankle
- Weak flexion of the knee

The plantaris tendon is sometimes harvested for tendon grafts because its removal has minimal functional effect.

## QUESTION

A 16-year-old boy was diagnosed with urethral stricture. He underwent visual internal urethrotomy in the lithotomy position with stirrups supporting both popliteal fossa and proximal parts of tibia. No ankle support was used. On the first postoperative day, the patient complained of decreased sensation on the lateral aspect of right leg, the lateral border of his right foot and difficulty in dorsiflexion of the right foot due to compression of a particular nerve of the lower limb. Which of the following muscles is supplied by the nerve involved in this scenario?

A Flexor Hallucis Longus

B Abductor Hallucis

C Extensor Digitorum Longus

CORRECT

D Semi-Membranosus

## RIGHT ANSWER

OK

C. Extensor Digitorum Longus

## WHY THIS IS RIGHT

Compression at the popliteal region or fibular neck in the lithotomy position can injure the common peroneal (fibular) nerve, which is particularly vulnerable where it winds around the neck of the fibula.

Clinical features of common peroneal nerve injury:

- Foot drop due to loss of dorsiflexion
- Weak toe extension
- Sensory loss over:
  - Lateral leg
  - Dorsum of foot
  - Lateral border of foot

The common peroneal nerve divides into:

1\). Deep peroneal nerve (anterior compartment):

- Tibialis anterior
- Extensor hallucis longus
- Extensor digitorum longus
- Fibularis tertius

These muscles perform dorsiflexion of the foot and extension of toes.

2\). Superficial peroneal nerve (lateral compartment):

- Fibularis longus
- Fibularis brevis

## QUESTION

A 56-year-old man with peripheral arterial disease undergoes femoral arterial catheterization for angiography. After passing the catheter through the femoral artery and advancing distally, the interventional radiologist notes that the artery disappears from the anterior medial thigh view on fluoroscopy and reappears in the popliteal fossa without forming a visible collateral branch in between. Which anatomical structure has the catheter just traversed?

A Adductor longus tendon

B Femoral triangle

C Adductor hiatus in the adductor magnus

CORRECT

D Vastoadductor membrane

## RIGHT ANSWER

OK C. Adductor hiatus in the adductor magnus

## WHY THIS IS RIGHT

The femoral artery travels through the anterior and medial thigh and enters the popliteal fossa after passing through the adductor hiatus. Adductor hiatus:

- An opening in the tendon of the adductor magnus muscle.
- Located at the distal end of the adductor canal.
- Allows the femoral artery and vein to pass from the anterior thigh to the posterior knee region.

After passing through the adductor hiatus:

- Femoral artery -> becomes the popliteal artery in the popliteal fossa.

Other structures:

- Femoral triangle: proximal region where the femoral vessels first enter the thigh.
- Adductor longus tendon: forms part of the medial boundary of the femoral triangle.
- Vastoadductor membrane: covers the adductor canal but is not the opening where the artery exits.

## QUESTION

Following statements concerning the structures that leave the pelvis are correct, except:

- A** The sciatic nerve leaves the pelvis through the greater sciatic foramen
- B** The piriformis muscle leaves the pelvis through the greater sciatic foramen
- C** The external iliac artery passes beneath the inguinal ligament to become the femoral artery
- D** The obturator nerve leaves the pelvis through the lesser sciatic foramen

CORRECT

## RIGHT ANSWER

- OK** D. The obturator nerve leaves the pelvis through the lesser sciatic foramen

## WHY THIS IS RIGHT

Several important nerves, muscles, and vessels exit the pelvis through specific foramina or openings.

- Sciatic nerve: leaves the pelvis through the greater sciatic foramen (below the piriformis muscle).
- Piriformis muscle: exits the pelvis through the greater sciatic foramen and divides it into suprapiriform and infrapiriform compartments.
- External iliac artery: passes beneath the inguinal ligament to become the femoral artery in the thigh.
- Obturator nerve: leaves the pelvis through the obturator canal, not the lesser sciatic foramen.

Lesser sciatic foramen transmits:

- Pudendal nerve
- Internal pudendal vessels
- Nerve to obturator internus
- Tendon of obturator internus

Therefore, the incorrect statement is that the obturator nerve leaves through the lesser sciatic foramen.

## QUESTION

A 45-year-old male undergoes ligation of the femoral artery proximal to the profunda femoris due to trauma. Despite this, blood supply to the distal femur remains adequate through collateral circulation around the hip. Which arterial network is most responsible for restoring blood flow in this situation?

A Trochanteric anastomosis

B **Cruciate anastomosis**

CORRECT

C Genicular anastomosis

D Obturator arcade

## RIGHT ANSWER

OK **B. Cruciate anastomosis**

## WHY THIS IS RIGHT

The cruciate anastomosis is an important arterial network around the upper thigh that provides collateral circulation when the femoral artery is occluded proximal to the profunda femoris. It is located in Posterior aspect of the upper femur near the lesser trochanter.

Arteries forming the cruciate anastomosis:

- Transverse branch of medial circumflex femoral artery
- Transverse branch of lateral circumflex femoral artery
- Ascending branch of the first perforating artery (from profunda femoris)
- Descending branch of the inferior gluteal artery

Allows blood from the internal iliac artery (via inferior gluteal artery) to reach the profunda femoris and distal femoral circulation when the femoral artery is ligated above the profunda femoris.

Other networks:

- Trochanteric anastomosis: mainly supplies the head and neck of the femur.
- Genicular anastomosis: around the knee joint.
- Obturator arcade: related to pelvic circulation.

## QUESTION

A 30 y/o athlete reports sudden pain in the back of his left leg and an inability to push off the ground while sprinting. Examination reveals a significant weakness in plantar flexion. Which muscle is primarily responsible for the action of Plantar flexion in this patient?

A Tibialis Anterior

B Gastrocnemius

CORRECT

C Tibialis Posterior

D Fibularis Longus

## RIGHT ANSWER

OK

B. Gastrocnemius

## WHY THIS IS RIGHT

Plantar flexion of the ankle is mainly produced by the gastrocnemius and soleus muscles, which together form the triceps surae.

Gastrocnemius:

- Origin: Medial and lateral condyles of the femur
- Insertion: Calcaneus via the Achilles (calcaneal) tendon
- Actions:

- o Powerful plantar flexion of the foot
- o Flexion of the knee

Clinical relevance:

- Sudden pain in the posterior leg with inability to push off while running often suggests gastrocnemius strain or Achilles tendon injury.
- This leads to weakness in plantar flexion.

Other options:

- A. Tibialis anterior: dorsiflexion of the ankle.
- C. Tibialis posterior: plantar flexion and inversion but not the primary powerful plantar flexor.
- D. Fibularis longus: assists in plantar flexion and eversion.

## QUESTION

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

CORRECT

D Deltoid

## RIGHT ANSWER

OK C. Chopart

## WHY THIS IS RIGHT

The Y-shaped ligament connecting the calcaneus to the navicular and cuboid bones is the bifurcate ligament, commonly associated with the Chopart joint.

The bifurcate ligament arises from the anterior process of the calcaneus and divides into two limbs forming a Y-shape:

1. Calcaneonavicular ligament -> attaches to the navicular bone
  2. Calcaneocuboid ligament -> attaches to the cuboid bone
- Stabilizes the midtarsal (transverse tarsal) joint, also called the Chopart joint.
  - Helps maintain integrity of the lateral longitudinal arch of the foot.

Why Other Options Are Incorrect:

- Lisfranc ligament -> connects medial cuneiform to base of 2nd metatarsal (tarsometatarsal joint).
- Spring ligament (plantar calcaneonavicular ligament) -> supports head of talus and medial longitudinal arch.
- Deltoid ligament -> strong medial ligament of the ankle joint.

## QUESTION

A pedestrian crossing the road is met with a road traffic accident. He has presented to the emergency with left foot drop. Power in tibialis anterior, extensor digitorum longus, and extensor hallucis longus is 0/5. While power in tibialis posterior, gastrocnemius is 4/5. What is the likely site of injury?

A Supracondylar fracture of left femur

B Fracture neck of left fibula

CORRECT

C Posterior dislocation of femur head

D Left ankle fracture

## RIGHT ANSWER

OK

B. Fracture neck of left fibula

## WHY THIS IS RIGHT

Foot drop is characterized by inability to dorsiflex the foot, resulting in a high-stepping gait (steppage gait). It most commonly occurs due to injury to the common peroneal (fibular) nerve. The common peroneal nerve winds superficially around the neck of the fibula, making it highly vulnerable to injury in fractures at this site.

The common peroneal nerve divides into deep and superficial peroneal nerves:

- Deep peroneal nerve -> supplies dorsiflexors of the foot
- Tibialis anterior
- Extensor hallucis longus
- Extensor digitorum longus

In the question, these muscles have power 0/5, explaining the foot drop.

Muscles Spared:

- Tibialis posterior
- Gastrocnemius

These are supplied by the tibial nerve, which remains intact, explaining their preserved power (4/5).



## QUESTION

Identify the vein that is most likely affected in the image shown.



**A** Great saphenous vein

CORRECT

**B** Short saphenous vein

**C** Femoral vein

**D** Perforator vein

## RIGHT ANSWER

OK

**A. Great saphenous vein**

## WHY THIS IS RIGHT

Varicosities most commonly involve the great saphenous vein due to valvular incompetence, especially at the saphenofemoral junction. It runs along the medial side of the leg and thigh, making it the vein most frequently affected in varicose vein disease.

## QUESTION

A patient presents with loss of sensation on the lateral aspect of the sole. Which of the following nerve roots is most likely affected?

A L4

B L5

C S1

CORRECT

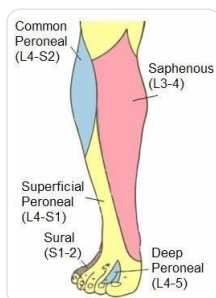
D S2

## RIGHT ANSWER

OK C. S1

## WHY THIS IS RIGHT

The lateral aspect of the sole corresponds to the S1 dermatome, supplied via branches of the tibial nerve. S1 root involvement is classically associated with sensory loss over the lateral foot and sole, often seen in L5-S1 disc pathology. L4 and L5 supply medial leg and dorsum of foot, while S2 mainly supplies the posterior thigh and perineal region.



## QUESTION

In the provided radiograph of the leg, identify the structure whose injury results in limited dorsiflexion of the foot.



A A

B B

C C

D D

CORRECT

RIGHT ANSWER

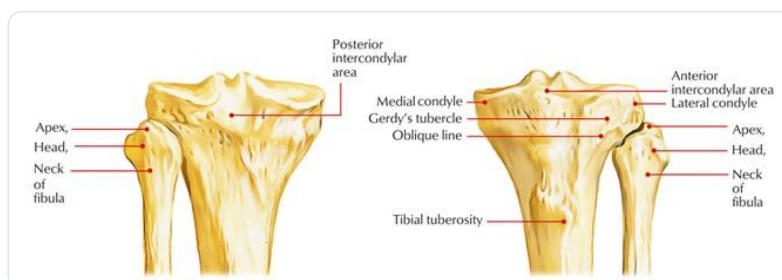
OK

D. D

## WHY THIS IS RIGHT

The marked structure corresponds to the neck of the fibula, where the common peroneal (fibular) nerve winds superficially.

Injury at this site affects the deep peroneal nerve, leading to paralysis of dorsiflexors and resulting in foot drop.



## QUESTION

A patient sustains an injury on the lateral aspect of the knee. After a few days, he develops difficulty in walking due to dragging of foot, along with numbness over the upper lateral side of the leg and dorsum of the foot. Which of the following nerves is most commonly injured in this case?

A Sciatic nerve

B Common peroneal nerve

CORRECT

C Deep peroneal nerve

D Superficial peroneal nerve

## RIGHT ANSWER

OK

B. Common peroneal nerve

## WHY THIS IS RIGHT

The common peroneal nerve winds around the neck of the fibula on the lateral side of the knee, making it highly vulnerable to injury.

Damage causes foot drop due to loss of dorsiflexion (deep peroneal nerve) and sensory loss over the upper lateral leg and dorsum of the foot (superficial peroneal nerve).

## QUESTION

Examine the radiograph of the foot and identify the bone marked by the arrow.



A Lateral cuneiform

B Intermediate cuneiform

C **Navicular**

CORRECT

D Cuboid

## RIGHT ANSWER

OK C. Navicular

## WHY THIS IS RIGHT

The navicular is a boat-shaped tarsal bone located on the medial side of the foot, between the talus proximally and the three cuneiforms distally. It is a key component of the medial longitudinal arch and is prone to stress fractures, especially in athletes. Cuboid lies laterally, while cuneiforms are distal to the navicular and smaller in size.

## QUESTION

A patient underwent surgery for the varicose vein. He now complains of sensory loss over the medial aspect of the leg and foot. Which of the following nerves is most likely to be injured?

- A Sural nerve
- B Superficial peroneal nerve
- C Deep peroneal nerve
- D Saphenous nerve**

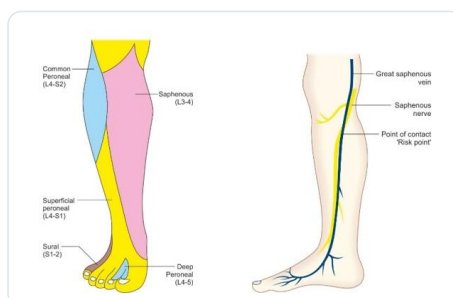
CORRECT

## RIGHT ANSWER

- OK **D. Saphenous nerve**

## WHY THIS IS RIGHT

The saphenous nerve is a pure sensory branch of the femoral nerve supplying the medial aspect of the leg and foot. It runs alongside the great saphenous vein, making it vulnerable during varicose vein surgery. Sural nerve supplies the lateral foot, while superficial and deep peroneal nerves supply the dorsum of foot and first web space, respectively.



## QUESTION

Injury at which of the following marked sites causes failure of dorsiflexion?



A 3

CORRECT

B 2

C 1

D 4

RIGHT ANSWER

OK A. 3

## WHY THIS IS RIGHT

The marked site corresponds to the neck of the fibula, where the common fibular (peroneal) nerve winds superficially and is highly vulnerable to injury. Damage here affects the deep fibular nerve, leading to paralysis of dorsiflexors of the foot and resulting in foot drop.

## QUESTION

Which nerve supplies the hybrid muscle partially spared in a patient who presented with sciatica and tender hamstrings?

A Common peroneal nerve

B Femoral nerve

C **Obturator nerve**

CORRECT

D Tibial nerve

## RIGHT ANSWER

OK C. Obturator nerve

## WHY THIS IS RIGHT

The hybrid muscle referred to is the adductor magnus, which has a dual nerve supply-the hamstring (ischiocondylar) part by tibial nerve and the adductor part by obturator nerve. In sciatica, tibial nerve fibers are affected, but the obturator nerve supply partially spares the muscle. Thus, residual function of adductor magnus points to obturator nerve involvement.



## QUESTION

During examination of a patient with an intern, the professor asks the patient to invert his foot and he points at the prominent tendon behind the medial malleolus. Which is the tendon being pointed at here?

A Tibialis anterior

B Tibialis posterior

CORRECT

C Extensor digitorum

D Extensor hallucis longus

## RIGHT ANSWER

OK B. Tibialis posterior

## WHY THIS IS RIGHT

The tibialis posterior tendon passes behind the medial malleolus and is the chief inverter of the foot. It also supports the medial longitudinal arch, making its tendon prominent during inversion. Tibialis anterior and extensor tendons lie anterior to the ankle joint, not behind the medial malleolus.

## QUESTION

Which artery is used for AV shunting with the great saphenous vein for hemodialysis and is present behind the medial malleolus and 2.5 cm in front of the tendon calcaneus?

A Peroneal artery

B Anterior tibial artery

C Dorsalis pedis artery

D Posterior tibial artery

CORRECT

## RIGHT ANSWER

OK

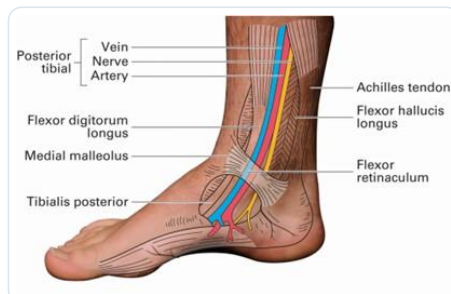
D. Posterior tibial artery

## WHY THIS IS RIGHT

The posterior tibial artery runs behind the medial malleolus, approximately 2.5 cm anterior to the tendon calcaneus, making it easily accessible.

It is commonly used for arteriovenous shunting with the great saphenous vein in haemodialysis.

Peroneal artery lies deep, anterior tibial continues as dorsalis pedis on the dorsum of foot, and dorsalis pedis is not located behind the medial malleolus.



## QUESTION

Which segment of the vertebrae is involved in a patient presenting with pain in the back of the thigh and the leg after lifting heavy weight?

A S2

B S1

CORRECT

C L5

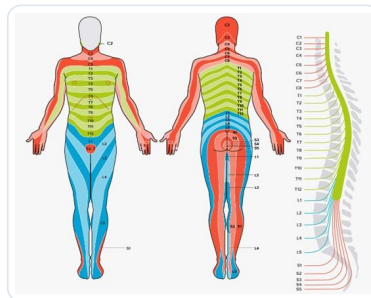
D L4

RIGHT ANSWER

OK B. S1

## WHY THIS IS RIGHT

Pain radiating along the back of the thigh and posterior leg corresponds to the S1 dermatome, classically seen in sciatica. S1 root involvement commonly occurs with L5-S1 disc herniation, affecting the Achilles reflex. L4 and L5 involve anterior/anterolateral leg regions, while S2 pain is more perineal/posterior thigh only.



## QUESTION

A patient presents with an ankle injury following excessive eversion of the foot. Which of the following ligaments is most commonly injured in this type of injury?

A Anterior talo-fibular ligament

B Posterior talo-fibular ligament

C Deltoid ligament

CORRECT

D Calcaneo-fibular ligament

## RIGHT ANSWER

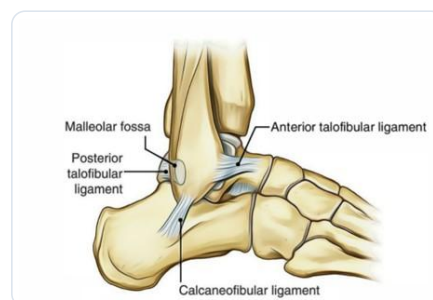
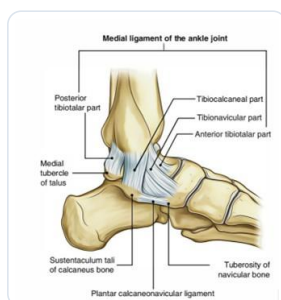
OK C. Deltoid ligament

## WHY THIS IS RIGHT

The correct answer is Deltoid ligament.

Excessive eversion stresses the medial collateral (deltoid) ligament, making it the ligament most commonly injured in eversion ankle trauma.

ATFL, PTFL, and calcaneofibular ligaments are lateral ligaments typically injured in inversion injuries, not eversion.



## QUESTION

A patient presents with pain along the lateral aspect of the thigh. What is the root value of this nerve?

A T12-L1

B L1-L2

C L2-L3

CORRECT

D L3-L4

RIGHT ANSWER

OK

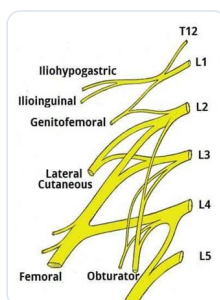
C. L2-L3

## WHY THIS IS RIGHT

Pain along the lateral aspect of the thigh with sensory symptoms indicates involvement of the lateral femoral cutaneous nerve.

This nerve arises from L2-L3 roots, passes under the inguinal ligament near ASIS, and is commonly compressed causing meralgia paresthetica.

It is a purely sensory nerve, with no motor deficit, helping distinguish it from femoral or obturator nerve lesions.



## QUESTION

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

Options:

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

**A** 2 and 5

CORRECT

**B** 3 and 4

**C** 1 and 3

**D** 2 and 4

## RIGHT ANSWER

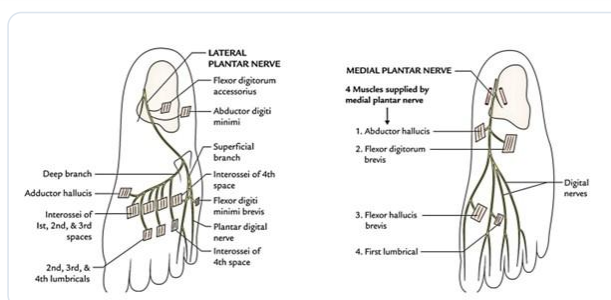
OK

**A. 2 and 5**

## WHY THIS IS RIGHT

The lateral plantar nerve supplies most intrinsic sole muscles, including flexor digitorum accessorius (quadratus plantae) and the interossei (via its deep branch).

Abductor hallucis and the first lumbrical are supplied by the medial plantar nerve, while flexor hallucis brevis has dual supply but its medial head is medial plantar-hence excluded here.



## QUESTION

When asked the patient to stand on left foot, right side went down. Which structures are involved in this case?

Options:

1. Superior gluteal nerve
2. Gluteus minimus
3. Gluteus medius
4. Sciatic nerve



A 1, 2, 3, 4

B 1, 2, 3

CORRECT

C 2, 3, 4

D 1, 3, 4

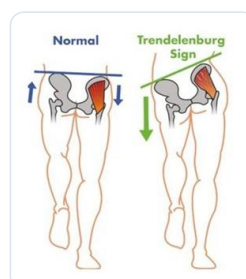
## RIGHT ANSWER

OK B. 1, 2, 3

## WHY THIS IS RIGHT

The finding describes a positive Trendelenburg sign, due to weakness of gluteus medius and minimus on the stance side. Both muscles are supplied by the superior gluteal nerve, which stabilizes the pelvis during single-leg stance. The sciatic nerve is not involved in pelvic stabilization and does not contribute to this sign.

This question describes a clinical scenario where a patient is exhibiting a positive Trendelenburg sign. When asked to stand on the left foot, the patient's right-side drops, indicating a problem with the muscles or nerves responsible for maintaining hip stability. The Trendelenburg sign indicates weakness or paralysis of the muscles innervated by the superior gluteal nerve.



## QUESTION

| Which is the most common hernia in females?

- A** Direct inguinal hernia
- B** Indirect inguinal hernia
- C** Femoral hernia
- D** Obturator hernia

CORRECT

## RIGHT ANSWER

- OK** **B. Indirect inguinal hernia**

## WHY THIS IS RIGHT

In females, the most common type of hernia is the indirect inguinal hernia, despite femoral hernias being more common in females compared to males.

Incidence of Hernia in Females: Indirect inguinal Hernia > Direct inguinal Hernia > Femoral hernia

Most common hernia overall -> Indirect inguinal

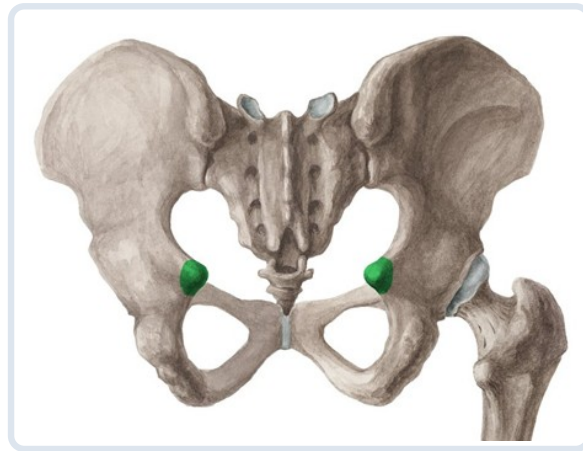
Most common hernia in females -> Indirect inguinal

Femoral hernia -> More common in females but not most common overall



## QUESTION

What is the vertebral level of the marked structure in the image in anatomical position?



A L4

B L4-L5

C S3-S5

D Coccyx

CORRECT

RIGHT ANSWER

OK

D. Coccyx

## WHY THIS IS RIGHT

The correct answer is Coccyx.

The ischial spine, when correlated in anatomical position, lies at the level of the coccyx.

It is a key pelvic landmark used in obstetrics and anaesthesia (pudendal nerve block).

Levels L4-L5 correspond to iliac crest, and S3-S5 relate to pelvic diaphragm, not the ischial spine.

## QUESTION

**| While walking, the suspended leg is supported by which muscle on other side?**

**A** Gluteus medius

CORRECT

**B** Gluteus maximus

**C** Tensor Fascia Lata

**D** Quadriceps femoris

## RIGHT ANSWER

OK

**A. Gluteus medius**

## WHY THIS IS RIGHT

The correct answer is Gluteus medius.

During walking, gluteus medius of the stance limb stabilizes the pelvis and prevents dropping of the pelvis on the suspended side.

Paralysis causes a positive Trendelenburg sign with pelvic tilt toward the unsupported limb.

Gluteus maximus extends the hip, tensor fascia lata assists abduction, and quadriceps stabilizes the knee, not pelvic support.

## QUESTION

Which of the following muscles are supplied by superficial peroneal nerve?

1. Peroneus brevis
2. Peroneus longus
3. Peroneus tertius
4. Extensor hallucis longus

A 1, 2, 3

B 1, 2

CORRECT

C 1, 2, 3, 4

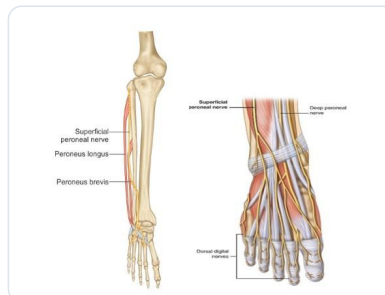
D 1, 3, 4

RIGHT ANSWER

OK B. 1, 2

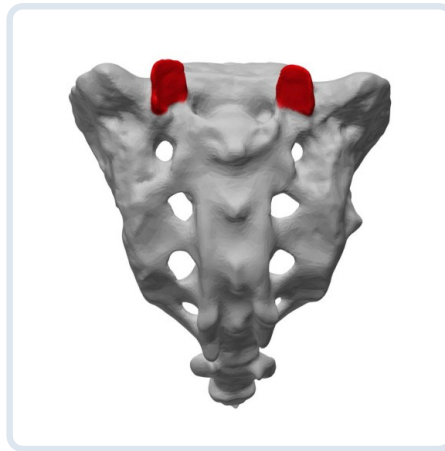
## WHY THIS IS RIGHT

The leg is divided into three compartments, each with its specific nerve supply. The lateral compartment of the leg contains only two muscles: peroneus longus and peroneus brevis. Both of these muscles are innervated by the superficial peroneal nerve.



## QUESTION

What is the primary action of the muscle attached to the area indicated by the arrow in the image given below?



- A Medial rotation of hip
- B External rotation of hip/ Abduction of hip**

CORRECT

- C Flexion at knee
- D Extension at knee

## RIGHT ANSWER

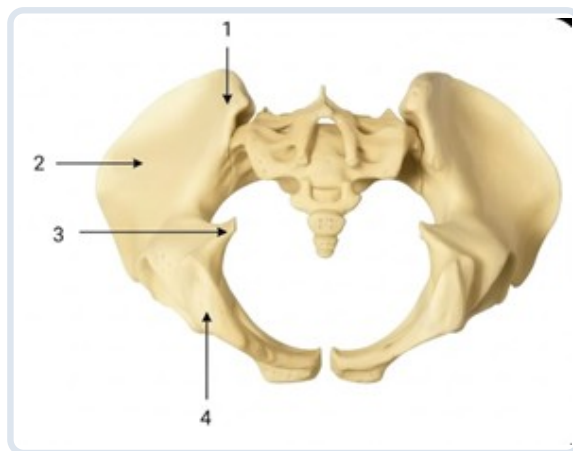
- B. External rotation of hip/ Abduction of hip**

## WHY THIS IS RIGHT

The arrow in the image points to the attachment site of the gluteus maximus muscle on the sacrum. The gluteus maximus is the largest and most superficial muscle of the gluteal region.

## QUESTION

Which of the following provides attachment to the muscle responsible for extension at the hip and at the knee?



CORRECT

A 1

B 2

C 3

D 4

RIGHT ANSWER

OK

A. 1

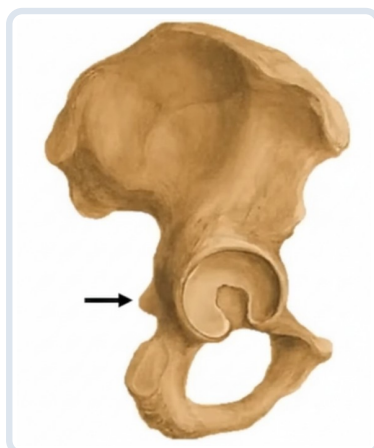
## WHY THIS IS RIGHT

The muscle responsible for extension at both the hip and the knee is the hamstring group. Hamstrings (semitendinosus, semimembranosus, long head of biceps femoris) originate from the ischial tuberosity, which is label 4 in the image.

From the labelled image: Label 2 corresponds to the iliac ala (gluteus medius attachment - hip abduction), label 1 relates to gluteus maximus (hip extension only), and label 3 marks the ischial spine (pelvic floor/pudendal landmark), none of which extend the knee.

## QUESTION

Which of the following is not related/attached to the structure marked in the image?



CORRECT

**A** Tendon of obturator externus

**B** Pudendal nerve

**C** Internal pudendal vessels

**D** Ischiococcygeus

RIGHT ANSWER

OK

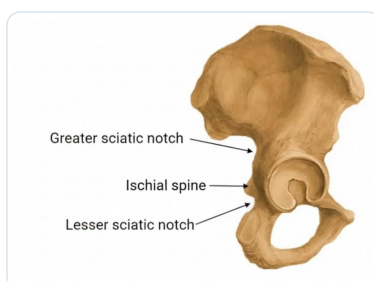
**A. Tendon of obturator externus**

## WHY THIS IS RIGHT

The marked structure is the ischial spine.

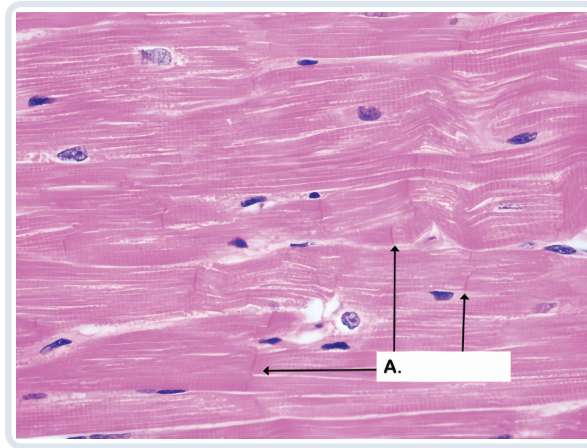
It gives attachment to ischiococcygeus and serves as a landmark where the pudendal nerve and internal pudendal vessels hook around from pelvis to perineum.

The tendon of obturator externus attaches to the trochanteric fossa of femur, not to the ischial spine, making it the incorrect option.



## QUESTION

| Area marked A in the given figure contain all the following, except:



**A** Zonula occludens

CORRECT

**B** Zonula adherens

**C** Macula adherens

**D** Gap junction

## RIGHT ANSWER

**A. Zonula occludens**

## WHY THIS IS RIGHT

The marked area represents an intercalated disc of cardiac muscle. Intercalated discs are specialized junctional complexes that connect adjacent cardiomyocytes and enable mechanical and electrical coupling for synchronized contraction.

Intercalated discs contain three main junctions:

- Zonula adherens (adherens junctions)

Anchor actin filaments and transmit contractile force between cardiac cells.

- Macula adherens (desmosomes)

Provide strong mechanical adhesion, preventing separation of cells during contraction.

- Gap junctions

Allow rapid electrical conduction by permitting ion flow between adjacent cells.

Zonula occludens (tight junctions) are not present in intercalated discs; they are typically found in epithelial tissues where they create a permeability barrier.

## QUESTION

Which of the following is/are incorrectly matched?

1. Sternoclavicular joint - Plane synovial joint
2. Wrist and knuckle joints - Hinge variety of synovial joints
3. Middle tibiofibular joint - Syndesmosis
4. Calcaneocuboid joint - Saddle synovial joint
5. Elbow and ankle joint - Ellipsoid synovial joint

A 1, 2, 4

B 2, 3, 5

C 1, 3, 4, 5

D 1, 2, 5

CORRECT

RIGHT ANSWER

OK  
D. 1, 2, 5

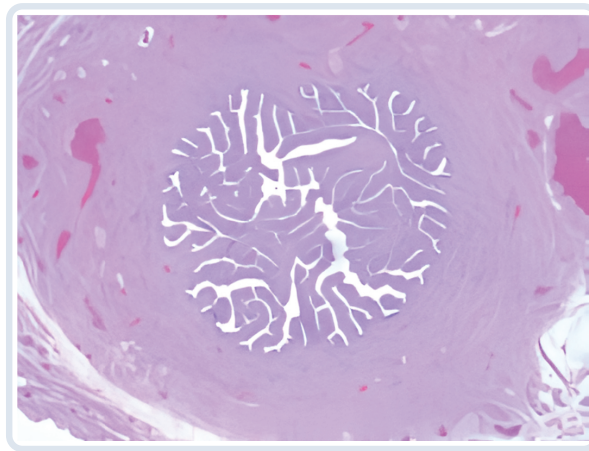
## WHY THIS IS RIGHT

The source quiz contains the placeholder “\$2” here and does not include a written explanation for this item.



## QUESTION

Identify the structure based on the histological features of the specimen obtained after TAH + BSO.



A Ovary

B Cervix

C Fallopian tube

CORRECT

D Vagina

## RIGHT ANSWER

OK

C. Fallopian tube

## WHY THIS IS RIGHT

The histological image shows features characteristic of the fallopian tube (uterine tube).

- Highly folded mucosa (plicae) creating a branching, labyrinth-like lumen
- Lined by simple columnar ciliated epithelium
- Two main cell types:
  - Ciliated cells -> move the ovum toward the uterus
  - Secretory (peg) cells -> nourish gametes and early embryo
- Muscular layer with inner circular and outer longitudinal smooth muscle
- No glands in the mucosa

The complex, arborizing mucosal folds filling most of the lumen are the hallmark of the ampulla of the fallopian tube, distinguishing it from:

- Ovary -> follicles and stromal tissue
- Cervix -> mucous glands and simple columnar epithelium
- Vagina -> stratified squamous epithelium without glands

## QUESTION

A 6-year-old child falls from his bicycle and injures his hand. On X-ray, a fracture of the first metacarpal bone is noticed. Where is the epiphysis of the affected bone?

**A** At the base

CORRECT

**B** At the neck

**C** At the head

**D** In the shaft

## RIGHT ANSWER

**OK** A. At the base

## WHY THIS IS RIGHT

Metacarpal bones have secondary ossification centers (epiphyses) that differ between the first metacarpal and the other metacarpals.

Ossification pattern of metacarpals:

- 1st metacarpal (thumb):
  - Epiphysis at the base
- 2nd-5th metacarpals:
  - Epiphysis at the head

The first metacarpal behaves developmentally like a phalanx, therefore its secondary ossification center appears at the base rather than the head.

## QUESTION

A 21-year-old patient Suyash came to OPD with history of fall on hand. Now he is having pain at hand region. X-ray of patient is given. Which of the following joint has been shown in his X-ray?



- A Hinge joint
- B Ball-and-socket joint
- C Ellipsoid joint**
- D Saddle joint

CORRECT

## RIGHT ANSWER

- OK **C. Ellipsoid joint**

## WHY THIS IS RIGHT

The X-ray indicates the radiocarpal (wrist) joint, which is a condyloid/ellipsoid synovial joint. Articulating surfaces:

- Proximally: Distal end of radius and articular disc of distal radioulnar joint
- Distally: Scaphoid, lunate, and triquetrum (proximal carpal bones)

Because it is an ellipsoid joint, it allows biaxial movement:

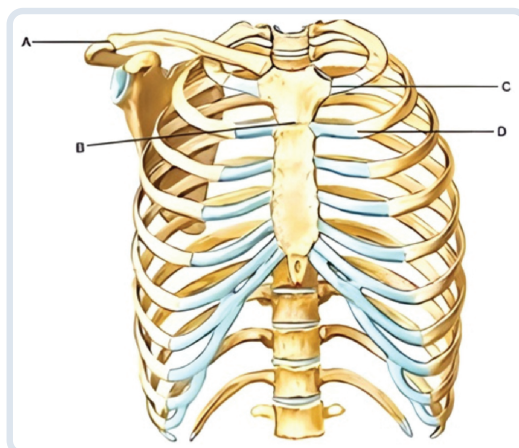
- Flexion
- Extension
- Abduction (radial deviation)
- Adduction (ulnar deviation)
- Circumduction (combination of above)

Comparison with other options:

- Hinge joint: elbow, interphalangeal joints
- Ball-and-socket: shoulder, hip
- Saddle joint: first carpometacarpal joint of thumb

## QUESTION

Which of the following is a synchondrosis joint?



A A, D

B B, C

C C, D

CORRECT

D D, B

## RIGHT ANSWER

OK C. C, D

## WHY THIS IS RIGHT

A synchondrosis joint is a primary cartilaginous joint where bones are united by hyaline cartilage. These joints usually allow little or no movement and may later ossify.

Important examples include:

1. Costochondral joints
  - Between the rib and its costal cartilage
  - Example: structures labeled C and D in the figure
2. First sternocostal joint
  - Between the first costal cartilage and sternum
  - Also a primary cartilaginous joint

Comparison with other thoracic joints:

- Sternoclavicular joint -> synovial saddle joint
- Manubriosternal joint -> secondary cartilaginous joint (symphysis)
- Other sternocostal joints (2-7) -> synovial plane joints

## QUESTION

Which of the following is an example of pressure epiphysis?

- A Tubercles of humerus
- B Head of femur**
- C Coracoid process of scapula
- D Trochanters of femur

CORRECT

## RIGHT ANSWER

OK **B. Head of femur**

## WHY THIS IS RIGHT

Epiphyses are classified based on their function and role in bone development. One important type is the pressure epiphysis, which is involved in weight transmission and articulation at joints.

Pressure Epiphysis:

- Located at articular ends of long bones.
- Transmits body weight and mechanical pressure across joints.
- Usually covered by articular cartilage.
- Develops secondary ossification centers.

Example: Head of femur - articulates with the acetabulum and transmits body weight at the hip joint.

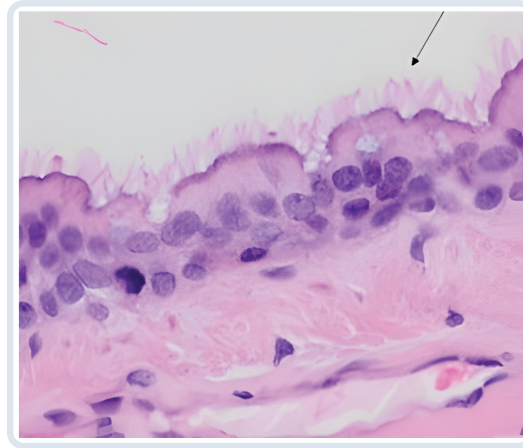
Why Other Options Are Incorrect:

- Tubercles of humerus -> Traction epiphysis (site of muscle attachment).
- Coracoid process of scapula -> Atavistic epiphysis (represents a bone that was separate in lower animals).
- Trochanters of femur -> Traction epiphysis (muscle attachment sites).

| Types of Epiphyses | Examples                                                                                           |
|--------------------|----------------------------------------------------------------------------------------------------|
| Pressure           | Head of femur, Head of humerus, Lower end of radius, Tibial condyles                               |
| Traction           | Greater trochanter (GT) and Lesser trochanter (LT) of femur, Mastoid process, GT and LT of humerus |
| Atavistic          | Coracoid process, Os trigonum                                                                      |

## QUESTION

The structures marked in the image below are found in the epithelial lining of all of the following sites, except:



A Oviduct

B PCT

CORRECT

C Bronchi

D Ependyma

RIGHT ANSWER

OK

B. PCT

## WHY THIS IS RIGHT

The structures marked in the image are cilia, which are motile hair-like projections on the apical surface of epithelial cells. They function to move fluids, mucus, or cells across epithelial surfaces.

Sites Where Cilia Are Present:

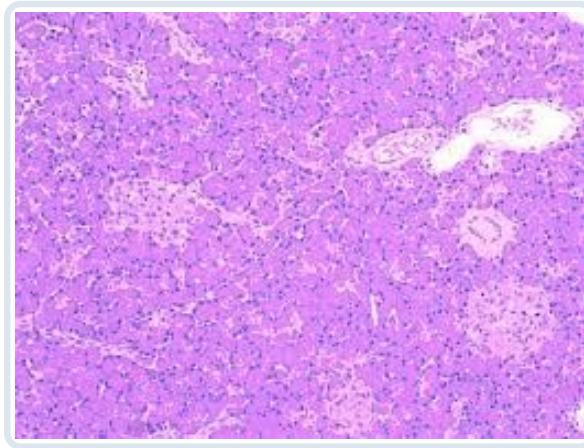
- Oviduct (Fallopian tube)
- Simple columnar ciliated epithelium
- Cilia help propel the ovum toward the uterus.
- Bronchi / respiratory tract
- Pseudostratified ciliated columnar epithelium
- Cilia move mucus and trapped particles upward (mucociliary clearance).
- Ependyma (lining of ventricles of brain and central canal of spinal cord)
- Ciliated simple cuboidal/columnar cells
- Cilia help circulate cerebrospinal fluid (CSF).

Site Where They Are NOT Present:

- Proximal Convoluted Tubule (PCT)
- Lined by simple cuboidal epithelium with microvilli, forming a brush border, not cilia.
- Microvilli increase surface area for absorption.

## QUESTION

Identify the given structure:



A Lymph node

B Glomerulus

C Spleen

D Pancreatic islet cells

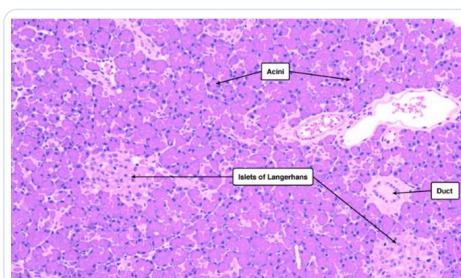
CORRECT

## RIGHT ANSWER

OK D. Pancreatic islet cells

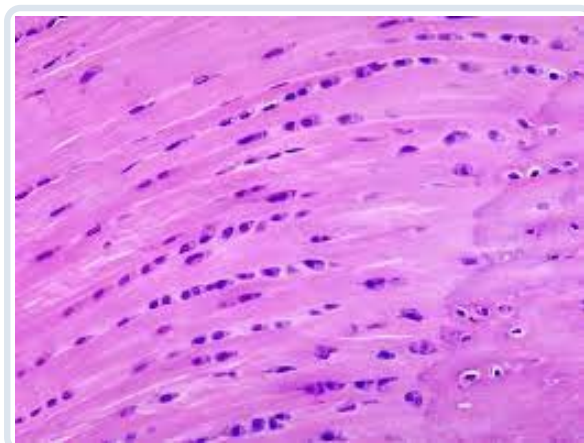
## WHY THIS IS RIGHT

Islets of Langerhans appear as pale-staining, rounded cell clusters scattered within darker exocrine pancreatic tissue. They contain endocrine cells secreting insulin, glucagon, and somatostatin. Lymph nodes show follicles, spleen shows white and red pulp, and glomerulus is a capillary tuft within Bowman's capsule.



## QUESTION

Identify the cartilage given below:



A Non articular hyaline cartilage

B Articular hyaline cartilage

C Yellow cartilage

D White fibrocartilage

CORRECT

## RIGHT ANSWER

OK

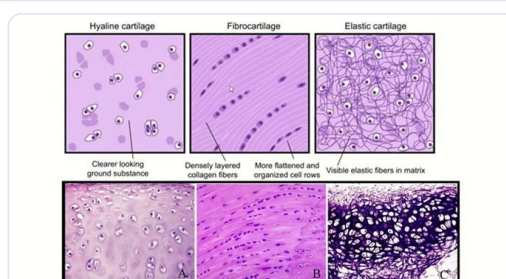
D. White fibrocartilage

## WHY THIS IS RIGHT

The given image shows prominent collagen fibers arranged in bundles with intervening rows of chondrocytes. This is suggestive of white fibrocartilage.

Microscopy of fibrocartilage shows the following:

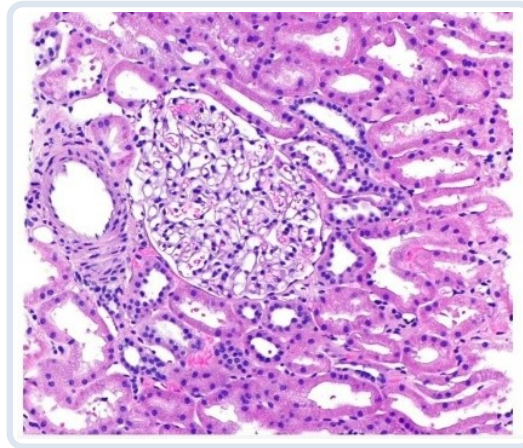
- Chondrocytes- Round in shape (in tendons they are flattened and elongated)
- Ground tissue with collagen fibers- Type I collagen fibers
- Absence of perichondrium





## QUESTION

Identify the structure in the following histological image



A Leydig cells of testis

B Pancreatic islet cells

C Hassall's corpuscles

D Glomerulus

CORRECT

RIGHT ANSWER

OK

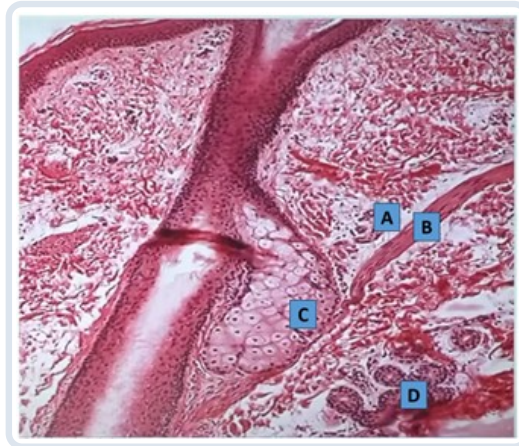
D. Glomerulus

## WHY THIS IS RIGHT

A glomerulus appears as a tuft of capillaries surrounded by Bowman's capsule, forming the renal corpuscle. Leydig cells are interstitial testicular cells, pancreatic islets are pale endocrine clusters, and Hassall's corpuscles are concentric epithelial whorls seen in the thymic medulla.

## QUESTION

Identify the structures in the given image.



A

A - Apocrine sweat gland, B - Arrector pilorum, C - Eccrine sweat gland, D - Sebaceous gland

B

A - Arrector pilorum, B - Apocrine sweat gland, C - Eccrine sweat gland, D - Sebaceous gland

C

A - Sebaceous gland, B - Eccrine sweat gland, C - Arrector pilorum, D - Apocrine sweat gland

D

A - Eccrine sweat gland, B - Arrector pilorum, C - Sebaceous gland, D - Apocrine sweat gland

CORRECT

## RIGHT ANSWER

OK

D. A - Eccrine sweat gland, B - Arrector pilorum, C - Sebaceous gland, D - Apocrine sweat gland

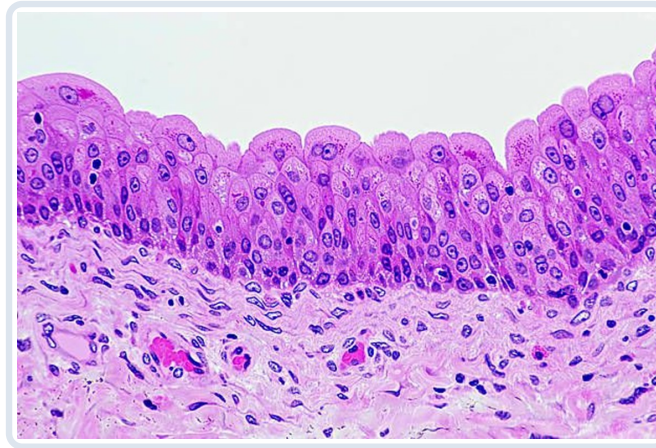
## WHY THIS IS RIGHT

Eccrine glands are small, coiled tubular glands opening directly onto the skin surface, while apocrine glands are larger, open into hair follicles, and are active after puberty.

The sebaceous gland is a lobulated holocrine gland associated with hair follicles, and the arrector pilorum is smooth muscle attaching the follicle to the dermis, responsible for piloerection.

## QUESTION

| The shown epithelium is seen in:



A Duodenum

B Gall bladder

C Trachea

D Ureter

CORRECT

## RIGHT ANSWER

OK D. Ureter

## WHY THIS IS RIGHT

The ureter is lined by transitional epithelium (urothelium), which allows distension without loss of integrity. Duodenum and gall bladder have simple columnar epithelium, while trachea is lined by pseudostratified ciliated columnar epithelium.

## QUESTION

A chronic tobacco consumer went to the dental clinic with bleeding lesions on the tongue and was diagnosed with carcinoma of the tongue. Which of the papillae does not have taste buds?

A Circumvallate

B Filiform

CORRECT

C Foliate

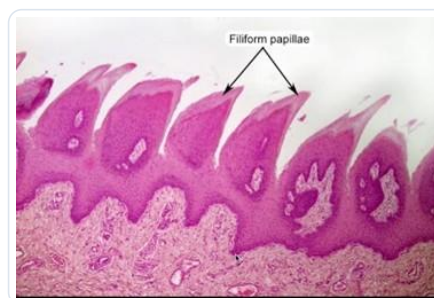
D Fungiform

## RIGHT ANSWER

OK B. Filiform

## WHY THIS IS RIGHT

Filiform papillae are most numerous and have a mechanical role, lacking taste buds and often keratinized. Circumvallate, foliate, and fungiform papillae contain taste buds and are involved in gustation, making them clinically relevant in tongue carcinomas affecting taste.



## QUESTION

| Longitudinal growth of the bone is affected from fracture at:

A Epiphysis

B Metaphysis

C Diaphysis

D Epiphyseal plate

CORRECT

## RIGHT ANSWER

OK D. Epiphyseal plate

## WHY THIS IS RIGHT

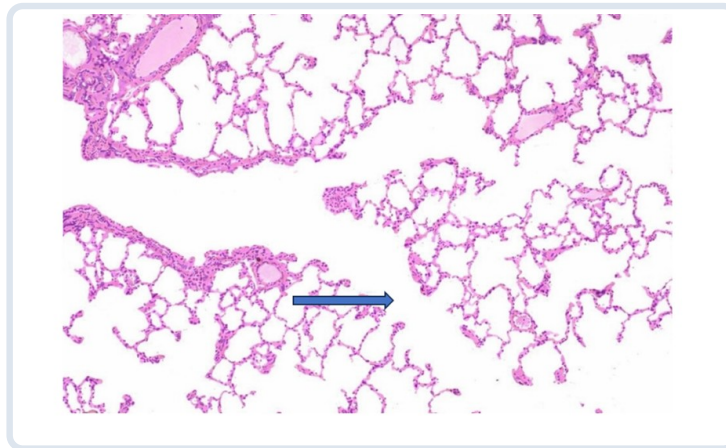
Longitudinal growth of long bones occurs at the epiphyseal (growth) plate, where cartilage proliferation and ossification take place.

Fracture or damage to this plate in growing children can cause growth arrest or limb length discrepancy.

Epiphysis, metaphysis, and diaphysis do not directly mediate longitudinal growth.

## QUESTION

Identify the structure indicated by the arrow:



A

Alveolar sac

B

Respiratory bronchus

CORRECT

C

Terminal bronchiole

D

Intrapulmonary bronchiole

## RIGHT ANSWER

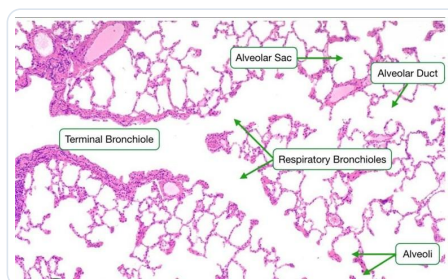
OK

B. Respiratory bronchus

## WHY THIS IS RIGHT

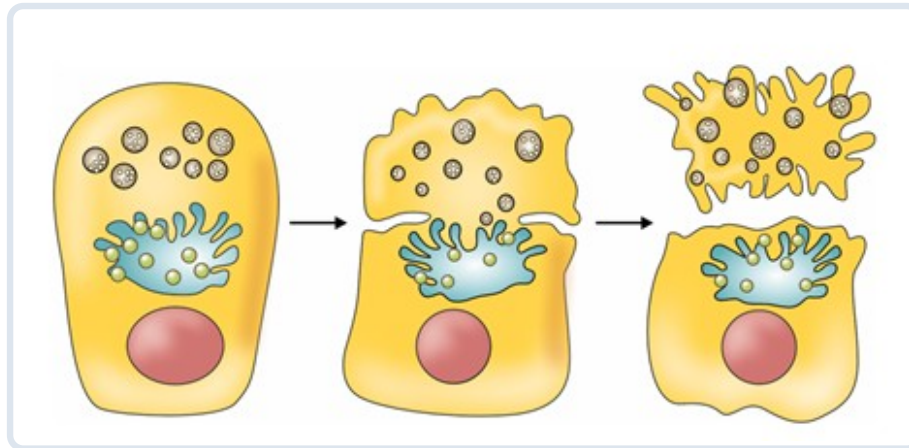
A respiratory bronchiole is identified by alveoli budding from its walls, marking the beginning of the respiratory zone where gas exchange occurs.

Terminal and intrapulmonary bronchioles lack alveoli and are purely conducting airways, while an alveolar sac is composed entirely of alveoli without a bronchiolar wall.



## QUESTION

Apocrine glands are present in which of the following?



- A Face
- B Scalp
- C Palms and soles
- D Axilla

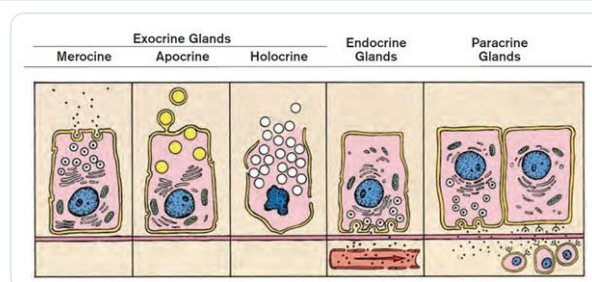
CORRECT

## RIGHT ANSWER

OK D. Axilla

## WHY THIS IS RIGHT

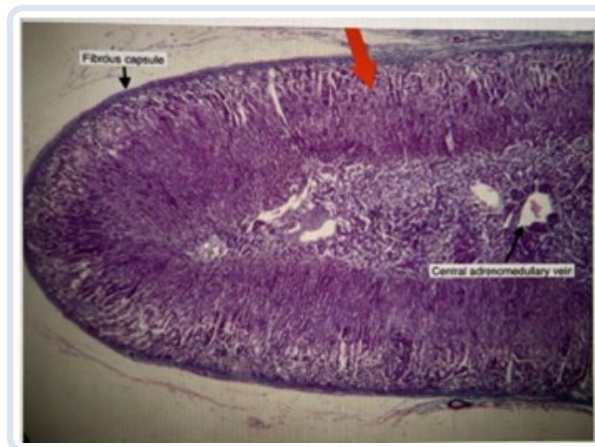
Apocrine glands are located in axilla, areola, perineum, and external auditory canal and become functional at puberty, secreting a viscous, protein-rich fluid responsible for body odor. Face and scalp predominantly contain sebaceous and eccrine glands, while palms and soles have only eccrine glands specialized for thermoregulation and grip.





## QUESTION

Which of the following is a function of the marked layer?



- A Gluconeogenesis
- B Sodium and water retention**
- C Increased sex hormones
- D Immune cell interaction

CORRECT

## RIGHT ANSWER

- OK B. Sodium and water retention**

## WHY THIS IS RIGHT

The marked layer is the zona glomerulosa of the adrenal cortex, which secretes aldosterone, a mineralocorticoid responsible for  $\text{Na}^+$  reabsorption and  $\text{K}^+$  excretion in the distal nephron. Zona fasciculata mediates gluconeogenesis via cortisol, zona reticularis produces sex steroids, and immune cell interaction is not a primary adrenal cortical function.



## QUESTION

Identify the type of joint marked in the image:



A Ball and socket

B Saddle

CORRECT

C Plane

D Gliding

RIGHT ANSWER

OK B. Saddle

## WHY THIS IS RIGHT

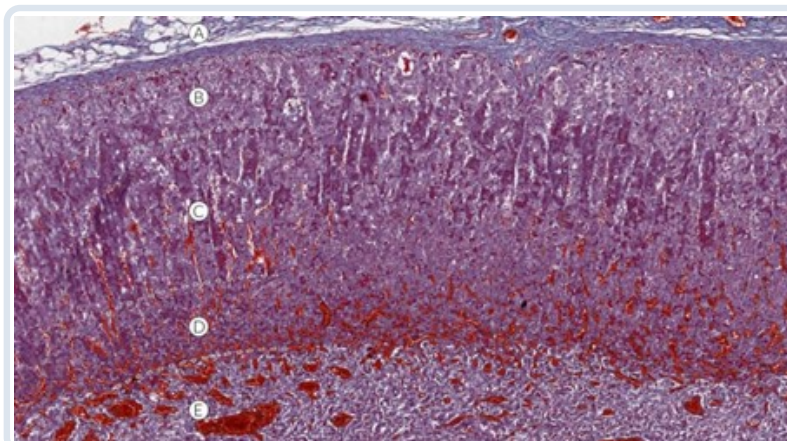
The marked joint is the incudo-malleolar joint, which is a saddle joint allowing limited reciprocal movements between malleus and incus.

The incudo-stapedial joint is a ball-and-socket joint, not saddle.

Plane/gliding joints do not permit the specialized movements required for sound transmission in the ossicular chain.

## QUESTION

Which are the hormones secreted from B,C,D,E respectively?



CORRECT

**A** B- Aldosterone, C- Cortisol, D- Androgen, E- Epinephrine

**B** B- Aldosterone, C- Androgen, D- Cortisol, E- Epinephrine

**C** B- Aldosterone, C- Epinephrine, D- Androgen, E- Cortisol

**D** B- Cortisol, C- Aldosterone, D- Androgen, E- Epinephrine

## RIGHT ANSWER

**OK** A. B- Aldosterone, C- Cortisol, D- Androgen, E- Epinephrine

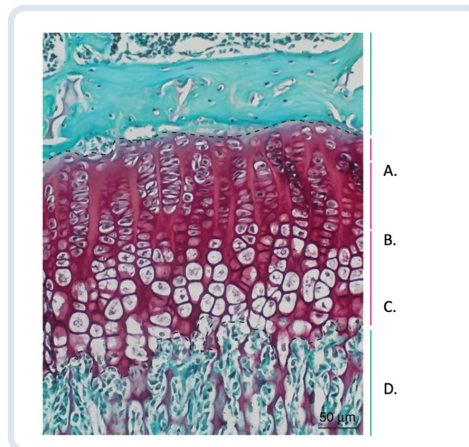
## WHY THIS IS RIGHT

No explanation was provided in the source quiz.

| Option | Zone             | Hormone Secreted                             | Function                                |
|--------|------------------|----------------------------------------------|-----------------------------------------|
| A      | Capsule          | -                                            | -                                       |
| B      | Zona Glomerulosa | Mineralocorticoids (Aldosterone)             | Regulates BP and electrolyte balance    |
| C      | Zona Fasciculata | Glucocorticoids (Cortisol)                   | Controls metabolism and immune response |
| D      | Zona Reticularis | Androgens                                    | Precursors for sex hormones             |
| E      | Adrenal Medulla  | Catecholamines (Epinephrine, Norepinephrine) | Mediates fight-or-flight response       |

## QUESTION

Calcium deposition is seen in which layer?



A A

B B

C C

D D

CORRECT

## RIGHT ANSWER

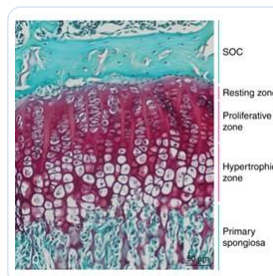
OK D. D

## WHY THIS IS RIGHT

Calcium deposition occurs in the zone of calcified cartilage, where cartilage matrix becomes mineralized before being replaced by bone.

This zone lies between the zone of hypertrophy and the zone of ossification in the epiphyseal plate.

Zones A-C represent resting, proliferative, and hypertrophic cartilage, where growth occurs but no mineralization takes place.



## QUESTION

Which joint is not formed by the bone shown in the image?



A Syndesmosis

B Synchrondrosis

CORRECT

C Plane joint

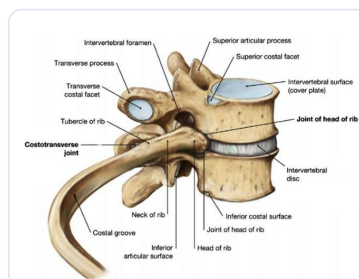
D Symphysis

## RIGHT ANSWER

OK B. Synchrondrosis

## WHY THIS IS RIGHT

Thoracic vertebrae do not form synchrondrosis (primary cartilaginous) joints; they are involved in forming plane joints, syndesmosis, and symphysis joints.



## QUESTION

Identify the structures shown in the images:



A Corpus callosum

B Psammoma body

C Corpus luteum

D Corpora amylacea

CORRECT

## RIGHT ANSWER

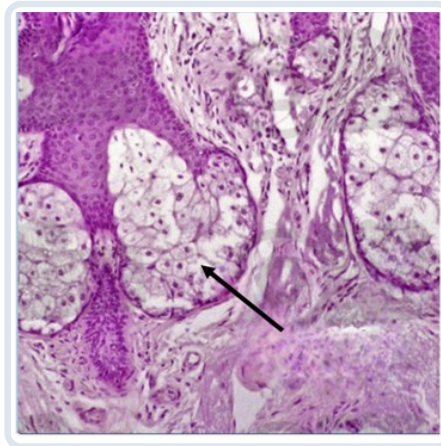
OK D. Corpora amylacea

## WHY THIS IS RIGHT

Corpora amylacea are round, laminated, eosinophilic bodies seen within glandular lumina or CNS tissue. They represent concentrically layered glycoproteinaceous material formed by degenerating cells. Commonly seen in prostate, lung, and brain with aging or chronic inflammation. Psammoma bodies are calcified, basophilic, and tumor-associated, while corpus luteum and corpus callosum are gross anatomical structures.

## QUESTION

Identify the type of gland marked in the image?



A Merocrine

B Eccrine

C Holocrine

CORRECT

D None

## RIGHT ANSWER

OK

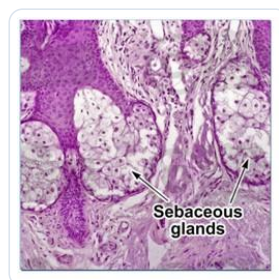
C. Holocrine

## WHY THIS IS RIGHT

The correct answer is Holocrine.

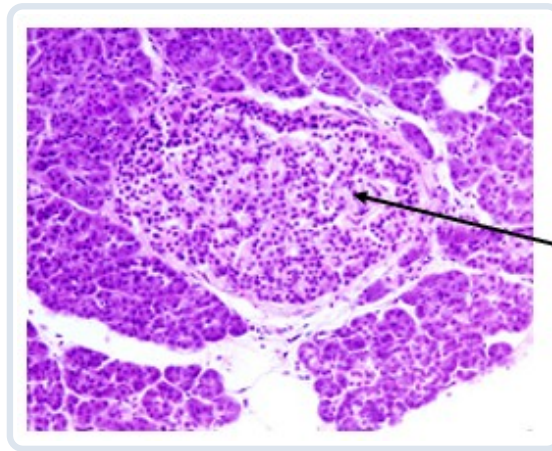
Sebaceous glands are holocrine glands where entire cells disintegrate to release sebum into the hair follicle.

Merocrine secretion (e.g., salivary glands, pancreas) releases products by exocytosis without cell loss, while eccrine glands are sweat glands using merocrine mechanism, not a separate mode.



## QUESTION

In the histological section shown, how do the cells in the highlighted cluster most commonly exert their influence on neighbouring pancreatic cells?



A Portal vasculature

B Paracrine effect

CORRECT

C Transformation from epithelial to mesothelial

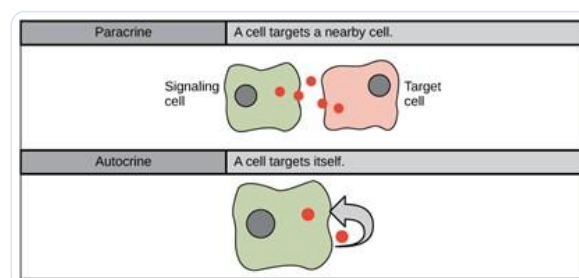
D Nerve mediated

## RIGHT ANSWER

OK B. Paracrine effect

## WHY THIS IS RIGHT

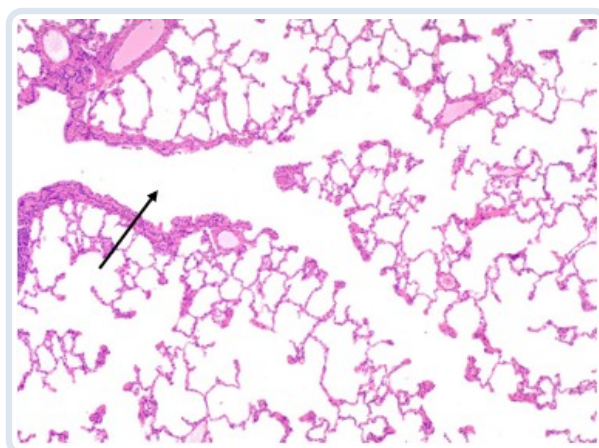
The marked cluster of cells represents the Islets of Langerhans within pancreatic tissue. The histological image shows the characteristic appearance of pancreatic parenchyma with dark eosinophilic areas representing serous acinar cells (exocrine pancreas) and lighter, less eosinophilic areas representing the islets of Langerhans (endocrine pancreas).





## QUESTION

Identify the marked structure from the histological slide given below?



A Respiratory bronchus

B Bronchus

C Terminal bronchus

CORRECT

D Alveoli

## RIGHT ANSWER

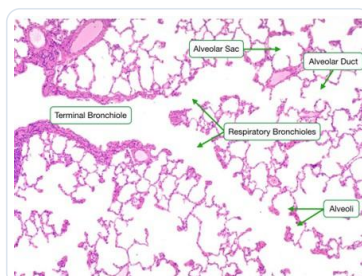
OK

C. Terminal bronchus

## WHY THIS IS RIGHT

This histological image shows a section of lung tissue displaying various components of the respiratory pathway. The marked structure represents a terminal bronchiole (terminal bronchus), which is characterized by its relatively thick muscular wall compared to the surrounding structures.

The respiratory pathway follows a hierarchical organization: primary bronchus -> secondary bronchus -> tertiary bronchus (supplying bronchopulmonary segments) -> terminal bronchioles -> respiratory bronchioles -> alveolar ducts -> alveolar sacs -> alveoli.





## QUESTION

| Which of the following does not have an endocrine component?

- A** [https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions\\_image/option/01KKDPB7Y9Y8ET3ZKGYCFWF7A6.jpg](https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions_image/option/01KKDPB7Y9Y8ET3ZKGYCFWF7A6.jpg)
- B** [https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions\\_image/option/01KKDPB80WEKWP0AB63R991BW3.jpg](https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions_image/option/01KKDPB80WEKWP0AB63R991BW3.jpg) CORRECT
- C** [https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions\\_image/option/01KKDPB83KPAMWPM5RT479M2MA.jpg](https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions_image/option/01KKDPB83KPAMWPM5RT479M2MA.jpg)
- D** [https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions\\_image/option/01KKDPB861FTMBFR8A5FHR0VC.jpg](https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions_image/option/01KKDPB861FTMBFR8A5FHR0VC.jpg)

## RIGHT ANSWER

- OK** **B.** [https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions\\_image/option/01KKDPB80WEKWP0AB63R991BW3.jpg](https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions_image/option/01KKDPB80WEKWP0AB63R991BW3.jpg)

## WHY THIS IS RIGHT

The correct answer is B (Uterus).

Testis (A) has Leydig cells, ovary (C) has follicles and corpus luteum, and pancreas (D) has islets of Langerhans, all providing endocrine function.

The uterus is a purely target organ for hormones and has no intrinsic endocrine component.

## QUESTION

What level of the vertebral column does the given cross-sectional image correspond to?



A T12

B T10

C T9

CORRECT

D T11

## RIGHT ANSWER

OK

C. T9

## WHY THIS IS RIGHT

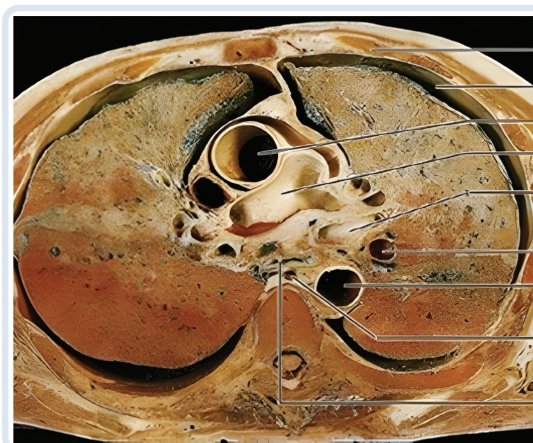
The T9 vertebral level corresponds to a transverse section of the lower thorax where the heart (mainly ventricles), lungs, esophagus, descending thoracic aorta, and inferior vena cava near the diaphragm can be identified.

In this section:

- The heart occupies the central anterior thoracic cavity (ventricular level).
- Lungs are seen bilaterally.
- The esophagus lies posterior to the heart.
- The descending thoracic aorta lies left of the vertebral body, while the IVC is seen toward the right side passing toward the diaphragm and liver.
- The liver may appear on the right side just below the diaphragm, which helps identify lower thoracic levels (T8-T10).

## QUESTION

Identify the level of the cross-section shown in the image below.



A T3

B T4

C T5

CORRECT

D T6

## RIGHT ANSWER

OK

C. T5

## WHY THIS IS RIGHT

The cross-section shown corresponds to the T5 vertebral level, which is recognized by characteristic mediastinal structures present at this level.

Important structures visible in a T5 cross-section include:

- Trachea (before bifurcation)
- Esophagus posterior to the trachea
- Descending thoracic aorta slightly to the left of the vertebral body
- Azygos vein on the right side of the vertebral column
- Right and left lungs with pleural cavities
- Thoracic vertebra and spinal canal

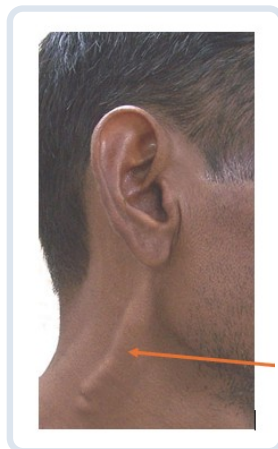
The T4-T5 level corresponds to the “sternal angle (Angle of Louis)” plane, which is used as a major anatomical landmark.

Structures at this plane include:

- Tracheal bifurcation (carina)
- Arch of aorta beginning and ending
- Division between superior and inferior mediastinum

## QUESTION

A patient with known history of leprosy presents to the clinic. On examination, a thickened nerve is noted in the neck (as shown in the image). Which of the following nerves is most likely involved?



A Auriculotemporal nerve

B **Great auricular nerve**

CORRECT

C Spinal accessory nerve

D Lesser occipital nerve

## RIGHT ANSWER

OK

**B. Great auricular nerve**

## WHY THIS IS RIGHT

In leprosy, superficial sensory nerves are commonly involved, leading to palpable thickening.

The great auricular nerve (C2-C3) runs superficially over the sternocleidomastoid in the neck and supplies the skin over the parotid region and lower auricle, making it a classic nerve affected in leprosy.

Auriculotemporal and lesser occipital nerves are less commonly thickened, while the spinal accessory nerve is motor.

## QUESTION

| Which of the following findings is characteristic of Frey's syndrome?

**A** Sweating & flushing over preauricular region

CORRECT

**B** Pain over preauricular region

**C** Anhidrosis, anophthalmosis, miosis

**D** Anhidrosis, anophthalmosis, mydriasis

## RIGHT ANSWER

OK

**A. Sweating & flushing over preauricular region**

## WHY THIS IS RIGHT

Frey's syndrome occurs due to aberrant regeneration of auriculotemporal nerve fibers after parotid gland injury or surgery.

Parasympathetic fibers meant for salivation instead stimulate sweat glands, causing gustatory sweating and flushing over the preauricular area.

The other options describe features of Horner syndrome, not Frey's syndrome.

## QUESTION

A patient presents to the OPD with the right eye positioned downwards and rotated outwards. Which of the following cranial nerves is most likely injured?

A III

CORRECT

B IV

C VI

D VII

## RIGHT ANSWER

OK  
A. III

## WHY THIS IS RIGHT

The correct answer is Oculomotor nerve (CN III).

Injury to CN III causes unopposed action of lateral rectus (CN VI) and superior oblique (CN IV), resulting in the eye being positioned downward and outward.

Associated features include ptosis and dilated pupil due to loss of levator palpebrae and parasympathetic fibers.

## QUESTION

A patient presents with ptosis and ophthalmoplegia. The condition is diagnosed as Superior Orbital Fissure Syndrome. Which of the following cranial nerves are most likely compressed in this case?

A II, III, IV, VI

B II, III, IV, V1

C II, IV, V1, VI

D III, IV, V1, VI

CORRECT

## RIGHT ANSWER

OK

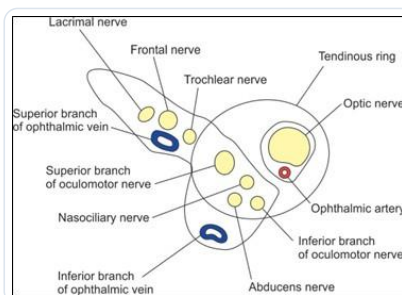
D. III, IV, V1, VI

## WHY THIS IS RIGHT

Superior orbital fissure syndrome involves compression of structures passing through the fissure, including oculomotor (III), trochlear (IV), ophthalmic division of trigeminal (V1), and abducens (VI) nerves.

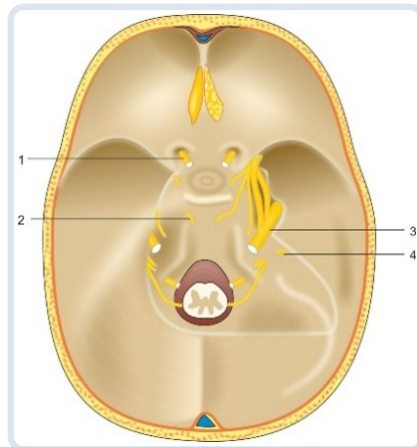
This explains ptosis and ophthalmoplegia due to involvement of extraocular muscle nerves.

The optic nerve (II) passes through the optic canal, not the superior orbital fissure.



## QUESTION

A patient presents with a unilateral throbbing headache, photophobia, and excessive lacrimation. He also complains of hemifacial pain on clenching of teeth. On examination, pupillary reflex, light reflex, and accommodation reflex are normal. Which of the following marked nerves is involved in the above scenario?



A 1

B 2

C 3

CORRECT

D 4

RIGHT ANSWER

OK

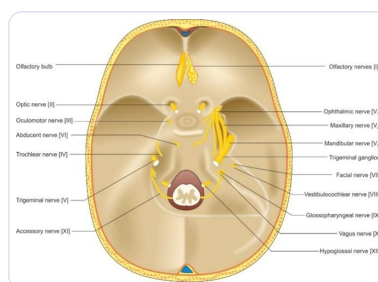
C. 3

## WHY THIS IS RIGHT

The clinical features-unilateral throbbing headache, photophobia, lacrimation, and hemifacial pain aggravated by clenching-point to involvement of the trigeminal nerve (CN V), the chief sensory nerve of the face.

Normal pupillary, light, and accommodation reflexes rule out oculomotor involvement.

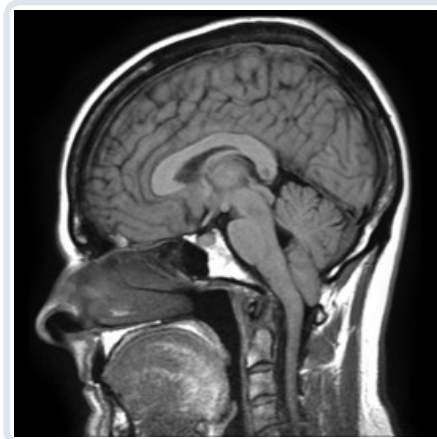
Thus, the marked nerve 3, corresponding to the trigeminal nerve, is responsible for facial pain and trigeminal autonomic symptoms.





## QUESTION

## | Diagnose the following MRI



- A** Corpus callosal agenesis
- B** Vein of Galen malformation
- C** Dandy Walker malformation

**D** Arnold Chiari malformation

CORRECT

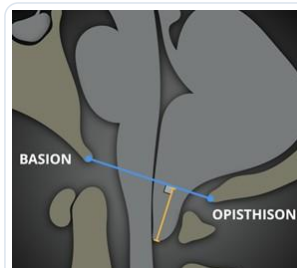
## RIGHT ANSWER

**OK** D. Arnold Chiari malformation

## WHY THIS IS RIGHT

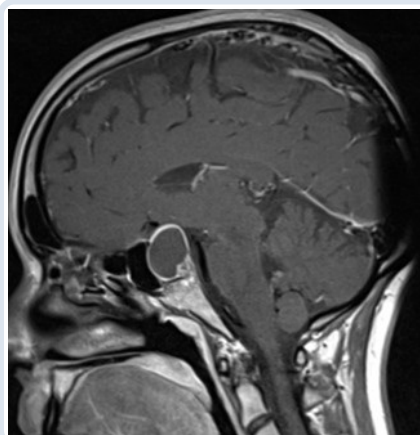
It is characterized by downward herniation of cerebellar tonsils through the foramen magnum, often with brainstem compression (defined as >5 mm below base of skull from basion-opisthion line)

Dandy-Walker malformation shows cystic dilatation of the 4th ventricle with enlarged posterior fossa, corpus callosal agenesis causes colpocephaly, and vein of Galen malformation is a vascular anomaly-not hindbrain herniation.



## QUESTION

A 35-year-old female presented with the following lesion. The abnormality seen following the lesion is:



A Single vision field loss

B Bitemporal hemianopia

CORRECT

C Complete blindness

D Homonymous hemianopia

## RIGHT ANSWER

OK

B. Bitemporal hemianopia

## WHY THIS IS RIGHT

A craniopharyngioma arises in the suprasellar region and commonly compresses the optic chiasm from below. This selectively damages the crossing nasal retinal fibers, resulting in loss of temporal visual fields of both eyes. Lesions posterior to the chiasm causes homonymous hemianopia, while complete blindness requires bilateral optic nerve damage.

## QUESTION

| The lesion in Brodmann's area 22 causes:

**A** Receptive aphasia

CORRECT

**B** Poor repetition of language

**C** Expressive aphasia

**D** Poor naming

## RIGHT ANSWER

**OK** A. Receptive aphasia

## WHY THIS IS RIGHT

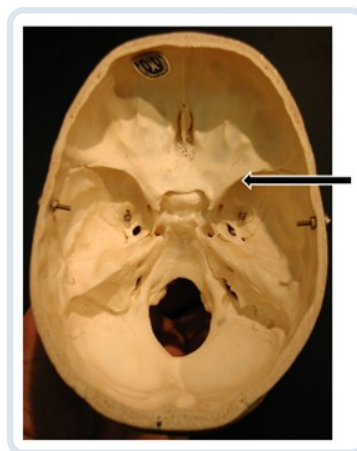
Brodmann area 22 corresponds to Wernicke's area in the dominant temporal lobe, responsible for language comprehension.

Lesions here cause fluent but meaningless speech with impaired understanding, i.e., receptive aphasia.

Expressive aphasia is due to Broca's area (areas 44-45), while repetition and naming deficits depend on other language network components.

## QUESTION

What will be the clinical presentation if the nerve passing through the marked region has been injured?



CORRECT

**A** Loss of sensation on forehead and dorsum of nose

**B** Loss of sensation in jaw area

**C** Loss of sensation in maxillary area of face

**D** Loss of sensation in the mucosa of nasopharynx

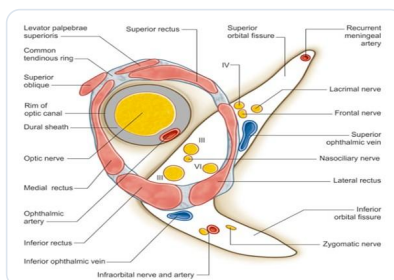
RIGHT ANSWER

**OK** **A. Loss of sensation on forehead and dorsum of nose**

## WHY THIS IS RIGHT

The nerve passing through the marked region is the ophthalmic division of trigeminal nerve (V1), which supplies forehead, scalp, upper eyelid, and dorsum of nose.

Maxillary area is supplied by V2, jaw area by V3, and nasopharyngeal mucosa mainly by V2/IX, not V1.



## QUESTION

Cranial nerve X carries multiple functional components. Which nucleus or functional group does not contribute fibers to the vagus nerve?

A GSE

CORRECT

B GSA

C GVE

D GVA

## RIGHT ANSWER

OK  
A. GSE

## WHY THIS IS RIGHT

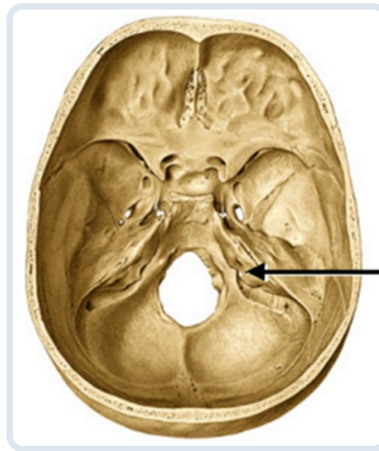
The correct answer is GSE (General Somatic Efferent).

The vagus nerve (CN X) carries GVE (parasympathetic) fibres from the dorsal motor nucleus, GVA fibres from thoracoabdominal viscera, and GSA fibres from the external auditory canal and dura.

Its motor fibres are branchial efferent (SVE) to muscles of pharynx and larynx, not true GSE, which supply extraocular and tongue muscles only.

## QUESTION

Which of the following nerves does not pass through the foramen indicated in the given image?



CORRECT

A XII

B IX

C XI

D X

## RIGHT ANSWER

OK

A. XII

## WHY THIS IS RIGHT

The marked foramen in the image is the jugular foramen, which is the second largest foramen of the skull (after the foramen magnum). The jugular foramen is located in the posterior cranial fossa between the petrous part of the temporal bone and the occipital bone.

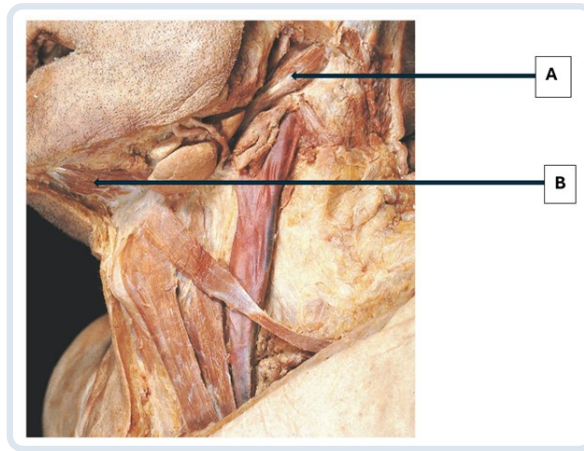
Three compartments of jugular foramen:

1. Anterior (Pars nervosa) - Contains:
  - o Inferior petrosal sinus (IPS)
2. Middle (Pars vascularis) - Contains:
  - o Glossopharyngeal nerve (CN IX)
  - o Vagus nerve (CN X)
  - o Accessory nerve (CN XI) - specifically the cranial root which joins the vagus
3. Posterior (Pars vascularis) - Contains:
  - o Internal jugular vein (IJV) - continuation of sigmoid sinus

The hypoglossal nerve (CN XII) does NOT pass through the jugular foramen. Instead, it passes through its own separate opening called the hypoglossal canal (anterior condylar canal), which is located anteriorly and medially to the jugular foramen, above the occipital condyle.

## QUESTION

In the given image, muscles A and B are labelled. Which of the following nerves supply the muscles A and B, respectively?



**A** Facial nerve & Nerve to mylohyoid

CORRECT

**B** Facial & Glossopharyngeal nerve

**C** Facial & Hypoglossus

**D** Facial & Vagus

## RIGHT ANSWER

OK

**A. Facial nerve & Nerve to mylohyoid**

## WHY THIS IS RIGHT

The cadaveric image shows the digastric muscle, which is a unique "hybrid muscle" of the neck with dual innervation:

- Muscle A (Anterior belly of digastric): This muscle is derived from the first pharyngeal arch and is supplied by the mandibular nerve (V3), specifically through the nerve to mylohyoid branch. The nerve to mylohyoid runs along the mylohyoid muscle and sends a branch to innervate the anterior belly of the digastric.
- Muscle B (Posterior belly of digastric): This muscle is derived from the second pharyngeal arch and is supplied by the facial nerve (CN VII), specifically through the digastric branch of the facial nerve that arises near the stylomastoid foramen.

The digastric muscle is classified as a hybrid muscle because its two bellies have different embryological origins and nerve supplies:

- First arch -> Mandibular nerve (V3) -> Nerve to mylohyoid -> Anterior belly
- Second arch -> Facial nerve (CN VII) -> Posterior belly

## QUESTION

A patient cannot identify objects but she can see the colour, texture, shape. What is the site of the lesion?

A Medial parietal area

B Lateral parietal area

C Infra temporal area

D Occipital area

CORRECT

## RIGHT ANSWER

OK D. Occipital area

## WHY THIS IS RIGHT

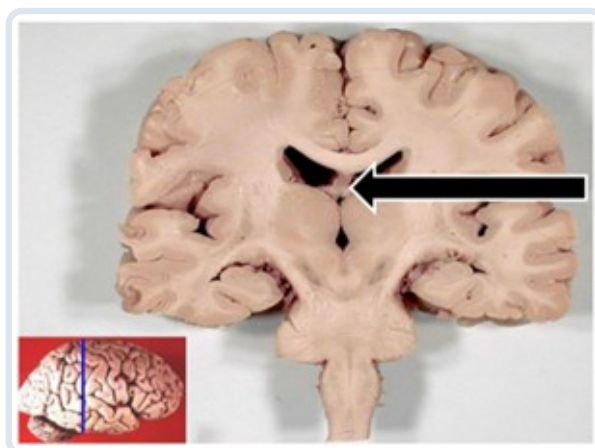
The clinical picture is visual agnosia-vision is intact (colour, shape, texture perceived) but object recognition is impaired. This occurs due to lesions in visual association cortex (Brodmann areas 18 and 19) of the occipital lobe, not the primary visual cortex (area 17).

Parietal areas are involved in spatial perception, and infratemporal lesions cause visual memory/face recognition deficits rather than basic object agnosia.



## QUESTION

Efferent to which nucleus of thalamus from indicated structure in the image?



**A** Anterior

CORRECT

**B** Lateral

**C** Ventro-postero-lateral

**D** Pulvinar

RIGHT ANSWER

OK

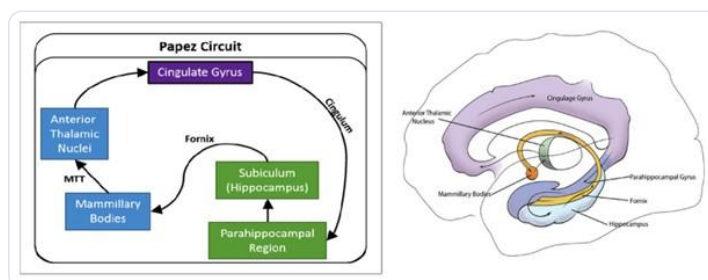
**A. Anterior**

## WHY THIS IS RIGHT

The correct answer is Anterior nucleus of thalamus.

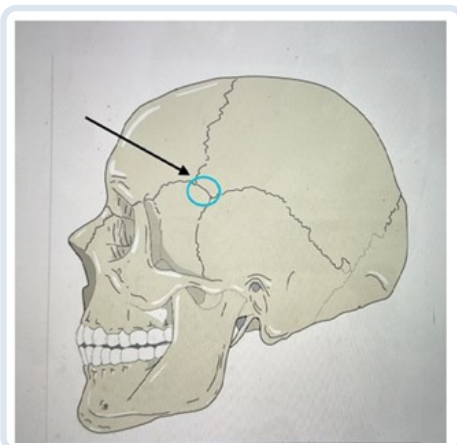
The indicated structure is the fornix, which carries efferent fibres from the hippocampus to the mammillary bodies.

From the mammillary bodies, impulses are relayed via the mammillothalamic tract to the anterior thalamic nucleus as part of the Papez circuit for memory.



## QUESTION

| The sulcus located deep to the marked structure is?



- A Central sulcus
- B Stem of the lateral sulcus**
- C Inferior frontal sulcus
- D Superior temporal sulcus

CORRECT

## RIGHT ANSWER

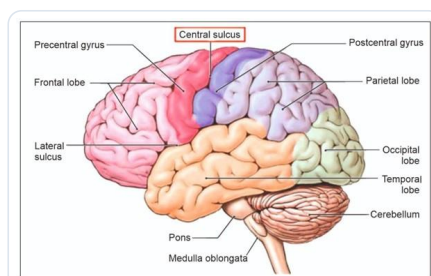
- B. Stem of the lateral sulcus**

## WHY THIS IS RIGHT

The marked structure corresponds to the pterion, which overlies the stem of the lateral (Sylvian) sulcus on the cerebral surface.

Deep to this region lie the insula and proximal Sylvian fissure, making the stem of the lateral sulcus the key anatomical relation.

Central sulcus and frontal/temporal sulci are positioned more superiorly or posteriorly and are not directly related to the pterion.



QUESTION

Which type of sensation is carried by the 2nd order neuron of the spinal nucleus of the trigeminal nerve?

- A Proprioception
- B Touch
- C Pain
- D Vibration

CORRECT

RIGHT ANSWER

OK C. Pain

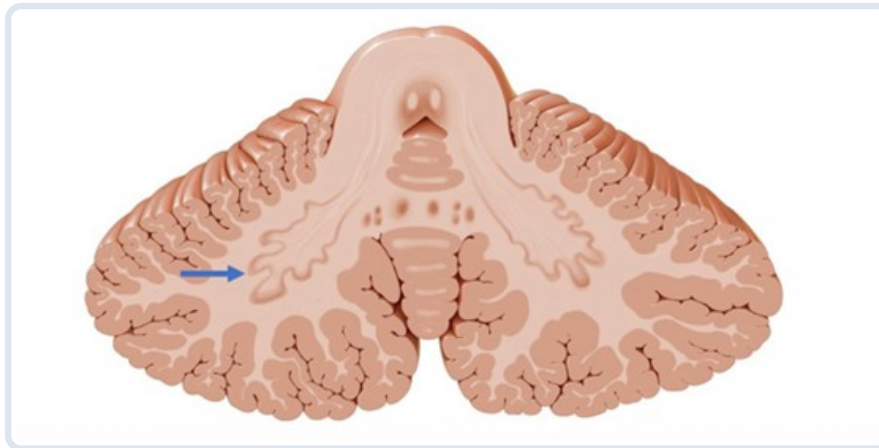
WHY THIS IS RIGHT

No explanation was provided in the source quiz.

| Sensory Nucleus                                 | Location | Function                                  |
|-------------------------------------------------|----------|-------------------------------------------|
| Mesencephalic Nucleus of Trigeminal Nerve (MNT) | Midbrain | Proprioception from jaw muscles and teeth |
| Chief Sensory Nucleus of Trigeminal Nerve (CNT) | Pons     | Touch and pressure sensation from face    |
| Spinal Nucleus of Trigeminal Nerve (SNT)        | Medulla  | Pain and temperature sensation from face  |

## QUESTION

**| Indicated structure gives origin to which of the following fibre?**



- A** Cerebello-rubral
- B** Cerebello-reticular
- C** Cerebello-vestibular
- D** Dentato-rubral

CORRECT

## RIGHT ANSWER

**OK** **D. Dentato-rubral**

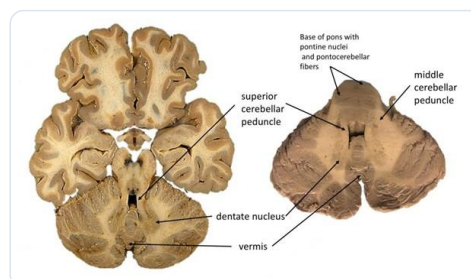
## WHY THIS IS RIGHT

The correct answer is Dentato-rubral.

The indicated structure is the dentate nucleus, the largest deep cerebellar nucleus and the main output nucleus of the cerebellar hemispheres.

Fibers from the dentate nucleus pass through the superior cerebellar peduncle, decussate, and project to the contralateral red nucleus as dentato-rubral fibers.

Cerebello-reticular and cerebello-vestibular fibers arise mainly from the fastigial nucleus, while cerebello-rubral is a broader term, with dentato-rubral being the precise anatomical pathway.



## QUESTION

**Marked structure is connected to which part of basal nuclei?**



- A** Thalamus
- B** Subthalamic nucleus
- C** Globus pallidum
- D** **Corpus striatum**

CORRECT

## RIGHT ANSWER

OK

**D. Corpus striatum**

## WHY THIS IS RIGHT

The correct answer is Corpus striatum.

The marked structure is the substantia nigra, which is connected to the corpus striatum (caudate + putamen) via the nigrostriatal dopaminergic pathway, essential for motor control.

Degeneration of this pathway leads to Parkinson disease.

Thalamus and subthalamic nucleus are relay/modulatory nuclei, while globus pallidum is an output nucleus, not the primary nigral connection.

## QUESTION

| Structure lying in the floor of inferior horn of lateral ventricle are all except?

A Collateral eminence

B Hippocampus

C Fimbria

D Tail of caudate nucleus

CORRECT

## RIGHT ANSWER

OK D. Tail of caudate nucleus

## WHY THIS IS RIGHT

The correct answer is Tail of caudate nucleus.

The floor of the inferior (temporal) horn of the lateral ventricle is formed by the hippocampus, fimbria, and collateral eminence.

The tail of the caudate nucleus runs in the roof of the inferior horn, along with the stria terminalis, and therefore is not a floor structure.

## QUESTION

| Which nerve is not the content of superior orbital fissure?

A II

CORRECT

B III

C IV

D VI

## RIGHT ANSWER

OK

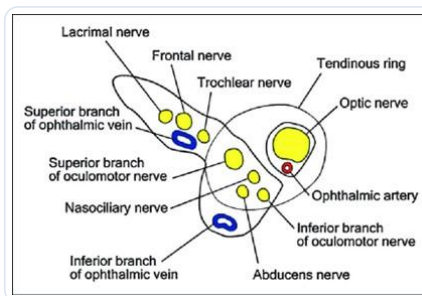
A. II

## WHY THIS IS RIGHT

The correct answer is Optic nerve (CN II).

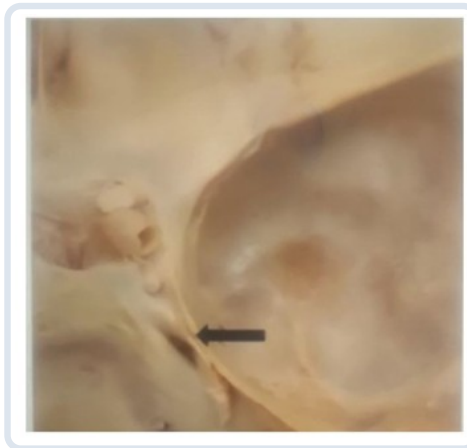
CN II passes through the optic canal, not the superior orbital fissure.

The superior orbital fissure transmits CN III, CN IV, CN VI, and the ophthalmic division of CN V (V1) along with sympathetic fibres.



## QUESTION

| Which nerve does the marked structure contain?



- A III
- B IV
- C VI
- D Ophthalmic division

CORRECT

RIGHT ANSWER

OK

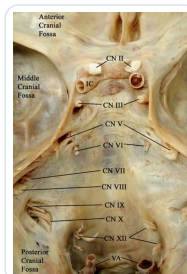
B. IV

## WHY THIS IS RIGHT

The correct answer is Trochlear nerve (CN IV).

The marked structure is the superior orbital fissure, and CN IV uniquely runs in the lateral wall of the cavernous sinus and passes through the superior orbital fissure outside the common tendinous ring.

CN III, CN VI, and the ophthalmic division of CN V traverse different compartments or positions within the fissure, helping differentiate CN IV in image-based questions.





## QUESTION

**I Olfactory sensation is transmitted by all of the following nerves, except:**

- A** Trigeminal nerve
- B** Glossopharyngeal nerve
- C** Hypoglossal nerve
- D** Vagus nerve

CORRECT

## RIGHT ANSWER

- OK** **C. Hypoglossal nerve**

## WHY THIS IS RIGHT

CN XII is a purely motor nerve supplying intrinsic and extrinsic muscles of the tongue, with no sensory component. Trigeminal, glossopharyngeal, and vagus nerves contribute general sensory input (irritant, pungent stimuli) that modulates perceived olfactory sensation, but CN XII has no such role.

## QUESTION

A woman has a difficulty opening her mouth but no problem in closing it. Which of the following is true about the muscle affected in the condition?

1. The muscle attaches close to the temporal mandibular joint.
2. The muscle depresses the mandible.
3. It is attached to the medial pterygoid plate.
4. The muscle is supplied by the mandibular nerve.

A 1, 2, 3, and 4

B 1, 2, and 4

CORRECT

C 1, 3, and 4

D 2, 3, and 4

## RIGHT ANSWER

OK

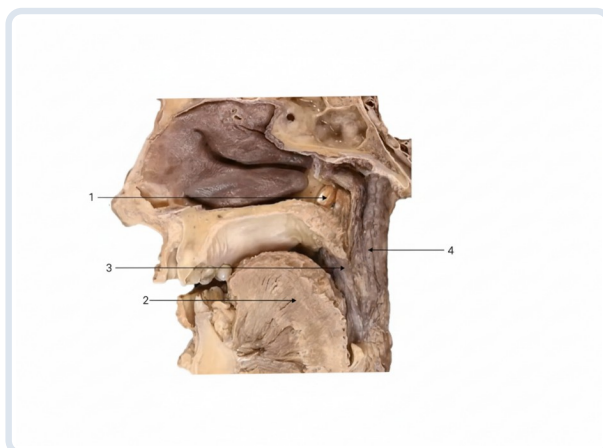
B. 1, 2, and 4

## WHY THIS IS RIGHT

Difficulty in opening the mouth indicates paralysis of a mandible depressor, mainly the lateral pterygoid muscle. Lateral pterygoid attaches near the TMJ (neck of mandible and articular disc) and is responsible for depression and protrusion of mandible. It is supplied by the mandibular nerve (V3), but it is not attached to the medial pterygoid plate (that is medial pterygoid), Lateral pterygoid arises from- greater wing of sphenoid & Lateral pterygoid plate.

## QUESTION

Which of these muscles have no role to play in dysphasia or dysarthria?



A 1

B 2

CORRECT

C 3

D 4

RIGHT ANSWER

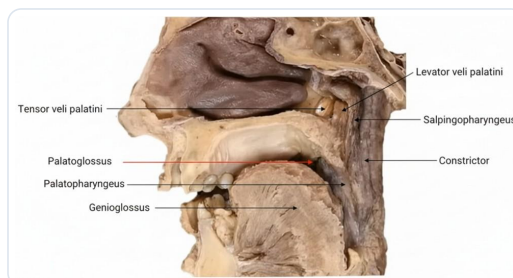
OK B. 2

## WHY THIS IS RIGHT

The correct answer is Option B- Genioglossus muscle.

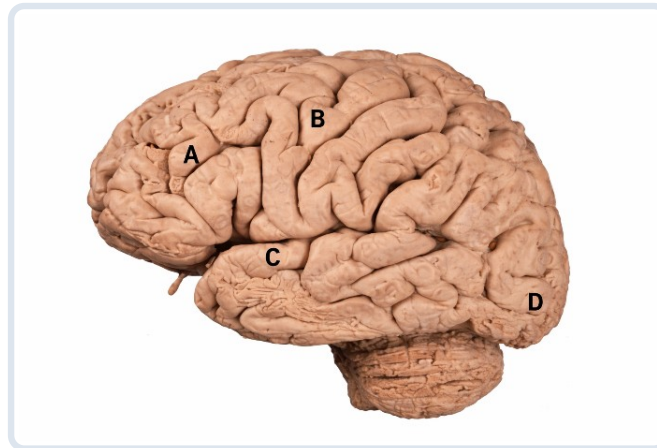
Genioglossus is primarily responsible for protrusion and depression of the tongue and helps prevent airway obstruction, not fine articulation.

Dysarthria and dysphasia mainly involve muscles of the soft palate and pharynx (tensor veli palatini, palatoglossus, palatopharyngeus) that coordinate speech and swallowing.



## QUESTION

Which of the following area is responsible for scanning the visual field?



A A

CORRECT

B B

C C

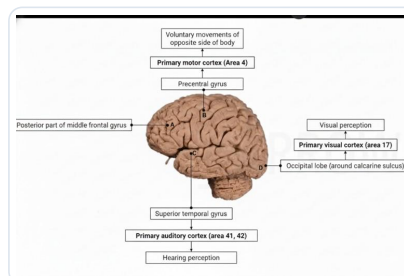
D D

RIGHT ANSWER

OK A. A

## WHY THIS IS RIGHT

Area A corresponds to the frontal eye field (Brodmann area 8). It controls voluntary conjugate eye movements and is responsible for scanning ocular activity. Lesion causes inability to look voluntarily to the contralateral side, with eyes deviated toward the lesion.



## QUESTION

A patient presents with a drooping of the eyelid, miosis and anhidrosis. A diagnosis of Horner syndrome is made. Where is the lesion most likely located?

A Sympathetic plexus around the internal carotid artery

B Cervical sympathetic chain

CORRECT

C Abducens nerve

D Intercostobrachial nerve

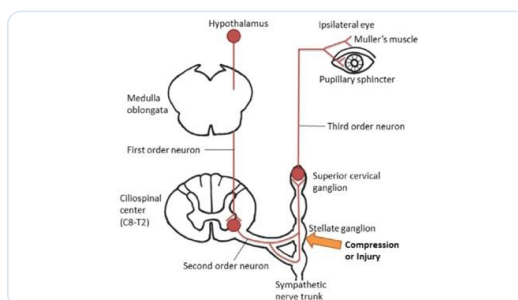
## RIGHT ANSWER

OK B. Cervical sympathetic chain

## WHY THIS IS RIGHT

Horner syndrome results from interruption of the sympathetic pathway supplying the eye, commonly at the cervical sympathetic chain.

Lesion causes ipsilateral ptosis, miosis, and anhidrosis due to loss of postganglionic sympathetic fibres.



## QUESTION

| The marked structure forms the medial wall of which of the following?



- A Third ventricle
- B Fourth ventricle
- C Lateral ventricle**
- D Cisterna magna

CORRECT

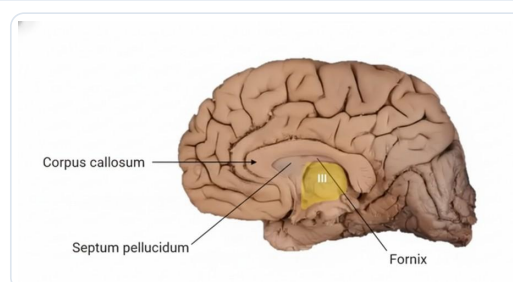
RIGHT ANSWER

OK

**C. Lateral ventricle**

## WHY THIS IS RIGHT

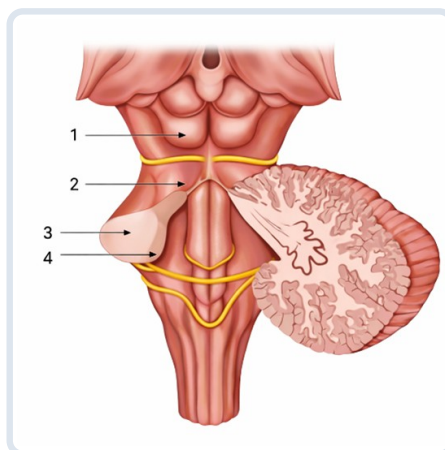
The marked structure is the septum pellucidum, which forms the medial wall of the lateral ventricle. Septum pellucidum is a thin vertical membrane located just below the corpus luteum and above the fornix, it separates the two lateral ventricles from each other. Third ventricle walls are formed by thalamus and hypothalamus, not septum pellucidum.



## QUESTION

Match the following to the corresponding labels in the image.

- a. Inferior cerebellar peduncle
- b. Superior cerebellar peduncle
- c. Inferior colliculus
- d. Middle cerebellar peduncle
- e. Inferior brachium



**A** 1-c, 2-b, 3-d, 4-a

CORRECT

**B** 1-b, 2-d, 3-a, 4-c

**C** 1-d, 2-c, 3-e, 4-b

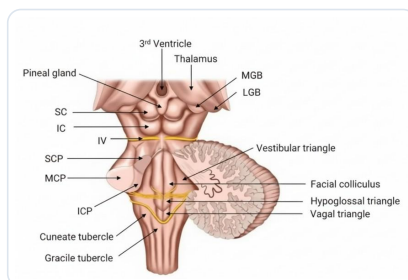
**D** 1-a, 2-e, 3-b, 4-d

## RIGHT ANSWER

**OK** A. 1-c, 2-b, 3-d, 4-a

## WHY THIS IS RIGHT

Inferior colliculus lies on the dorsal midbrain, superior cerebellar peduncle connects cerebellum to midbrain, and middle cerebellar peduncle is the largest cerebellar peduncle connecting pons to cerebellum. Inferior cerebellar peduncle connects medulla to cerebellum, completing the correct anatomical matching. Inferior brachium - not separately labelled here, connects inferior colliculus to medial geniculate body (auditory pathway).



## QUESTION

A patient presents with a fish bone lodged in the pyriform fossa. During the removal procedure, a nerve located in this region is injured. Which of the following nerves is most likely involved?

A ELN

B ILN

CORRECT

C RLN

D IX

## RIGHT ANSWER

OK

B. ILN

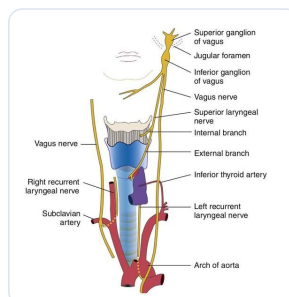
## WHY THIS IS RIGHT

The correct answer is Internal laryngeal nerve (ILN).

The pyriform fossa mucosa is supplied by the internal laryngeal nerve, a branch of the superior laryngeal nerve, providing sensory innervation above the vocal cords.

Injury here leads to loss of sensation and cough reflex, explaining the clinical relevance during foreign body removal.

The external laryngeal nerve is motor, RLN supplies structures below the vocal cords, and glossopharyngeal nerve supplies the oropharynx, not the pyriform fossa.





## QUESTION

A patient presents with swelling below the left earlobe and is experiencing pain. What is the most likely cause of this pain?

- A Facial nerve
- B Investing layer of deep cervical fascia
- C Auriculotemporal nerve

**D Greater auricular nerve**

CORRECT

## RIGHT ANSWER

**OK** D. Greater auricular nerve

## WHY THIS IS RIGHT

Swelling below the earlobe commonly involves the parotid region, where pain sensation is carried by the greater auricular nerve (C2-C3). This nerve supplies the skin over the parotid gland, angle of mandible, and lower auricle. Facial nerve is motor, auriculotemporal nerve carries secretomotor fibers and sensory supply to temple, and fascia itself is not a pain-transmitting structure.

## QUESTION

A student got his jaw locked while yawning. Identify the muscle attached to the articular disc of the temporomandibular joint?

**A** Lateral pterygoid

CORRECT

**B** Temporalis

**C** Medial pterygoid

**D** Masseter

## RIGHT ANSWER

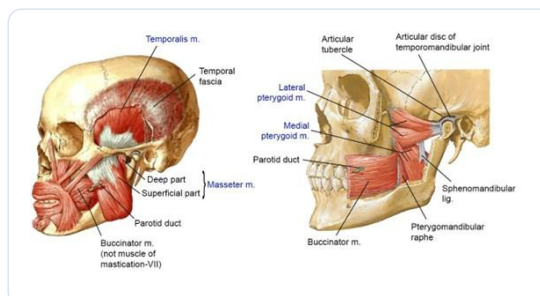
**OK** A. Lateral pterygoid

## WHY THIS IS RIGHT

The lateral pterygoid muscle inserts into the neck of mandible and the articular disc of the TMJ, controlling disc movement during mouth opening.

Excessive contraction during yawning can displace the disc, leading to jaw locking.

Temporalis, medial pterygoid, and masseter attach to the mandible but do not insert into the articular disc.



## QUESTION

**I Injury to which nerve results in absent gag reflex?**

**A** VII & X

**B** IX & X

CORRECT

**C** V & IX

**D** VII & IX

## RIGHT ANSWER

**OK** B. IX & X

## WHY THIS IS RIGHT

The afferent limb of the gag reflex is mediated by the glossopharyngeal nerve (CN IX) from the posterior pharynx. The efferent limb is carried by the vagus nerve (CN X) supplying the pharyngeal muscles. Injury to either nerve can abolish the gag reflex.

## QUESTION

| Paralysis of which muscle causes ptosis in Horner syndrome?

- A** Orbitalis
- B** Levator superioris palpebrae
- C** Orbicularis Oculi
- D** Superior tarsal muscle

CORRECT

## RIGHT ANSWER

- OK** **D. Superior tarsal muscle**

## WHY THIS IS RIGHT

Ptosis in Horner syndrome is due to paralysis of the superior tarsal (Müller's) muscle, which is a sympathetically innervated smooth muscle.

This causes mild ptosis, unlike complete ptosis from levator palpebrae superioris (CN III) palsy. Orbicularis oculi closes the eyelid, and orbitalis has no role in eyelid elevation.

## QUESTION

During resection of the submandibular gland along with its duct, which of the following structure lying below the duct is most likely to be injured during the procedure?

A Marginal mandibular nerve

B Facial artery

C Hypoglossal nerve

CORRECT

D Trigeminal nerve

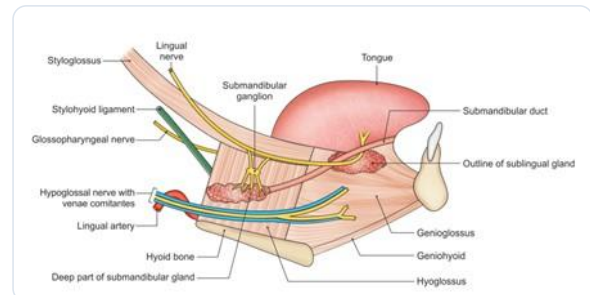
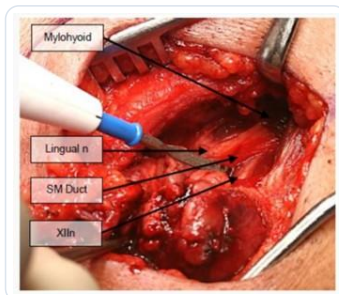
## RIGHT ANSWER

OK C. Hypoglossal nerve

## WHY THIS IS RIGHT

During submandibular gland resection with removal of the submandibular duct (Wharton's duct), the nerve most at risk below the duct is the hypoglossal nerve (CN XII).

During submandibular gland surgery, the hypoglossal nerve (CN XII) runs below and deep to the submandibular duct (on the hyoglossus muscle) and is at risk of injury during deep dissection. The lingual nerve has a characteristic lateral-below-medial (LBM) relationship with the duct and is also at risk. Injury to the hypoglossal nerve results in ipsilateral tongue paralysis with deviation toward the side of the lesion.



## QUESTION

| Blood supply for the red shaded area in the given image is a branch of which artery?



A Superior cerebellar artery

B Posterior cerebral artery

C Vertebral artery

CORRECT

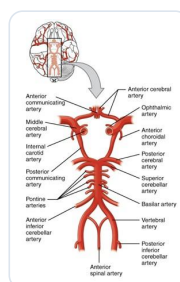
D Basilar artery

## RIGHT ANSWER

OK C. Vertebral artery

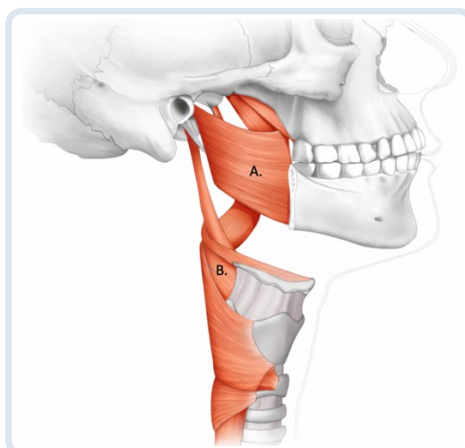
## WHY THIS IS RIGHT

The red shaded area represents the lateral medulla, which is supplied by the posterior inferior cerebellar artery (PICA). PICA is a branch of the vertebral artery and its occlusion causes lateral medullary (Wallenberg) syndrome. Superior cerebellar artery arises from basilar artery, posterior cerebral artery supplies midbrain and occipital lobe, and basilar artery itself does not directly supply this lateral medullary region.



## QUESTION

Identify the structure passing between marked points A and B



A Palatopharyngeus

B Stylopharyngeus

CORRECT

C Stylohyoid

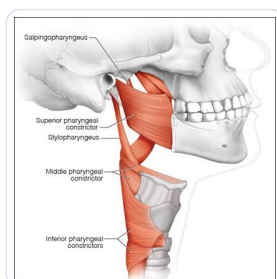
D Mylohyoid

## RIGHT ANSWER

OK B. Stylopharyngeus

## WHY THIS IS RIGHT

The stylopharyngeus muscle passes between the superior and middle pharyngeal constrictors, and it is innervated by the glossopharyngeal nerve (cranial nerve IX).



| Gap                                                                                            | Structures Passing Through                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Between the base of skull and upper concave border of superior constrictor (sinus of Morgagni) | <ul style="list-style-type: none"> <li>Auditory tube</li> <li>Levator palatini muscle</li> <li>Ascending palatine artery</li> <li>Palatine branch of ascending pharyngeal artery</li> </ul> |
| Between the superior and middle constrictors                                                   | <ul style="list-style-type: none"> <li>Stylopharyngeus muscle</li> <li>Glossopharyngeal nerve</li> </ul>                                                                                    |
| Between the middle and inferior constrictors                                                   | <ul style="list-style-type: none"> <li>Internal laryngeal nerve</li> <li>Superior laryngeal vessels</li> </ul>                                                                              |
| Between the lower border of inferior constrictor and oesophagus (in tracheoesophageal groove)  | <ul style="list-style-type: none"> <li>Recurrent laryngeal nerve</li> <li>Inferior laryngeal vessels</li> </ul>                                                                             |

## QUESTION

After parotidectomy, lower lip paralysis was seen in a patient. Which of the following part of facial nerve was involved?

- A Parotid duct
- B Temporal branch of facial nerve
- C Cervical branch of facial nerve**
- D Main trunk of facial nerve

CORRECT

## RIGHT ANSWER

- OK
- C. Cervical branch of facial nerve**

## WHY THIS IS RIGHT

The cervical branch of the facial nerve is responsible for innervating the platysma muscle, which is crucial for controlling lower lip movements. During a parotidectomy, if this branch is damaged, it can lead to paralysis of the lower lip.



## QUESTION

A patient not able to chew the food and food stuck between cheeks and teeth. Which muscle weakness is associated with this clinical condition?

**A** Buccinator

CORRECT

**B** Orbicularis oris

**C** Zygomaticus major

**D** Levator labi superioris

## RIGHT ANSWER

**OK** A. Buccinator

## WHY THIS IS RIGHT

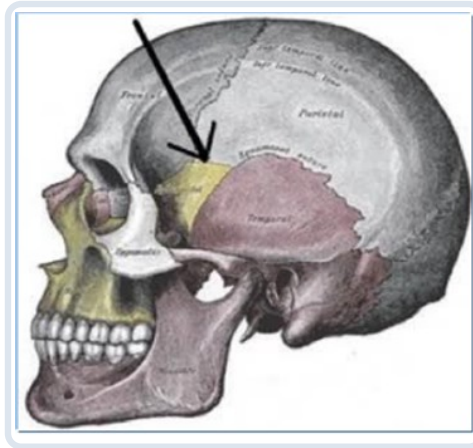
The correct answer is Buccinator.

Buccinator compresses the cheek against the teeth, preventing food from accumulating in the vestibule during mastication.

Weakness leads to food getting trapped between cheek and teeth, a classic sign seen in facial nerve palsy.

## QUESTION

| Structure which is related deep to marked structure?



**A** Stem of lateral sulcus

CORRECT

**B** ICA Siphon

**C** Wernicke's area

**D** Pineal gland

## RIGHT ANSWER

OK

**A. Stem of lateral sulcus**

## WHY THIS IS RIGHT

The correct answer is Stem of the lateral sulcus.

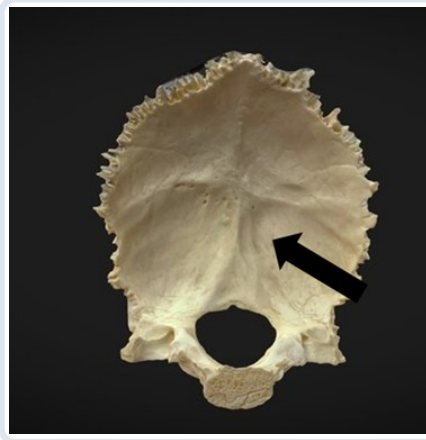
Pterion (junction of frontal, parietal, sphenoid, temporal bones) overlies the anterior branch of the middle meningeal artery and corresponds deep to the stem of the lateral (Sylvian) sulcus.

Structures deep to the pterion (from outside -> inside):

- i. Anterior branch of middle meningeal artery
  - ii. Dura mater
  - iii. Subdural space
  - iv. Arachnoid mater
  - v. Subarachnoid space with CSF
  - vi. Stem of the lateral (Sylvian) sulcus
- Insular cortex (deepest cortical structure)

## QUESTION

Pain originating from the marked structure is typically referred to which of the following locations?



A Ear

B Back of neck

CORRECT

C Vertex

D Shoulder

RIGHT ANSWER

OK

B. Back of neck

## WHY THIS IS RIGHT

The marked structure lies in the posterior cranial fossa near the occipital bone/venous sinuses, whose dura is supplied by upper cervical nerves (C2-C3).

Pain from this region is therefore referred to the occipital region and back of the neck.

## QUESTION

A woman develops choking, hoarseness of voice, and a foreign body sensation in the throat while eating fish. Examination reveals a fish bone lodged in the pyriform fossa. Which nerve is primarily responsible for mediating this irritation?

A IX

B RLN

C Internal branch of SLN

CORRECT

D External branch of SLN

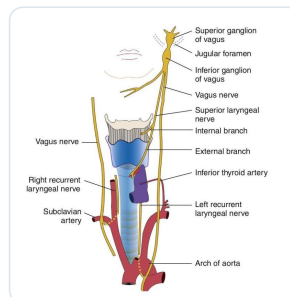
## RIGHT ANSWER

OK

C. Internal branch of SLN

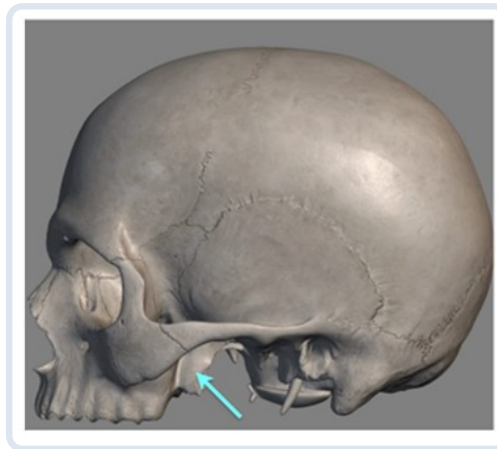
## WHY THIS IS RIGHT

The correct answer is Internal branch of the superior laryngeal nerve (SLN). The pyriform fossa mucosa is supplied by the internal laryngeal nerve, which carries sensory fibres above the vocal cords. Irritation here causes foreign body sensation, choking, and cough reflex. Glossopharyngeal nerve supplies oropharynx, while RLN and external SLN are motor and do not mediate this sensory irritation.



## QUESTION

What is the primary function of the muscle attached at the marked point in the given image?



- A Elevation
- B Depression
- C Retraction
- D Rotation

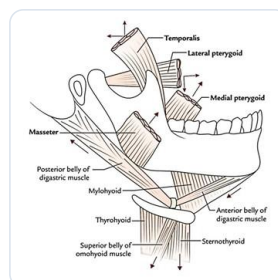
CORRECT

RIGHT ANSWER

OK B. Depression

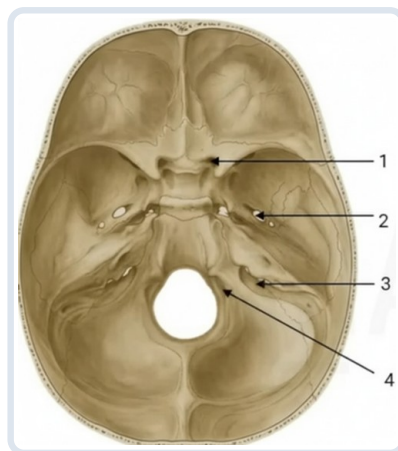
## WHY THIS IS RIGHT

The marked point in the image indicates the lateral pterygoid plate of the sphenoid bone. The muscle attached to the lateral surface of the lateral pterygoid plate is the lateral pterygoid muscle.



## QUESTION

Through which of the following foramen does the nerve supplying the muscle of mastication passes?



A 1

B 2

CORRECT

C 3

D 4

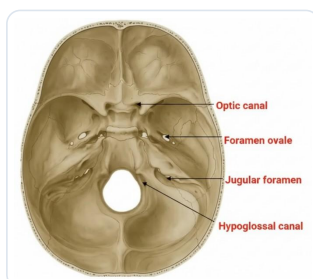
RIGHT ANSWER

OK

B. 2

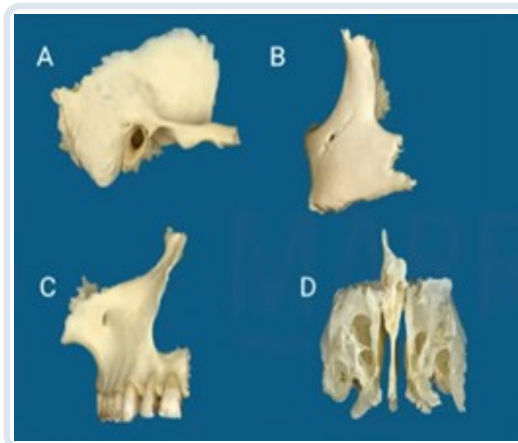
## WHY THIS IS RIGHT

The muscles of mastication are supplied by the mandibular nerve (V3), it is the only motor division of the trigeminal nerve. V3 exits the cranial cavity through the foramen ovale to enter the infratemporal fossa. Optic canal transmits CN II, jugular foramen transmits CN IX-XI, and hypoglossal canal transmits CN XII, none of which supply muscles of mastication.



## QUESTION

| Which of the following bone contains the cranial nerve related directly to CNS?



A A

B B

C C

D D

CORRECT

RIGHT ANSWER

OK D. D

## WHY THIS IS RIGHT

The correct answer is D (Ethmoid bone).

The ethmoid bone contains the cribriform plate, which is perforated by multiple foramina transmitting the olfactory nerve filaments (cranial nerve I) from the nasal mucosa to the olfactory bulb.

The olfactory bulb and tract are outgrowths of the forebrain (telencephalon), making CN I the only cranial nerve directly connected to the CNS without an intervening peripheral ganglion.

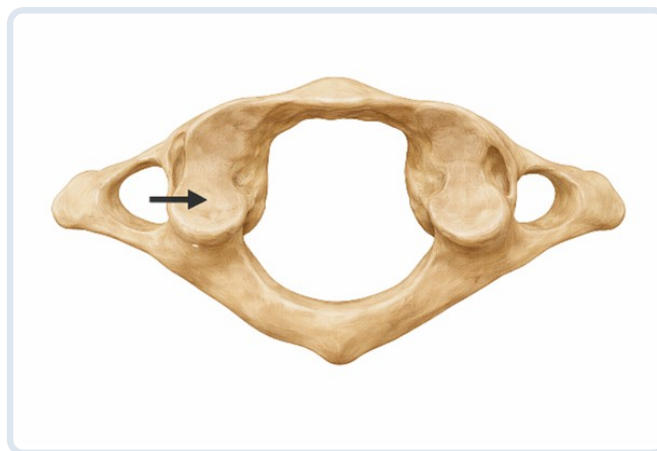
Cranial nerves directly related to CNS:

- CN I -> through cribriform plate (Ethmoid)
- CN II -> through optic canal (Sphenoid)

In contrast, the temporal bone (A) transmits CN VII and VIII, the zygomatic bone (B) transmits branches of CN V2, and the maxilla (C) transmits branches of CN V2-none of which have direct CNS continuity.

## QUESTION

Identify the structure that the marked structure in the given image of atlas vertebra articulates with.



**A** Occipital

CORRECT

**B** Sacrum

**C** Axis

**D** Sphenoid

RIGHT ANSWER

OK

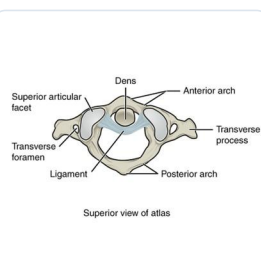
**A. Occipital**

## WHY THIS IS RIGHT

The marked structure is the superior articular facet of the atlas (C1).

Atlas had large vertebral foramen, kidney-shaped superior articular facets, concave, and articulates with the occipital condyles to form the atlanto-occipital joint.

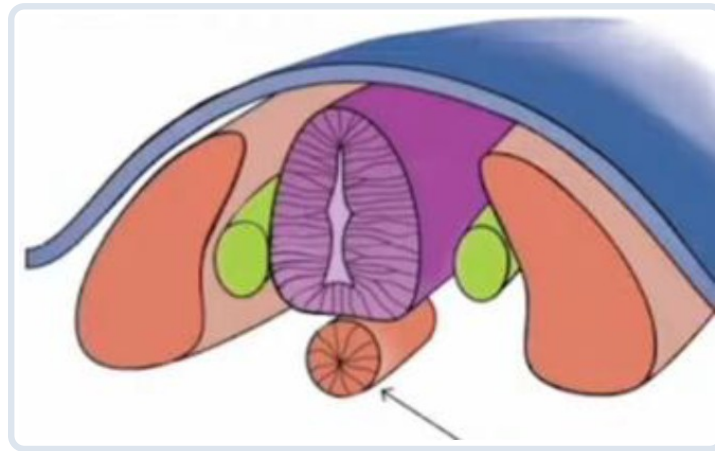
This joint permit flexion-extension movements of the head ("yes" nodding movement).





## QUESTION

The marked embryonic structure in the image eventually gives rise to which of the following adult structure?



- A** Vertebra
- B** Spinal cord
- C** Nucleus pulposus of intervertebral disc
- D** Annulus fibrosus of intervertebral disc

CORRECT

## RIGHT ANSWER

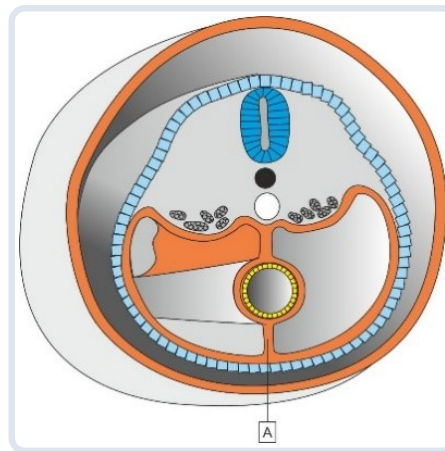
- OK** **C. Nucleus pulposus of intervertebral disc**

## WHY THIS IS RIGHT

The marked embryonic structure is the notochord, which persists in the adult as the nucleus pulposus. The annulus fibrosus is derived from surrounding mesenchyme (sclerotome), while vertebrae form from sclerotome and the spinal cord from neural tube.

## QUESTION

The structure marked A in the image below gives rise to which of the following structures?



A Gastrosplenic ligament

B Lienorenal ligament

C Falciform ligament

CORRECT

D Gastrophrenic ligament

RIGHT ANSWER

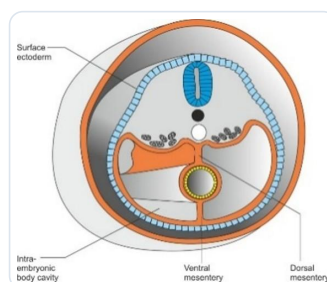
OK

C. Falciform ligament

## WHY THIS IS RIGHT

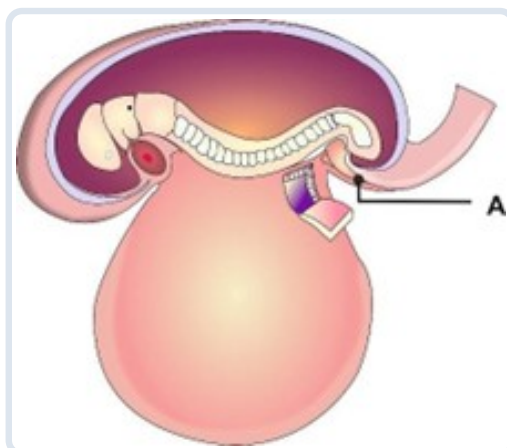
The marked structure is the ventral mesogastrium, which gives rise to the falciform ligament and lesser omentum.

In contrast, the gastrosplenic, lienorenal, and gastrophrenic ligaments are derivatives of the dorsal mesogastrium.



## QUESTION

Mark the option which develops from the structure marked A?



A Medial umbilical ligament

B Median umbilical ligament

CORRECT

C Meckel's diverticulum

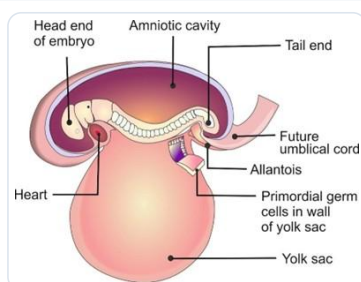
D Ligamentum teres

## RIGHT ANSWER

OK B. Median umbilical ligament

## WHY THIS IS RIGHT

Marked structure A is the allantois, which forms the urachus, which in turn gives rise to the median umbilical ligament.

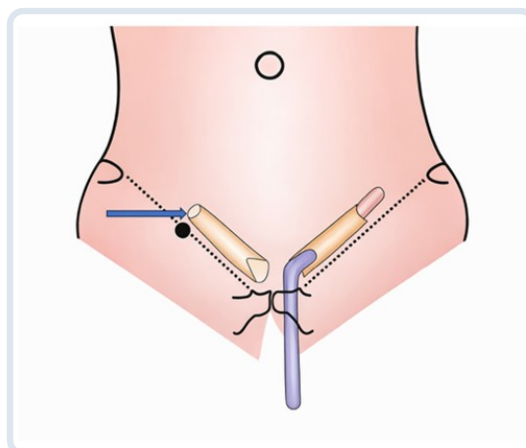


## Educational objective

| FETAL STRUCTURE        | DERIVATIVE                                         | POINTS                                                       |
|------------------------|----------------------------------------------------|--------------------------------------------------------------|
| Ductus Arteriosus      | Ligamentum Arteriosum                              | Located near Lt. recurrent laryngeal Nerve                   |
| Ductus Venosus         | Ligamentum Venosum                                 |                                                              |
| Foramen Ovale          | Fossa Ovalis                                       |                                                              |
| Allantois □<br>Urachus | Median Umbilical Ligament                          | Urachus is a part of allantois between bladder and umbilicus |
| Umbilical Artery       | Medial Umbilical Ligament                          |                                                              |
| Umbilical Vein         | Ligamentum Teres Hepatis (Round ligament of liver) | Contained within falciform ligament                          |

## QUESTION

| A defect in which of the following forms the structure marked below?



A Internal oblique

B External oblique

C Parietal peritoneum

D Fascia transversalis

CORRECT

## RIGHT ANSWER

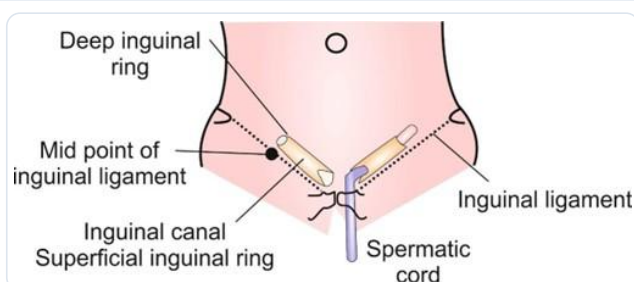
OK D. Fascia transversalis

## WHY THIS IS RIGHT

Marked structure is the deep inguinal ring, formed by a defect in fascia transversalis.

The deep inguinal ring is an opening in the transversalis fascia present 1 cm above the inguinal ligament, midway between the anterior superior iliac spine and the pubic symphysis.

An indirect inguinal hernia arises through the deep inguinal ring, lateral to the inferior epigastric vessel.



## QUESTION

| Covering of an omphalocele is derived from which of the following structures?

A Endoderm

B Mesoderm

C Chorion

D Amnion

CORRECT

## RIGHT ANSWER

OK D. Amnion

## WHY THIS IS RIGHT

In omphalocele, herniated abdominal contents are covered by a membrane composed of amnion externally and peritoneum internally.

This differentiates it from gastroschisis, where there is no covering membrane.

Endoderm and mesoderm form gut and body wall structures, not the external covering.

| Feature | Omphalocele | Gastroschisis |  
| ----- | ----- | ----- |  
| Midline | Yes | Usually right-sided |  
| Covered by sac | Yes | No |  
| Sac layer | Amnion | None |  
| Associated anomalies | Common | Rare |

## QUESTION

**| Fecal discharge from the umbilicus is seen in which of the following conditions?**

**A** Gastroschisis

**B** Urachal fistula

**C** Omphalocele

**D** Ileal diverticulum

CORRECT

## RIGHT ANSWER

OK

**D. Ileal diverticulum**

## WHY THIS IS RIGHT

A patent vitellointestinal duct associated with Meckel's (ileal) diverticulum can present with fecal discharge from the umbilicus.

Vitellointestinal (Omphalomesenteric) duct-Connects midgut to yolk sac, normally obliterates

Urachus-Connects bladder to umbilicus, becomes median umbilical ligament

Urachal fistula causes urine discharge, while gastroschisis and omphalocele are anterior abdominal wall defects without fecal umbilical discharge.

A) Gastroschisis

Abdominal wall defect

Bowel protrudes

No fecal discharge from umbilicus

B) Urachal fistula

Persistent urachus

Causes urine discharge, not feces

C) Omphalocele

Midline abdominal wall defect

Covered by membrane

No fecal discharge

D) Ileal diverticulum

Associated with persistent vitellointestinal duct

Can form umbilical fistula

Fecal discharge

## QUESTION

The given image shows a congenital anomaly involving the anterior abdominal wall. What is the most likely diagnosis?



A Umbilical hernia

B Gastroschisis

C Bladder exstrophy

CORRECT

D Omphalocele

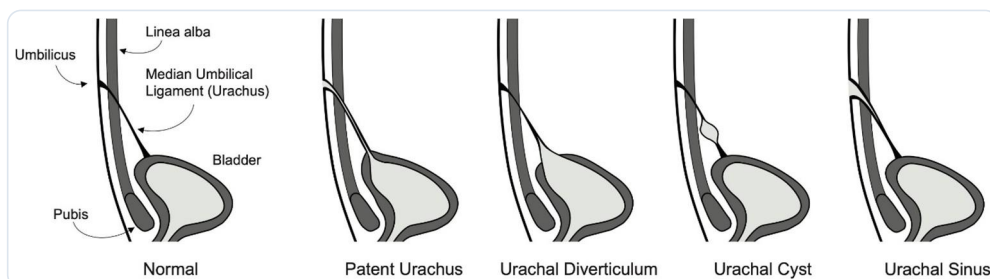
## RIGHT ANSWER

OK C. Bladder exstrophy

## WHY THIS IS RIGHT

Bladder exstrophy results from failure of closure of the lower anterior abdominal wall, leading to exposed posterior bladder wall on the surface.

Unlike omphalocele and gastroschisis, there is no covering membrane containing bowel, and the defect is infra-umbilical. Umbilical hernia presents as a skin-covered bulge at the umbilicus and does not expose visceral organs.



## QUESTION

Following fertilization, on which day does implantation of the embryo into the uterine endometrium begin?

A Day 15

B Day 8

C Day 2

D Day 6

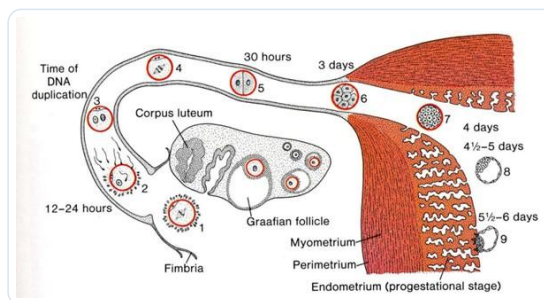
CORRECT

## RIGHT ANSWER

OK D. Day 6

## WHY THIS IS RIGHT

After fertilization, the zygote undergoes cleavage to form a blastocyst by day 4-5, which reaches the uterine cavity. Implantation begins around day 6 with attachment of the blastocyst to the endometrium. Earlier days correspond to cleavage stages, while day 15 is well beyond the implantation window.





## QUESTION

## | The oocyte phase in post-ovulation is:

- A** Primary oocyte arrested in prophase - I
- B** Secondary oocyte completed in prophase - II
- C** Primary oocyte arrested in prophase - II
- D** Secondary oocyte arrested in metaphase - II

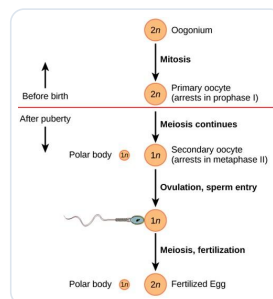
CORRECT

## RIGHT ANSWER

- OK** **D. Secondary oocyte arrested in metaphase - II**

## WHY THIS IS RIGHT

After ovulation, the oocyte is a secondary oocyte that has completed meiosis I and entered meiosis II. It remains arrested in metaphase II until fertilization occurs. Primary oocyte arrest in prophase I occurs prenatally, not post-ovulation.



## QUESTION

Which of the following statements is wrong about the clinical paediatric case as shown in the image?



**A** It occurs due to the persistence of prochordal plate

CORRECT

**B** It occurs due to the defective migration of primordial cells to the genital ridge

**C** It contains skin, cartilage and bone

**D** It is a benign tumor of coccyx

## RIGHT ANSWER

OK

**A. It occurs due to the persistence of prochordal plate**

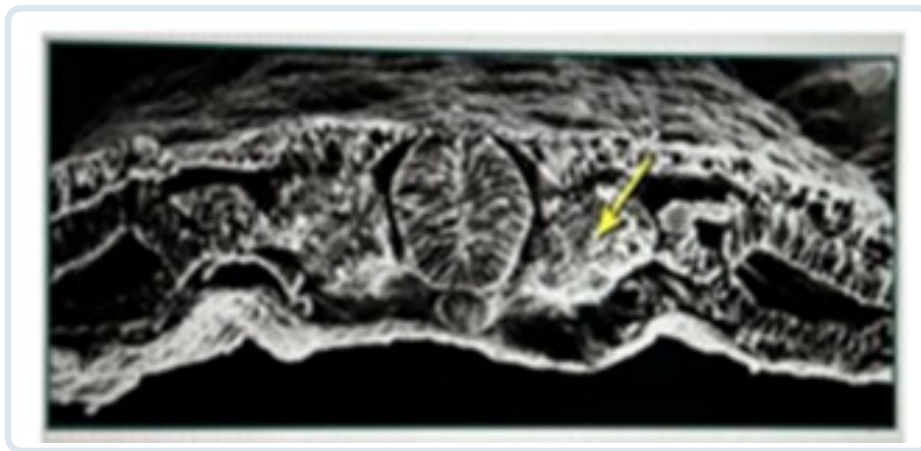
## WHY THIS IS RIGHT

The image represents a sacrococcygeal teratoma, which arises from defective migration of primordial germ cells to the genital ridge, not from persistence of the prochordal plate.

These tumors commonly contain tissues from all three germ layers such as skin, cartilage, and bone, and are typically benign tumors arising from the coccyx in neonates.

## QUESTION

Given below is the image of a 33-hour chick embryo. Which of the following is derived from the marked structure?



- A Kidney
- B Dorsal root ganglion
- C Ribs
- D Parietal pleura

CORRECT

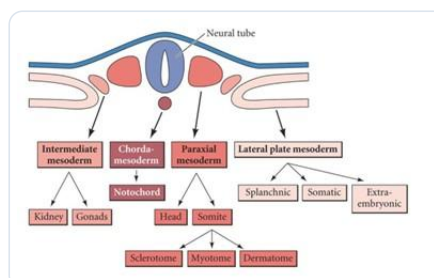
## RIGHT ANSWER

OK  
C. Ribs

## WHY THIS IS RIGHT

The correct answer is Ribs.

The marked structure in the 33-hour chick embryo represents the somite, specifically its sclerotome component. Sclerotome gives rise to vertebrae and ribs, while dermatome forms dermis and myotome forms skeletal muscle. Kidney (intermediate mesoderm), dorsal root ganglion (neural crest), and parietal pleura (lateral plate mesoderm) are derived from different embryological tissues.



## QUESTION

| The primary oocyte is arrested in which of the following stages?

A Pachytene

B Prophase

CORRECT

C Leptotene

D Metaphase

## RIGHT ANSWER

OK B. Prophase

## WHY THIS IS RIGHT

Primary oocytes arrest in prophase I (diplotene stage) from fetal life until puberty. Secondary oocyte arrests later in metaphase II until fertilization.

## QUESTION

**| Mitochondria of spermatozoa form which of the following parts?**

- A** Head sheath
- B** Connecting part
- C** **Middle piece**
- D** Tail

CORRECT

## RIGHT ANSWER

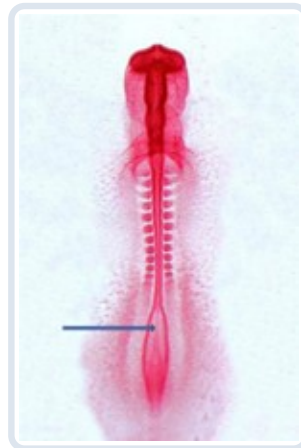
- OK** **C. Middle piece**

## WHY THIS IS RIGHT

Mitochondria are helical in the middle piece, supplying ATP for motility. The head contains nucleus/acrosome; tail contains axoneme; connecting piece is transitional.

## QUESTION

Identify the marked structure in the given image?



CORRECT

**A** Notochord

**B** Primitive streak

**C** Neural groove

**D** Neural crest cells

RIGHT ANSWER

**OK** A. Notochord

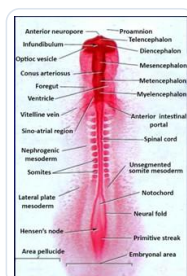
## WHY THIS IS RIGHT

The correct answer is Notochord.

The marked midline structure is the notochord, a rod-like axial mesodermal structure extending cranio-caudally beneath the neural tube.

It plays a key role in neural induction and later contributes to the nucleus pulposus of intervertebral discs.

Primitive streak is caudal and transient, neural groove is dorsal ectodermal, and neural crest cells migrate laterally rather than forming a midline rod.



## QUESTION

| Epiblast first migration lead to formation of?

A Ectoderm

B Endoderm

CORRECT

C Mesoderm

D Notochord

## RIGHT ANSWER

OK B. Endoderm

## WHY THIS IS RIGHT

The correct answer is Endoderm.

During gastrulation, the first wave of epiblast cell migration displaces the hypoblast to form the definitive endoderm.

The second wave forms intraembryonic mesoderm, while cells remaining in epiblast become ectoderm.

The notochord is derived later from axial mesoderm, not the initial migration.

## QUESTION

## | Primary follicles arrest in which phase of prophase 1?

A Leptotene

B Zygotene

C Pachytene

D Diplotene

CORRECT

## RIGHT ANSWER

OK

D. Diplotene

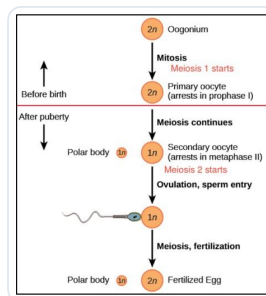
## WHY THIS IS RIGHT

The correct answer is Diplotene.

Primary oocytes remain arrested in the diplotene (dictyate) stage of prophase I from fetal life until puberty.

This arrest is maintained by oocyte maturation inhibitor (OMI) and meiosis resumes only at ovulation.

Leptotene, zygotene, and pachytene are earlier phases of prophase I that do not show physiological arrest.





## QUESTION

| Which of the following is NCC derivative for cardiac Structure?

A AV Cushion

B Septum primum

C SA node

D Conotruncal Septum

CORRECT

## RIGHT ANSWER

OK D. Conotruncal Septum

## WHY THIS IS RIGHT

The correct answer is Conotruncal septum.

Neural crest cells migrate into the cardiac outflow tract to form the aorticopulmonary (conotruncal) septum.

AV cushion, septum primum, and SA node are derived from endocardial mesenchyme or cardiogenic mesoderm, not neural crest.

## QUESTION

| All of the following are derivatives of NCC except:

**A** Retinal pigment membrane

CORRECT

**B** Ciliary muscles

**C** Melanocytes

**D** Ciliary ganglion

## RIGHT ANSWER

OK

**A. Retinal pigment membrane**

## WHY THIS IS RIGHT

The correct answer is Retinal pigment membrane.

The retinal pigment epithelium is derived from neuroectoderm (optic cup), not neural crest cells.

Neural crest derivatives include ciliary muscle, melanocytes, and ciliary ganglion, making options B, C, and D incorrect.

## QUESTION

A 3-month-old infant is scheduled for cleft lip repair. During the surgical procedure, which of the following muscles is primarily corrected?

A Levator labii superioris

B Orbicularis oris

CORRECT

C Orbicularis oculi

D Masseter

## RIGHT ANSWER

OK B. Orbicularis oris

## WHY THIS IS RIGHT

Cleft lip results from failure of fusion of the maxillary prominence with the medial nasal prominence, disrupting the orbicularis oris muscle.

Orbicularis oris forms the sphincter of the mouth and is essential for lip seal and feeding.



## QUESTION

Which of the following are correctly matched?

1. First arch - Maxillary artery
2. Second arch - Hyoid or stapedial artery
3. Third arch - Common carotid artery and distal internal carotid artery
4. Sixth arch - Arch of the aorta
5. Fourth arch - Right proximal subclavian artery

**A** 1, 2, and 5

CORRECT

**B** 1, 2, and 3

**C** 1, 2, 3, and 5

**D** 1, 3, 4, and 5

RIGHT ANSWER

**OK** A. 1, 2, and 5

## WHY THIS IS RIGHT

First arch forms the maxillary artery, second arch gives hyoid and stapedial arteries, and the right fourth arch forms the proximal right subclavian artery.

The third arch forms the common carotid and proximal internal carotid artery (not distal), while the sixth arch forms pulmonary arteries and ductus arteriosus, not the aortic arch.

## QUESTION

A 40-year-old patient accidentally swallowed a fish bone and presented with choking. On examination, the bone was found to be impacted in the esophagus at the level of T4 vertebra. Which of the following structures is responsible for the obstruction at this level?

A Cricopharyngeal junction

B Left bronchus

C Arch of aorta

CORRECT

D Diaphragm

## RIGHT ANSWER

OK

C. Arch of aorta

## WHY THIS IS RIGHT

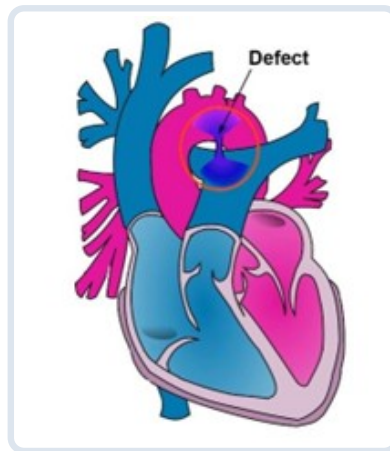
The esophagus has physiological constrictions, one of which occurs at the T4 vertebral level due to the arch of aorta crossing anterior to the esophagus.

This site is a common location for foreign body impaction, especially fish bones.

The cricopharyngeal junction lies at C6, the left bronchus crosses at T5-T6, and the diaphragm constriction is at T10.

## QUESTION

A defect in which of the following aortic arches causes the defect shown in the image?



A 4th left

B 4th right

C 6th left

CORRECT

D 6th right

RIGHT ANSWER

OK C. 6th left

## WHY THIS IS RIGHT

The ductus arteriosus is derived from the left 6th pharyngeal arch artery, and its persistence results in patent ductus arteriosus (PDA).

The 4th arch contributes to the aortic arch and subclavian artery, while the right 6th arch regresses, so defects there do not produce PDA.

## QUESTION

| Common site for congenital diaphragmatic hernia is:

A Anterolateral

B Central tendon

C Crural

D Posterolateral

CORRECT

## RIGHT ANSWER

OK D. Posterolateral

## WHY THIS IS RIGHT

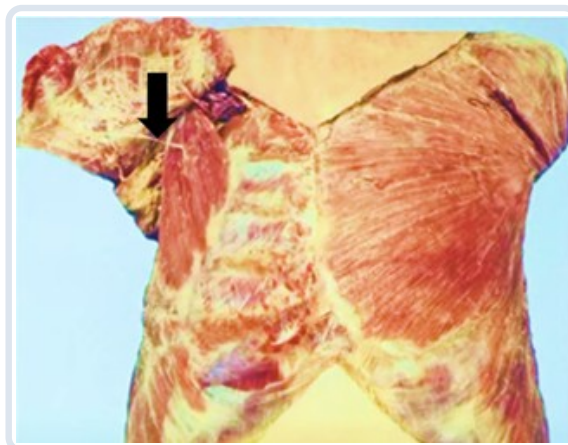
Congenital diaphragmatic hernia most commonly occurs through the foramen of Bochdalek, a posterolateral defect of the diaphragm.

It results from failure of closure of the pleuroperitoneal membrane, leading to herniation of abdominal contents into the thoracic cavity.

Anterior defects (foramen of Morgagni) are less common and usually right-sided.

## QUESTION

Identify the marked nerve.



A Thoracodorsal nerve

B Lateral pectoral nerve

C **Medial pectoral nerve**

CORRECT

D Long thoracic nerve

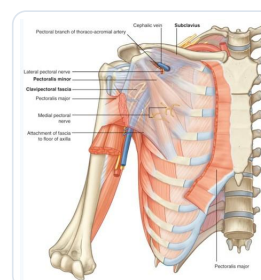
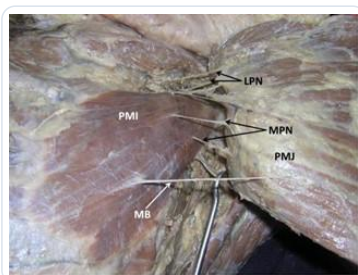
## RIGHT ANSWER

OK C. Medial pectoral nerve

## WHY THIS IS RIGHT

The marked nerve pierces and supplies the pectoralis minor and then continues to supply the pectoralis major, a classic identifying feature of the medial pectoral nerve.

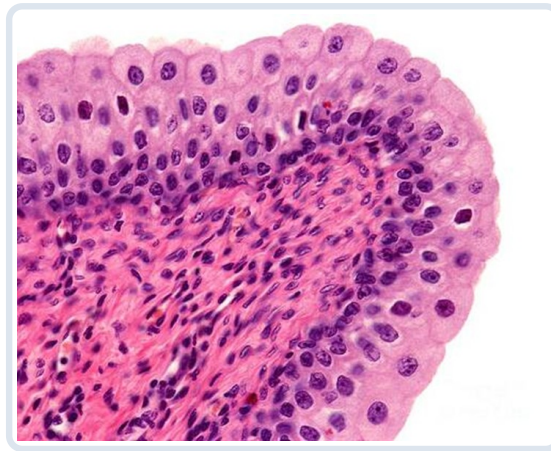
The lateral pectoral nerve supplies pectoralis major without piercing muscle, thoracodorsal nerve supplies latissimus dorsi, and long thoracic nerve supplies serratus anterior and runs on the chest wall.





## QUESTION

The epithelium shown in the image is typically found in which of the following locations in the human body?



CORRECT

**A** Ureter**B** Gallbladder**C** Intestine**D** Trachea

RIGHT ANSWER

OK

**A. Ureter**

## WHY THIS IS RIGHT

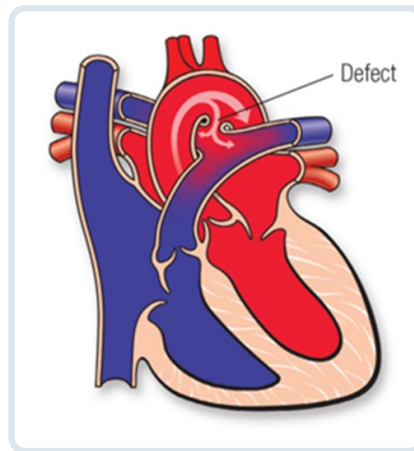
it lines parts of the urinary tract: Renal pelvis, Ureter, Urinary bladder, Proximal urethra

The image shows transitional epithelium (urothelium) with characteristic features:

1. Multiple layers (stratified epithelium)
2. Umbrella cells at surface - large dome-shaped cells
3. Internalization of cell membrane (clear spaces in umbrella cells)
4. Changes appearance when stretched

## QUESTION

Which aortic arch artery abnormality is responsible for producing the defect shown in the image?



A Right 4th pharyngeal arch artery

B Left 4th pharyngeal arch artery

C Right 6th pharyngeal arch artery

D Left 6th pharyngeal arch artery

CORRECT

## RIGHT ANSWER

OK

D. Left 6th pharyngeal arch artery

## WHY THIS IS RIGHT

The ductus arteriosus is derived from the left 6th aortic arch, and its persistence after birth results in patent ductus arteriosus (PDA).

The right 6th arch largely regresses, while the 4th arch arteries contribute to the aortic arch and subclavian artery, not PDA.

## QUESTION

Which of the following is a tributary of the inferior vena cava?

CORRECT

A Left inferior phrenic vein

B Left supra-renal vein

C Left gonadal vein

D Right ascending lumbar vein

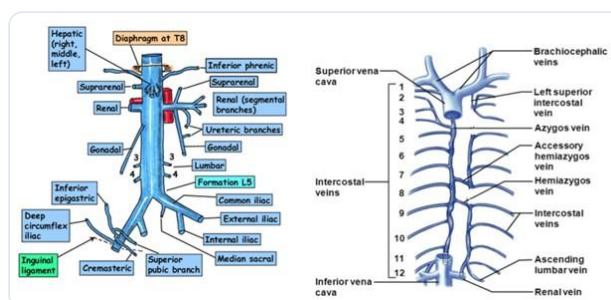
## RIGHT ANSWER

OK

A. Left inferior phrenic vein

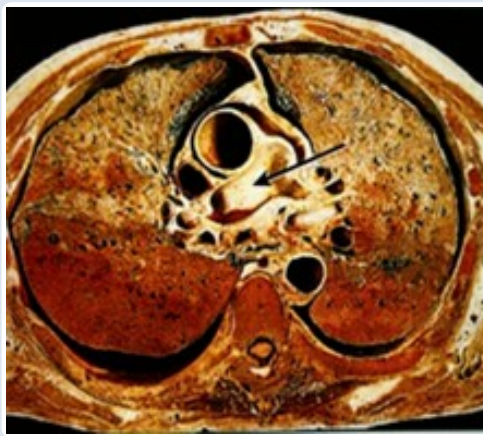
## WHY THIS IS RIGHT

The inferior vena cava (IVC) directly receives the inferior phrenic veins, including the left one. In contrast, the left suprarenal and left gonadal veins drain into the left renal vein, not directly into the IVC. The ascending lumbar veins contribute to the azygos system, not the IVC.



## QUESTION

Identify the structure marked with an arrow:



- A Carina
- B Superior vena cava
- C Pulmonary trunk**
- D Arch of Aorta

CORRECT

## RIGHT ANSWER

OK

**C. Pulmonary trunk**

## WHY THIS IS RIGHT

The pulmonary trunk lies anterior and left to the ascending aorta and arises from the right ventricle, making it identifiable in thoracic cross-sections.

The arch of aorta is more posterior and leftward, SVC lies on the right side of mediastinum, and carina is an airway bifurcation, not a vascular structure.

## QUESTION

In given image, nucleus of marked nerve is related to which of the following?



- A Midbrain
- B Pons
- C Medulla
- D Cervical spinal segment**

CORRECT

## RIGHT ANSWER

- OK** D. Cervical spinal segment

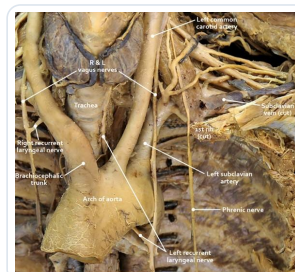
## WHY THIS IS RIGHT

The correct answer is Cervical spinal segment.

The marked nerve is the phrenic nerve, whose motor nucleus lies in the ventral horn of cervical spinal cord segments C3-C5.

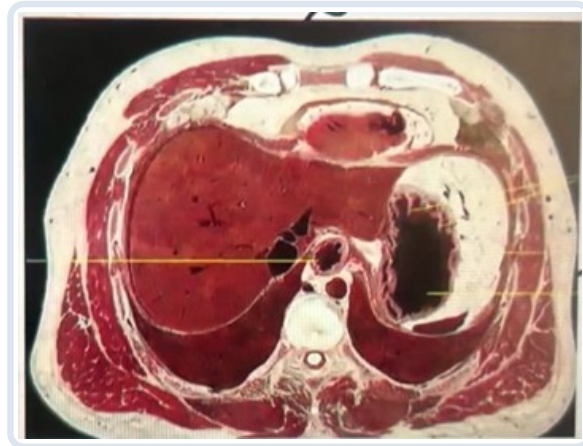
It provides the sole motor supply to the diaphragm, with the mnemonic "C3, 4, 5 keep the diaphragm alive."

Midbrain, pons, and medulla contain cranial nerve nuclei, not the origin of the phrenic nerve.



## QUESTION

Identify the vertebral level of section in given image.



A T9

CORRECT

B T10

C T11

D T12

RIGHT ANSWER

OK

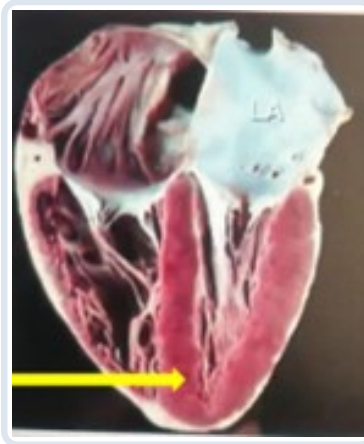
A. T9

## WHY THIS IS RIGHT

The T9 vertebral level in cross-sectional anatomy images often shows the liver, stomach, heart, and lungs, making it a key point for identifying these structures.

## QUESTION

| Artery supplying near marked structure is?



- A** Left circumflex artery
- B** Left marginal artery
- C** Anterior interventricular artery
- D** Posterior interventricular artery

CORRECT

## RIGHT ANSWER

OK

**C. Anterior interventricular artery**

## WHY THIS IS RIGHT

The correct answer is Anterior interventricular artery (LAD).

The LAD, a branch of the left coronary artery, runs in the anterior interventricular groove and supplies the anterior wall of left ventricle and anterior 2/3 of interventricular septum.

The left circumflex artery supplies the lateral/posterior left ventricle, the left marginal artery supplies the obtuse margin, and the posterior interventricular artery supplies the posterior septum and inferior wall.

## QUESTION

| Choose the true statement regarding breast.

- A** Superior & medial quadrant has more tissue
- B** 10 lobules are present
- C** Axillary tail of Spence crosses anterior axillary fold CORRECT
- D** Nipple is located at 4th intercostal space in most of the females

## RIGHT ANSWER

- OK** **C. Axillary tail of Spence crosses anterior axillary fold**

## WHY THIS IS RIGHT

The correct answer is Axillary tail of Spence crosses the anterior axillary fold.

The axillary tail is a superolateral extension of breast tissue that passes into the axilla across the anterior axillary fold, making it clinically important in breast examination and surgery. The axillary tail is an extension of upper outer quadrant, it passes through the foramen of Langer, enters the axilla and lies along the lateral border of pectoralis major.

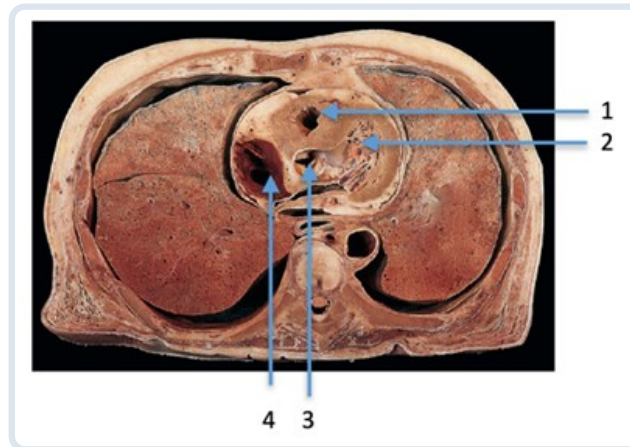
The superolateral quadrant (not superomedial) has maximum breast tissue, breasts have 15-20 lobules, and the nipple is usually at the 4th intercostal space in males, not consistently in females.



## QUESTION

In the labelled transverse section of the thorax at the level of the heart shown below, match each numbered structure (1-4) with the appropriate anatomical or clinical description:

1. Undergoes hypertrophy on pulmonary stenosis
2. Receives oxygenated blood
3. Arises from left ventricle
4. Lies to the right of ascending aorta



**A** 1-Undergoes hypertrophy on pulmonary stenosis, 2-Receives oxygenated blood, 3-Arises from left ventricle, 4- Lies to the right of ascending aorta **CORRECT**

**B** 1-Receives oxygenated blood, 2- Undergoes hypertrophy on pulmonary stenosis, 3-Arises from left ventricle, 4- Lies to the right of ascending aorta

**C** 1-Receives oxygenated blood, 2- Undergoes hypertrophy on pulmonary stenosis, 3- Lies to the right of ascending aorta, 4-Arises from left ventricle

**D** 1-Receives oxygenated blood, 2- Arises from left ventricle, 3- Lies to the right of ascending aorta, 4- Undergoes hypertrophy on pulmonary stenosis

## RIGHT ANSWER

**OK** **A. 1-Undergoes hypertrophy on pulmonary stenosis, 2-Receives oxygenated blood, 3-Arises from left ventricle, 4- Lies to the right of ascending aorta**

## WHY THIS IS RIGHT

Structure 1 is the right ventricle, which undergoes hypertrophy in pulmonary stenosis.  
Structure 2 corresponds to the left atrium, which receives oxygenated blood from pulmonary veins, while 3 is the ascending aorta arising from the left ventricle.  
Structure 4 is the pulmonary trunk, which lies to the right of the ascending aorta in transverse section.

## QUESTION

During an anaesthesia procedure, neuromuscular monitoring was performed as shown in the image to assess recovery from a muscle relaxant. In this procedure, which of the following nerves is being tested?



A Median nerve

B Radial nerve

C Ulnar nerve

CORRECT

D Axillary nerve

RIGHT ANSWER

OK

C. Ulnar nerve

## WHY THIS IS RIGHT

Neuromuscular monitoring during anaesthesia commonly stimulates the ulnar nerve at the wrist, assessing contraction of the adductor pollicis muscle.

This is preferred because adductor pollicis has a reliable and consistent response to neuromuscular blockade and recovery.

Median, radial, and axillary nerves are not routinely used for standard intraoperative neuromuscular monitoring.

## QUESTION

A patient presents to the OPD with a spiral fracture of the shaft of the humerus. The X-ray findings are shown in the image. Which of the following nerves is most commonly injured in this condition?



A Median nerve

B Radial nerve

CORRECT

C Ulnar nerve

D Axillary nerve

RIGHT ANSWER

OK

B. Radial nerve

## WHY THIS IS RIGHT

In a spiral fracture of the shaft of the humerus, the radial nerve is most commonly injured because it runs in the radial (spiral) groove on the posterior surface of the humeral shaft.

Injury leads to wrist drop due to paralysis of wrist and finger extensors, along with sensory loss over the dorsum of the hand.

## QUESTION

| Which of the following root values are most commonly affected in this condition?



A C5, C6

CORRECT

B C6, C7

C C7, C8

D C8, T1

RIGHT ANSWER

OK A. C5, C6

## WHY THIS IS RIGHT

This question refers to Erb's palsy, the most common type of brachial plexus injury, typically occurring due to excessive separation of the head and shoulder.

Because the injury occurs at C5-C6 roots, several nerves deriving from these roots are affected:

- Suprascapular nerve -> supraspinatus, infraspinatus
- Axillary nerve -> deltoid, teres minor
- Musculocutaneous nerve -> biceps brachii, brachialis
- Part of radial nerve (brachioradialis)

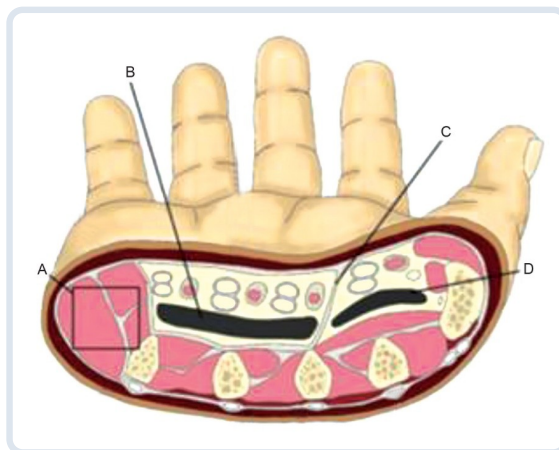
### Resulting deformity - "Waiter's tip posture"

Characteristic limb position:

- Arm adducted
- Medially rotated
- Elbow extended
- Forearm pronated

## QUESTION

A diabetic patient sustains a stab injury in the central area of the palm. After a few days, he develops swelling, pain, and inability to extend the middle and ring fingers. Pus accumulation is suspected in one of the palmar spaces. Which of the following spaces is most commonly involved?



A A

B B

CORRECT

C C

D D

RIGHT ANSWER

OK

B. B

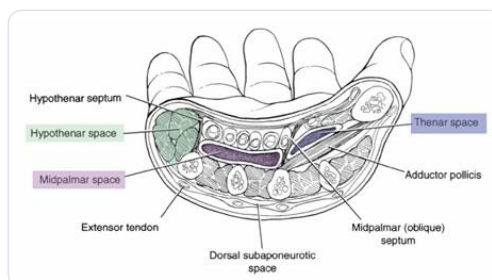
## WHY THIS IS RIGHT

The correct answer is Mid palmar space.

A stab injury in the central palm commonly leads to infection of the mid palmar space, which lies deep to the flexor tendons of the middle and ring fingers.

Pus in this space causes painful swelling and inability to extend the middle and ring fingers due to involvement of lumbricals and flexor tendon sheaths.

Thenar space affects thumb and index finger movements, while other palmar spaces are less commonly involved in central palm injuries.



## QUESTION

An elderly woman reports difficulty in buttoning her shirt and increased clumsiness in performing daily activities. On examination, the clinician asked her to make an 'O' using her thumb and index finger, which she was unable to do. Which of the following muscles is involved?

A Palmar interossei

B Opponens pollicis

C Flexor pollicis longus

CORRECT

D Abductor pollicis brevis

## RIGHT ANSWER

OK

C. Flexor pollicis longus

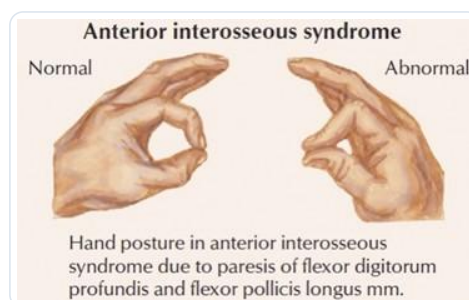
## WHY THIS IS RIGHT

Inability to make an "O" sign indicates weakness of flexion at the interphalangeal joint of the thumb, which is the primary action of flexor pollicis longus.

This muscle is supplied by the anterior interosseous nerve (median nerve branch), and its paralysis produces the classic positive pinch sign.

Opponens pollicis and abductor pollicis brevis mediate opposition and abduction, while palmar interossei act on digits, not the thumb IP joint.

\*



## QUESTION

A patient complains of decreased sensation in the lateral 3 ½ fingers of the palmar side of the right hand along with difficulty moving the upper phalanx of the thumb. Associated thenar atrophy is also present. What is the associated nerve injury in this case?

- A Ulnar nerve
- B Radial nerve
- C Anterior interosseous nerve
- D High median nerve

CORRECT

## RIGHT ANSWER

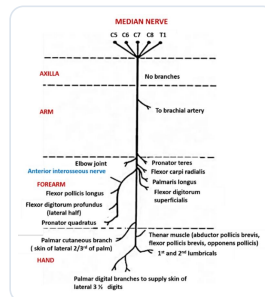
- OK
- D. High median nerve

## WHY THIS IS RIGHT

Sensory loss over the lateral 3½ fingers (palmar side) with thenar muscle atrophy indicates a proximal median nerve lesion.

Difficulty moving the upper phalanx of the thumb reflects weakness of thenar muscles (OP, APB, FPB) supplied by median nerve.

Ulnar and radial nerves have different sensory distributions, while anterior interosseous nerve is purely motor and spares sensation and thenar eminence.



## QUESTION

A patient presents with shoulder pain following a hyperextension injury during exercise. On examination, there is evidence of avulsion of the long head of the triceps. What is the site of avulsion of triceps?

- A Shaft of humerus
- B Supraglenoid tubercle
- C Infraglenoid tubercle**
- D Deltoid tuberosity of humerus

CORRECT

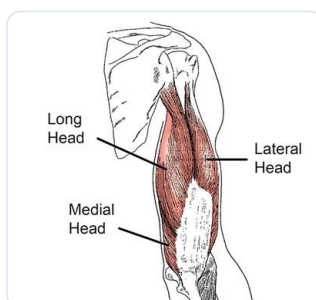
## RIGHT ANSWER

- OK
- C. Infraglenoid tubercle**

## WHY THIS IS RIGHT

The long head of triceps brachii originates from the infraglenoid tubercle of the scapula, crossing the shoulder joint. A hyperextension injury can avulse this tendon at its origin.

The shaft of humerus gives origin to the lateral and medial heads, supraglenoid tubercle is for the long head of biceps, and deltoid tuberosity is for deltoid insertion.





## QUESTION

Match the following muscles with their action at shoulder joint:

| Muscle                             | Action                            |
|------------------------------------|-----------------------------------|
| A. Latissimus dorsi                | 1. Flexion                        |
| B. Supraspinatus                   | 2. Extension with medial rotation |
| C. Infraspinatus                   | 3. Abduction                      |
| D. Pectoralis Major (sternal head) | 4. Lateral rotation               |

A A-4, B-3, C-2, D-1

B A-4, B-2, C-3, D-1

C A-2, B-1, C-4, D-3

D A-2, B-3, C-4, D-1

CORRECT

## RIGHT ANSWER

OK D. A-2, B-3, C-4, D-1

## WHY THIS IS RIGHT

Latissimus dorsi produces extension with medial rotation of the shoulder, while supraspinatus initiates abduction (first 15°).

Infraspinatus is a primary lateral rotator of the shoulder, and the sternal head of pectoralis major causes flexion and adduction of the humerus.

## QUESTION

## | Posterior interosseous nerve injury causes?

**A** Loss of extension at finger

CORRECT

**B** Loss of supination**C** Loss of extension of wrist**D** Wrist drop

## RIGHT ANSWER

OK

**A. Loss of extension at finger**

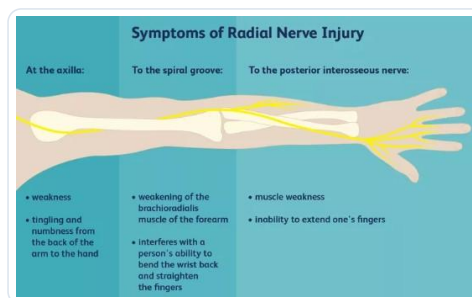
## WHY THIS IS RIGHT

The correct answer is loss of extension at fingers.

The posterior interosseous nerve (deep branch of radial nerve) supplies the finger and thumb extensors.

Wrist extension is largely preserved due to extensor carpi radialis longus and brevis, so wrist drop does not occur.

Supination is mainly by biceps brachii and supinator, which are not significantly affected.



## QUESTION

Which of the following muscles are supplied by the deep branch of the ulnar nerve?

1. 3rd lumbrical
2. 4th Dorsal interossei
3. Opponens digiti minimi
4. Flexor carpi ulnaris

A 1, 2, 3

CORRECT

B 2, 3, 4

C 1, 3, 4

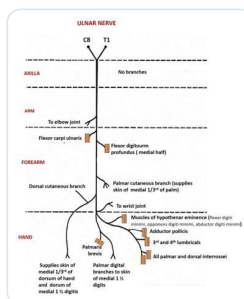
D 1, 2, 3, 4

## RIGHT ANSWER

OK A. 1, 2, 3

## WHY THIS IS RIGHT

The ulnar nerve divides into superficial and deep branches as it enters the hand. The deep branch of the ulnar nerve is responsible for supplying most of the intrinsic muscles of the hand.



## QUESTION

A patient presented to OPD with abdominal pain, jaundice, and portal hypertension. With the above symptoms identify the anastomosis seen in between veins.

CORRECT

**A** Esophageal veins and left gastric veins

**B** Left colic vein and middle colic veins

**C** Superior rectal and phrenic veins

**D** Sigmoid and superior rectal veins

## RIGHT ANSWER

**OK** A. Esophageal veins and left gastric veins

## WHY THIS IS RIGHT

In the given scenario of a patient with portal hypertension, anastomosis between esophageal veins and left gastric veins can be seen. In portal hypertension, increased pressure within the portal venous system may result in the dilation of portal venous tributaries and reversed flow at sites of portosystemic anastomoses.

## QUESTION

The fibres of the internal oblique muscle and transversus abdominus muscle contribute to which boundaries of the inguinal canal walls?

- i. Anterior wall
- ii. Roof
- iii. Floor
- iv. Posterior wall

**A** ii and iv.

CORRECT

**B** i, ii, and iv.

**C** i and iii.

**D** iii and iv.

RIGHT ANSWER

OK

**A. ii and iv.**

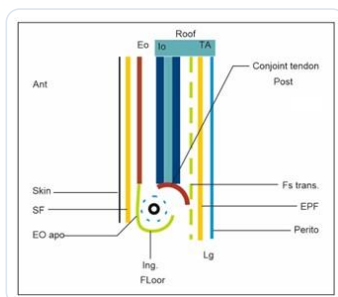
## WHY THIS IS RIGHT

The correct answer is ii and iv (Roof and posterior wall).

Fibers of internal oblique and transversus abdominis arch over the spermatic cord, forming the roof of the inguinal canal.

Their aponeurotic fusion forms the conjoint tendon, which reinforces the posterior wall medially.

Anterior wall is mainly external oblique aponeurosis, and the floor is formed by the inguinal ligament, not by these muscles.



## QUESTION

| Which of the following is false regarding the anatomy of the adrenal glands?

CORRECT

- A** The right adrenal gland is semi-lunar in shape
- B** The left adrenal gland is closely related with the tail of pancreas and spleen.
- C** The adrenal is yellow on gross appearance.
- D** The adrenal is retroperitoneal in location.

## RIGHT ANSWER

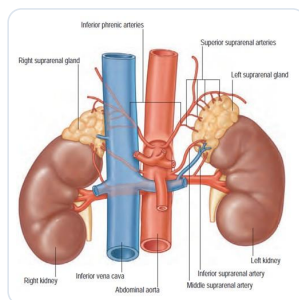
OK

**A. The right adrenal gland is semi-lunar in shape**

## WHY THIS IS RIGHT

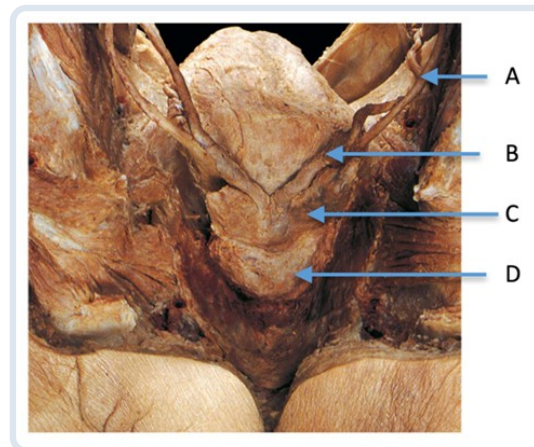
The right adrenal gland is pyramidal (triangular) in shape, while the left adrenal gland is semilunar, making option incorrect.

The left adrenal is related to the tail of pancreas and spleen, both adrenals are yellow due to lipid-rich cortex, and they are retroperitoneal, all of which are true statements.



## QUESTION

Match the following in the given image below:



**A** A-prostate, B-ureter, C-vas deferens, D-seminal vesicle

**B** A-vas deferens, B-ureter, C-prostate, D-seminal vesicle

**C** **A-ureter, B-vas deferens, C-seminal vesicle, D-prostate**

CORRECT

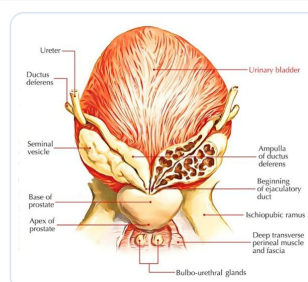
**D** A-vas deferens, B-ureter, C-prostate, D-seminal vesicle

## RIGHT ANSWER

**OK** C. A-ureter, B-vas deferens, C-seminal vesicle, D-prostate

## WHY THIS IS RIGHT

This cadaveric image shows the posterior surface of the urinary bladder with its related structures.



## QUESTION

| Which of the following is not the boundary of hepatocystic triangle?

A Common hepatic duct

B Inferior border of liver

C Cystic duct

D Cystic artery

CORRECT

## RIGHT ANSWER

OK

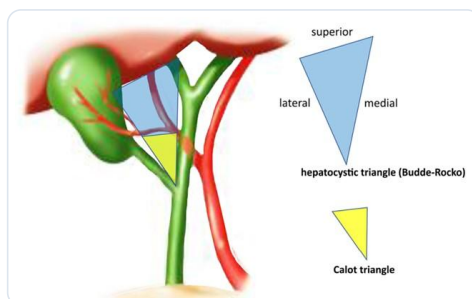
D. Cystic artery

## WHY THIS IS RIGHT

The hepatocystic triangle (also called hepatobiliary triangle) is an important surgical landmark used during cholecystectomy and other biliary procedures. The boundaries of the hepatocystic triangle are:

- Superior border (base): Inferior border of the liver
- Right border: Cystic duct
- Left border: Common hepatic duct

The cystic artery is not a boundary of the hepatocystic triangle but rather passes through it as content. The cystic artery typically runs within this triangular space and is an important structure that needs to be identified and ligated during cholecystectomy.





## QUESTION

Identify the vein that is most likely affected in the image shown.



**A** Great saphenous vein

CORRECT

**B** Short saphenous vein

**C** Femoral vein

**D** Perforator vein

## RIGHT ANSWER

OK

**A. Great saphenous vein**

## WHY THIS IS RIGHT

Varicosities most commonly involve the great saphenous vein due to valvular incompetence, especially at the saphenofemoral junction. It runs along the medial side of the leg and thigh, making it the vein most frequently affected in varicose vein disease.

## QUESTION

A patient presents with loss of sensation on the lateral aspect of the sole. Which of the following nerve roots is most likely affected?

A L4

B L5

C S1

CORRECT

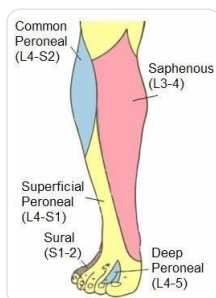
D S2

## RIGHT ANSWER

OK C. S1

## WHY THIS IS RIGHT

The lateral aspect of the sole corresponds to the S1 dermatome, supplied via branches of the tibial nerve. S1 root involvement is classically associated with sensory loss over the lateral foot and sole, often seen in L5-S1 disc pathology. L4 and L5 supply medial leg and dorsum of foot, while S2 mainly supplies the posterior thigh and perineal region.



## QUESTION

In the provided radiograph of the leg, identify the structure whose injury results in limited dorsiflexion of the foot.



A A

B B

C C

D D

CORRECT

RIGHT ANSWER

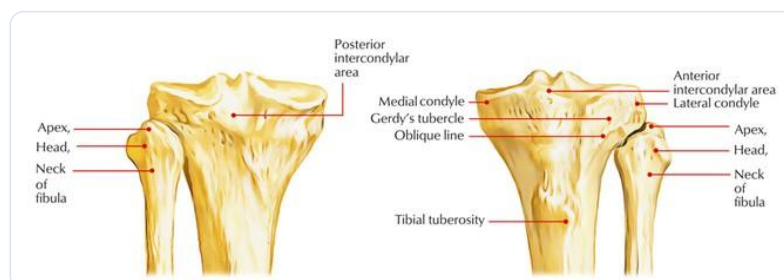
OK

D. D

## WHY THIS IS RIGHT

The marked structure corresponds to the neck of the fibula, where the common peroneal (fibular) nerve winds superficially.

Injury at this site affects the deep peroneal nerve, leading to paralysis of dorsiflexors and resulting in foot drop.



## QUESTION

A patient sustains an injury on the lateral aspect of the knee. After a few days, he develops difficulty in walking due to dragging of foot, along with numbness over the upper lateral side of the leg and dorsum of the foot. Which of the following nerves is most commonly injured in this case?

- A** Sciatic nerve
- B** Common peroneal nerve
- C** Deep peroneal nerve
- D** Superficial peroneal nerve

CORRECT

## RIGHT ANSWER

- OK** **B. Common peroneal nerve**

## WHY THIS IS RIGHT

The common peroneal nerve winds around the neck of the fibula on the lateral side of the knee, making it highly vulnerable to injury.

Damage causes foot drop due to loss of dorsiflexion (deep peroneal nerve) and sensory loss over the upper lateral leg and dorsum of the foot (superficial peroneal nerve).

## QUESTION

Examine the radiograph of the foot and identify the bone marked by the arrow.



A Lateral cuneiform

B Intermediate cuneiform

C **Navicular**

CORRECT

D Cuboid

## RIGHT ANSWER

OK C. Navicular

## WHY THIS IS RIGHT

The navicular is a boat-shaped tarsal bone located on the medial side of the foot, between the talus proximally and the three cuneiforms distally. It is a key component of the medial longitudinal arch and is prone to stress fractures, especially in athletes. Cuboid lies laterally, while cuneiforms are distal to the navicular and smaller in size.

## QUESTION

A patient underwent surgery for the varicose vein. He now complains of sensory loss over the medial aspect of the leg and foot. Which of the following nerves is most likely to be injured?

- A** Sural nerve
- B** Superficial peroneal nerve
- C** Deep peroneal nerve
- D** Saphenous nerve

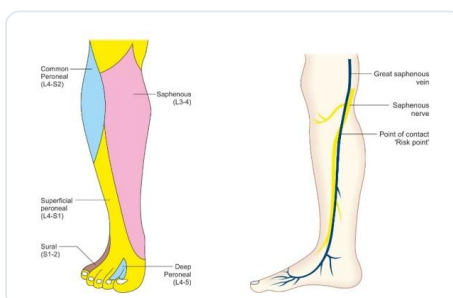
CORRECT

## RIGHT ANSWER

- OK** D. Saphenous nerve

## WHY THIS IS RIGHT

The saphenous nerve is a pure sensory branch of the femoral nerve supplying the medial aspect of the leg and foot. It runs alongside the great saphenous vein, making it vulnerable during varicose vein surgery. Sural nerve supplies the lateral foot, while superficial and deep peroneal nerves supply the dorsum of foot and first web space, respectively.



## QUESTION

Injury at which of the following marked sites causes failure of dorsiflexion?



A 3

CORRECT

B 2

C 1

D 4

RIGHT ANSWER

OK A. 3

## WHY THIS IS RIGHT

The marked site corresponds to the neck of the fibula, where the common fibular (peroneal) nerve winds superficially and is highly vulnerable to injury. Damage here affects the deep fibular nerve, leading to paralysis of dorsiflexors of the foot and resulting in foot drop.

## QUESTION

Which nerve supplies the hybrid muscle partially spared in a patient who presented with sciatica and tender hamstrings?

A Common peroneal nerve

B Femoral nerve

C Obturator nerve

CORRECT

D Tibial nerve

## RIGHT ANSWER

OK C. Obturator nerve

## WHY THIS IS RIGHT

The hybrid muscle referred to is the adductor magnus, which has a dual nerve supply-the hamstring (ischiocondylar) part by tibial nerve and the adductor part by obturator nerve.

In sciatica, tibial nerve fibers are affected, but the obturator nerve supply partially spares the muscle.

Thus, residual function of adductor magnus points to obturator nerve involvement.



## QUESTION

During examination of a patient with an intern, the professor asks the patient to invert his foot and he points at the prominent tendon behind the medial malleolus. Which is the tendon being pointed at here?

A Tibialis anterior

B Tibialis posterior

CORRECT

C Extensor digitorum

D Extensor hallucis longus

## RIGHT ANSWER

OK

**B. Tibialis posterior**

## WHY THIS IS RIGHT

The tibialis posterior tendon passes behind the medial malleolus and is the chief inverter of the foot. It also supports the medial longitudinal arch, making its tendon prominent during inversion. Tibialis anterior and extensor tendons lie anterior to the ankle joint, not behind the medial malleolus.

## QUESTION

Which artery is used for AV shunting with the great saphenous vein for hemodialysis and is present behind the medial malleolus and 2.5 cm in front of the tendon calcaneus?

A Peroneal artery

B Anterior tibial artery

C Dorsalis pedis artery

D Posterior tibial artery

CORRECT

## RIGHT ANSWER

OK

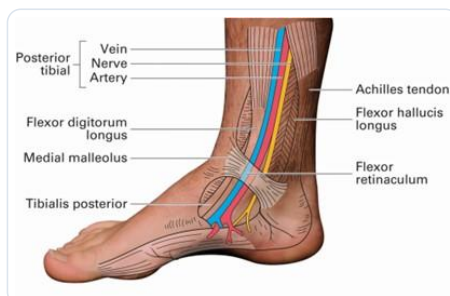
D. Posterior tibial artery

## WHY THIS IS RIGHT

The posterior tibial artery runs behind the medial malleolus, approximately 2.5 cm anterior to the tendon calcaneus, making it easily accessible.

It is commonly used for arteriovenous shunting with the great saphenous vein in haemodialysis.

Peroneal artery lies deep, anterior tibial continues as dorsalis pedis on the dorsum of foot, and dorsalis pedis is not located behind the medial malleolus.



## QUESTION

Which segment of the vertebrae is involved in a patient presenting with pain in the back of the thigh and the leg after lifting heavy weight?

A S2

B S1

CORRECT

C L5

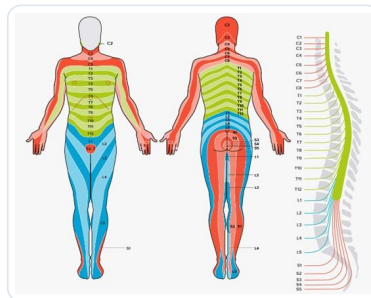
D L4

RIGHT ANSWER

OK B. S1

## WHY THIS IS RIGHT

Pain radiating along the back of the thigh and posterior leg corresponds to the S1 dermatome, classically seen in sciatica. S1 root involvement commonly occurs with L5-S1 disc herniation, affecting the Achilles reflex. L4 and L5 involve anterior/anterolateral leg regions, while S2 pain is more perineal/posterior thigh only.



## QUESTION

A patient presents with an ankle injury following excessive eversion of the foot. Which of the following ligaments is most commonly injured in this type of injury?

A Anterior talo-fibular ligament

B Posterior talo-fibular ligament

C Deltoid ligament

CORRECT

D Calcaneo-fibular ligament

## RIGHT ANSWER

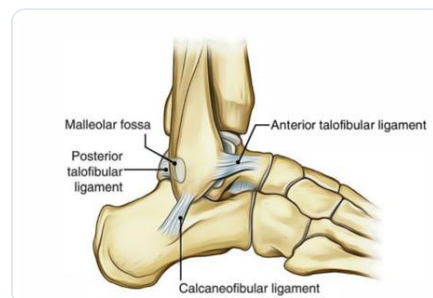
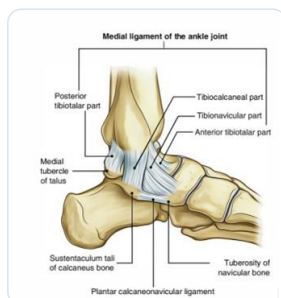
OK C. Deltoid ligament

## WHY THIS IS RIGHT

The correct answer is Deltoid ligament.

Excessive eversion stresses the medial collateral (deltoid) ligament, making it the ligament most commonly injured in eversion ankle trauma.

ATFL, PTFL, and calcaneofibular ligaments are lateral ligaments typically injured in inversion injuries, not eversion.



## QUESTION

A patient presents with pain along the lateral aspect of the thigh. What is the root value of this nerve?

A T12-L1

B L1-L2

C L2-L3

CORRECT

D L3-L4

## RIGHT ANSWER

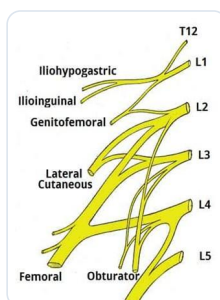
OK C. L2-L3

## WHY THIS IS RIGHT

Pain along the lateral aspect of the thigh with sensory symptoms indicates involvement of the lateral femoral cutaneous nerve.

This nerve arises from L2-L3 roots, passes under the inguinal ligament near ASIS, and is commonly compressed causing meralgia paresthetica.

It is a purely sensory nerve, with no motor deficit, helping distinguish it from femoral or obturator nerve lesions.



## QUESTION

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

Options:

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

A 2 and 5

CORRECT

B 3 and 4

C 1 and 3

D 2 and 4

## RIGHT ANSWER

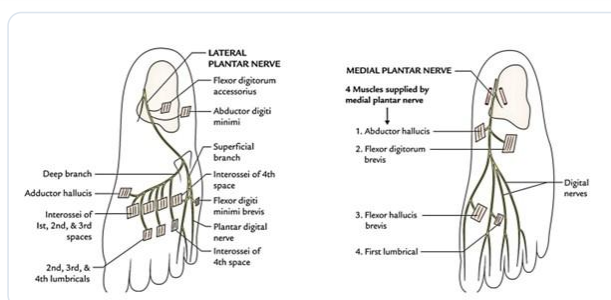
OK

A. 2 and 5

## WHY THIS IS RIGHT

The lateral plantar nerve supplies most intrinsic sole muscles, including flexor digitorum accessorius (quadratus plantae) and the interossei (via its deep branch).

Abductor hallucis and the first lumbrical are supplied by the medial plantar nerve, while flexor hallucis brevis has dual supply but its medial head is medial plantar-hence excluded here.



## QUESTION

When asked the patient to stand on left foot, right side went down. Which structures are involved in this case?

Options:

1. Superior gluteal nerve
2. Gluteus minimus
3. Gluteus medius
4. Sciatic nerve



A 1, 2, 3, 4

B 1, 2, 3

CORRECT

C 2, 3, 4

D 1, 3, 4

RIGHT ANSWER

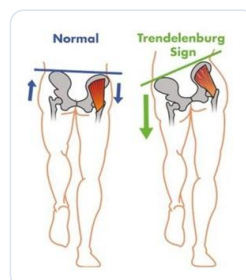
OK B. 1, 2, 3

## WHY THIS IS RIGHT

The finding describes a positive Trendelenburg sign, due to weakness of gluteus medius and minimus on the stance side. Both muscles are supplied by the superior gluteal nerve, which stabilizes the pelvis during single-leg stance.

The sciatic nerve is not involved in pelvic stabilization and does not contribute to this sign.

This question describes a clinical scenario where a patient is exhibiting a positive Trendelenburg sign. When asked to stand on the left foot, the patient's right-side drops, indicating a problem with the muscles or nerves responsible for maintaining hip stability. The Trendelenburg sign indicates weakness or paralysis of the muscles innervated by the superior gluteal nerve.



## QUESTION

| Which is the most common hernia in females?

- A** Direct inguinal hernia
- B** Indirect inguinal hernia
- C** Femoral hernia
- D** Obturator hernia

CORRECT

## RIGHT ANSWER

- OK** **B. Indirect inguinal hernia**

## WHY THIS IS RIGHT

In females, the most common type of hernia is the indirect inguinal hernia, despite femoral hernias being more common in females compared to males.

Incidence of Hernia in Females: Indirect inguinal Hernia > Direct inguinal Hernia > Femoral hernia

Most common hernia overall -> Indirect inguinal

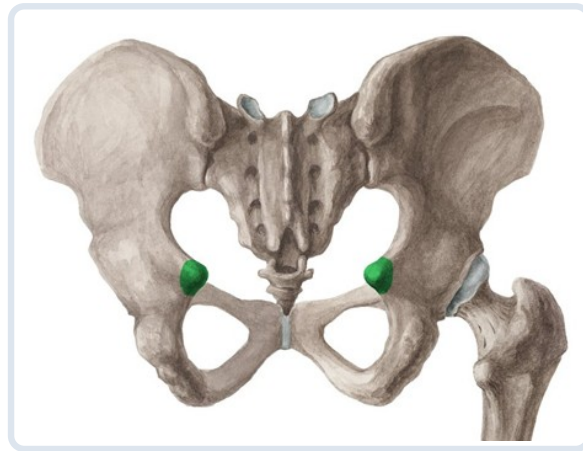
Most common hernia in females -> Indirect inguinal

Femoral hernia -> More common in females but not most common overall



## QUESTION

What is the vertebral level of the marked structure in the image in anatomical position?



A L4

B L4-L5

C S3-S5

D Coccyx

CORRECT

RIGHT ANSWER

OK

D. Coccyx

## WHY THIS IS RIGHT

The correct answer is Coccyx.

The ischial spine, when correlated in anatomical position, lies at the level of the coccyx.

It is a key pelvic landmark used in obstetrics and anaesthesia (pudendal nerve block).

Levels L4-L5 correspond to iliac crest, and S3-S5 relate to pelvic diaphragm, not the ischial spine.

## QUESTION

| While walking, the suspended leg is supported by which muscle on other side?

**A** Gluteus medius

CORRECT

**B** Gluteus maximus

**C** Tensor Fascia Lata

**D** Quadriceps femoris

## RIGHT ANSWER

OK

**A. Gluteus medius**

## WHY THIS IS RIGHT

The correct answer is Gluteus medius.

During walking, gluteus medius of the stance limb stabilizes the pelvis and prevents dropping of the pelvis on the suspended side.

Paralysis causes a positive Trendelenburg sign with pelvic tilt toward the unsupported limb.

Gluteus maximus extends the hip, tensor fascia lata assists abduction, and quadriceps stabilizes the knee, not pelvic support.

## QUESTION

Which of the following muscles are supplied by superficial peroneal nerve?

1. Peroneus brevis
2. Peroneus longus
3. Peroneus tertius
4. Extensor hallucis longus

A 1, 2, 3

B 1, 2

CORRECT

C 1, 2, 3, 4

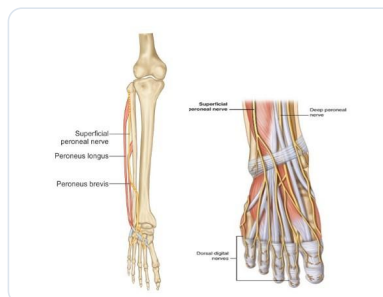
D 1, 3, 4

RIGHT ANSWER

OK B. 1, 2

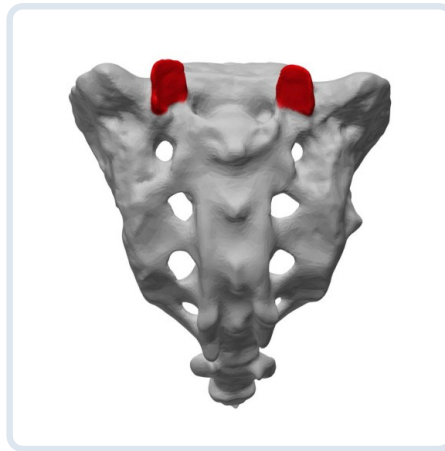
## WHY THIS IS RIGHT

The leg is divided into three compartments, each with its specific nerve supply. The lateral compartment of the leg contains only two muscles: peroneus longus and peroneus brevis. Both of these muscles are innervated by the superficial peroneal nerve.



## QUESTION

What is the primary action of the muscle attached to the area indicated by the arrow in the image given below?



- A Medial rotation of hip
- B External rotation of hip/ Abduction of hip**

CORRECT

- C Flexion at knee
- D Extension at knee

## RIGHT ANSWER

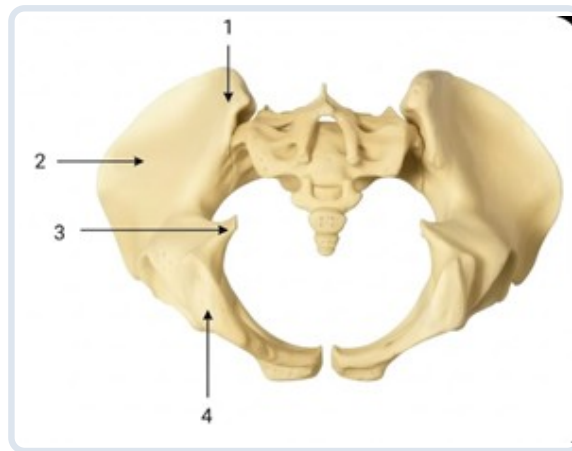
- B. External rotation of hip/ Abduction of hip**

## WHY THIS IS RIGHT

The arrow in the image points to the attachment site of the gluteus maximus muscle on the sacrum. The gluteus maximus is the largest and most superficial muscle of the gluteal region.

## QUESTION

Which of the following provides attachment to the muscle responsible for extension at the hip and at the knee?



A 1

CORRECT

B 2

C 3

D 4

RIGHT ANSWER

OK

A. 1

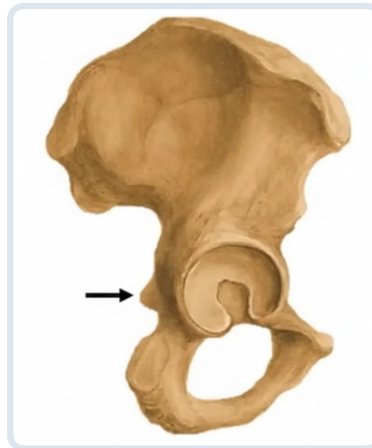
## WHY THIS IS RIGHT

The muscle responsible for extension at both the hip and the knee is the hamstring group. Hamstrings (semitendinosus, semimembranosus, long head of biceps femoris) originate from the ischial tuberosity, which is label 4 in the image.

From the labelled image: Label 2 corresponds to the iliac ala (gluteus medius attachment - hip abduction), label 1 relates to gluteus maximus (hip extension only), and label 3 marks the ischial spine (pelvic floor/pudendal landmark), none of which extend the knee.

## QUESTION

Which of the following is not related/attached to the structure marked in the image?



CORRECT

**A** Tendon of obturator externus

**B** Pudendal nerve

**C** Internal pudendal vessels

**D** Ischiococcygeus

RIGHT ANSWER

OK

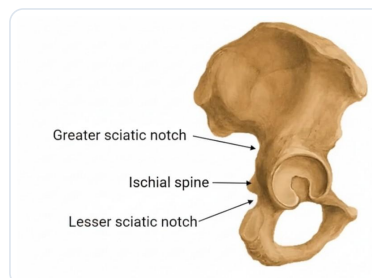
**A. Tendon of obturator externus**

## WHY THIS IS RIGHT

The marked structure is the ischial spine.

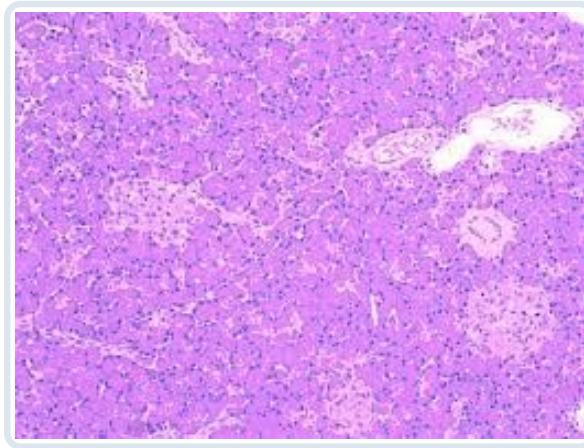
It gives attachment to ischiococcygeus and serves as a landmark where the pudendal nerve and internal pudendal vessels hook around from pelvis to perineum.

The tendon of obturator externus attaches to the trochanteric fossa of femur, not to the ischial spine, making it the incorrect option.



## QUESTION

Identify the given structure:



A Lymph node

B Glomerulus

C Spleen

D Pancreatic islet cells

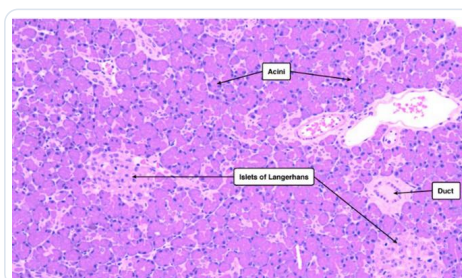
CORRECT

RIGHT ANSWER

OK D. Pancreatic islet cells

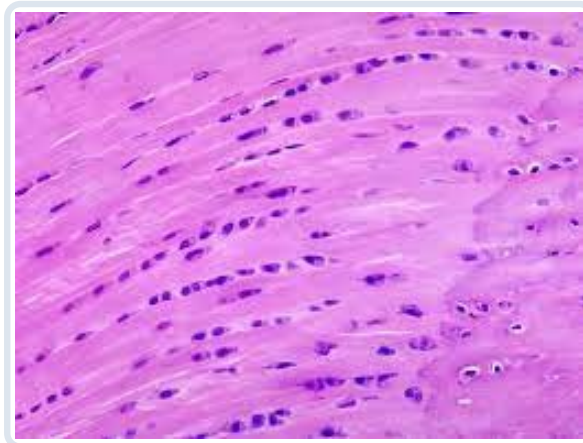
## WHY THIS IS RIGHT

Islets of Langerhans appear as pale-staining, rounded cell clusters scattered within darker exocrine pancreatic tissue. They contain endocrine cells secreting insulin, glucagon, and somatostatin. Lymph nodes show follicles, spleen shows white and red pulp, and glomerulus is a capillary tuft within Bowman's capsule.



## QUESTION

Identify the cartilage given below:



A Non articular hyaline cartilage

B Articular hyaline cartilage

C Yellow cartilage

D White fibrocartilage

CORRECT

## RIGHT ANSWER

OK

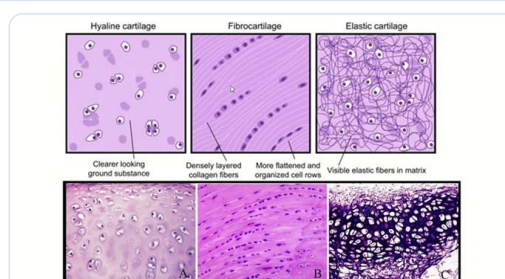
D. White fibrocartilage

## WHY THIS IS RIGHT

The given image shows prominent collagen fibers arranged in bundles with intervening rows of chondrocytes. This is suggestive of white fibrocartilage.

Microscopy of fibrocartilage shows the following:

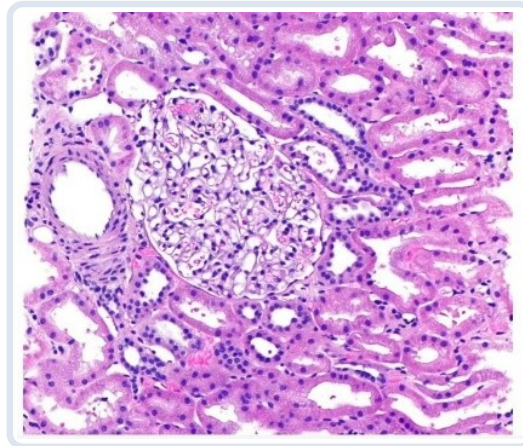
- Chondrocytes- Round in shape (in tendons they are flattened and elongated)
- Ground tissue with collagen fibers- Type I collagen fibers
- Absence of perichondrium





## QUESTION

Identify the structure in the following histological image



A Leydig cells of testis

B Pancreatic islet cells

C Hassall's corpuscles

D Glomerulus

CORRECT

RIGHT ANSWER

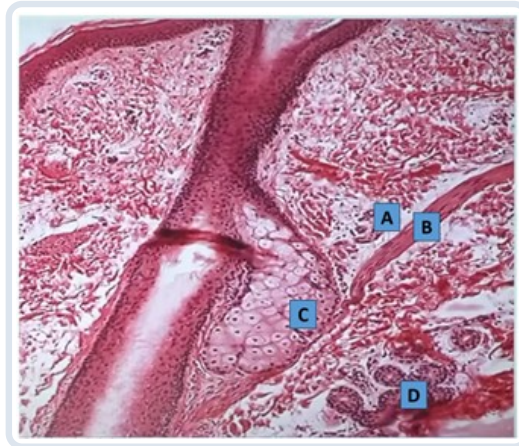
OK D. Glomerulus

## WHY THIS IS RIGHT

A glomerulus appears as a tuft of capillaries surrounded by Bowman's capsule, forming the renal corpuscle. Leydig cells are interstitial testicular cells, pancreatic islets are pale endocrine clusters, and Hassall's corpuscles are concentric epithelial whorls seen in the thymic medulla.

## QUESTION

Identify the structures in the given image.



- A** A - Apocrine sweat gland, B - Arrector pilorum, C - Eccrine sweat gland, D - Sebaceous gland
- B** A - Arrector pilorum, B - Apocrine sweat gland, C - Eccrine sweat gland, D - Sebaceous gland
- C** A - Sebaceous gland, B - Eccrine sweat gland, C - Arrector pilorum, D - Apocrine sweat gland
- D** A - Eccrine sweat gland, B - Arrector pilorum, C - Sebaceous gland, D - Apocrine sweat gland **CORRECT**

## RIGHT ANSWER

OK

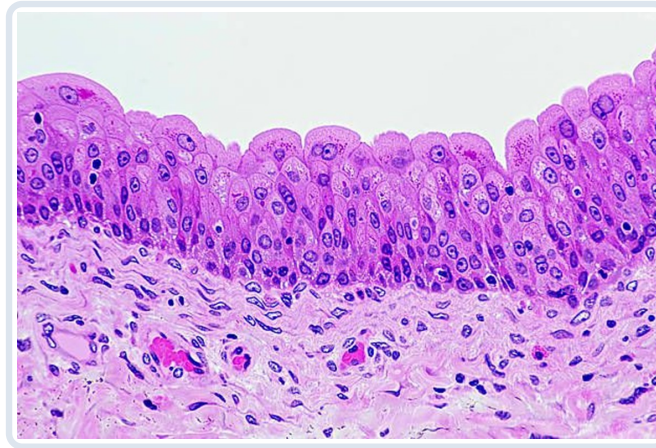
**D. A - Eccrine sweat gland, B - Arrector pilorum, C - Sebaceous gland, D - Apocrine sweat gland**

## WHY THIS IS RIGHT

Eccrine glands are small, coiled tubular glands opening directly onto the skin surface, while apocrine glands are larger, open into hair follicles, and are active after puberty. The sebaceous gland is a lobulated holocrine gland associated with hair follicles, and the arrector pilorum is smooth muscle attaching the follicle to the dermis, responsible for piloerection.

## QUESTION

| The shown epithelium is seen in:



A Duodenum

B Gall bladder

C Trachea

D Ureter

CORRECT

RIGHT ANSWER

OK

D. Ureter

## WHY THIS IS RIGHT

The ureter is lined by transitional epithelium (urothelium), which allows distension without loss of integrity. Duodenum and gall bladder have simple columnar epithelium, while trachea is lined by pseudostratified ciliated columnar epithelium.

## QUESTION

A chronic tobacco consumer went to the dental clinic with bleeding lesions on the tongue and was diagnosed with carcinoma of the tongue. Which of the papillae does not have taste buds?

A Circumvallate

B Filiform

CORRECT

C Foliate

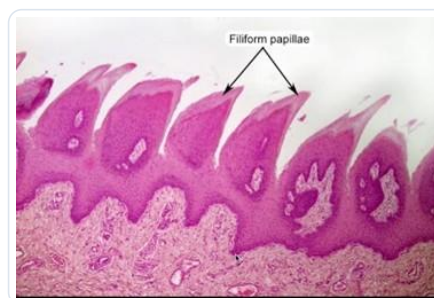
D Fungiform

## RIGHT ANSWER

OK B. Filiform

## WHY THIS IS RIGHT

Filiform papillae are most numerous and have a mechanical role, lacking taste buds and often keratinized. Circumvallate, foliate, and fungiform papillae contain taste buds and are involved in gustation, making them clinically relevant in tongue carcinomas affecting taste.



## QUESTION

| Longitudinal growth of the bone is affected from fracture at:

A Epiphysis

B Metaphysis

C Diaphysis

D Epiphyseal plate

CORRECT

## RIGHT ANSWER

OK D. Epiphyseal plate

## WHY THIS IS RIGHT

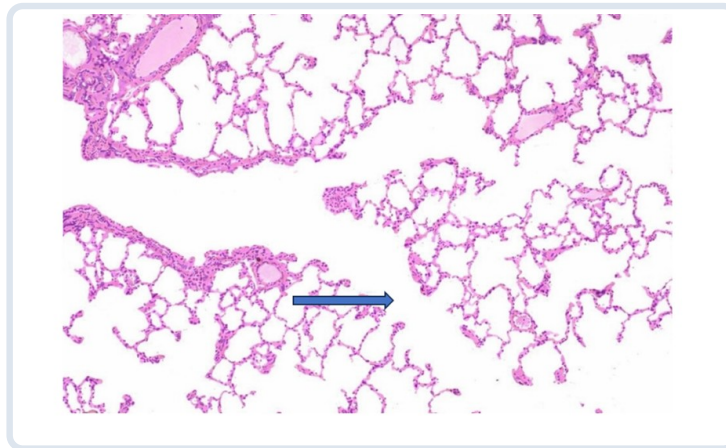
Longitudinal growth of long bones occurs at the epiphyseal (growth) plate, where cartilage proliferation and ossification take place.

Fracture or damage to this plate in growing children can cause growth arrest or limb length discrepancy.

Epiphysis, metaphysis, and diaphysis do not directly mediate longitudinal growth.

## QUESTION

Identify the structure indicated by the arrow:



- A Alveolar sac
- B Respiratory bronchus**
- C Terminal bronchiole
- D Intrapulmonary bronchiole

CORRECT

## RIGHT ANSWER

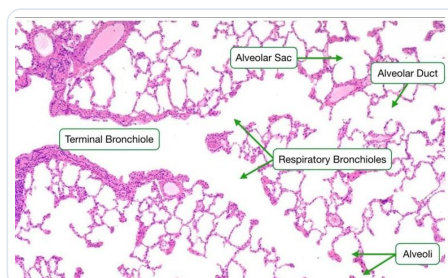
OK

**B. Respiratory bronchus**

## WHY THIS IS RIGHT

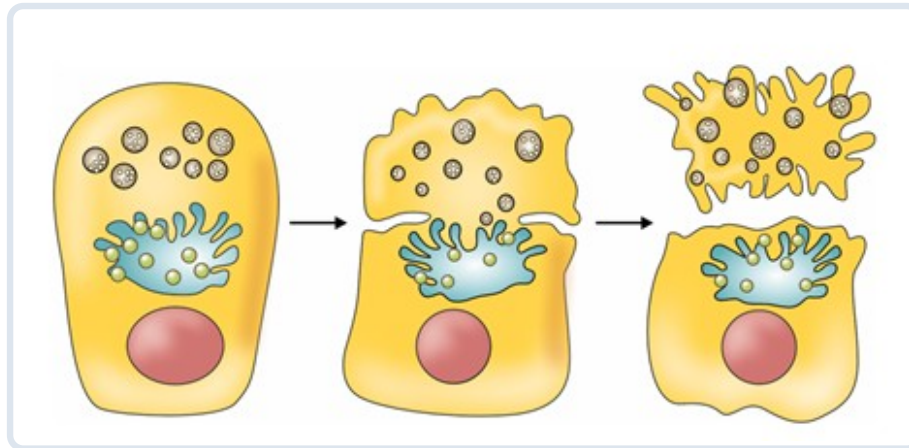
A respiratory bronchiole is identified by alveoli budding from its walls, marking the beginning of the respiratory zone where gas exchange occurs.

Terminal and intrapulmonary bronchioles lack alveoli and are purely conducting airways, while an alveolar sac is composed entirely of alveoli without a bronchiolar wall.



## QUESTION

Apocrine glands are present in which of the following?



- A Face
- B Scalp
- C Palms and soles
- D Axilla

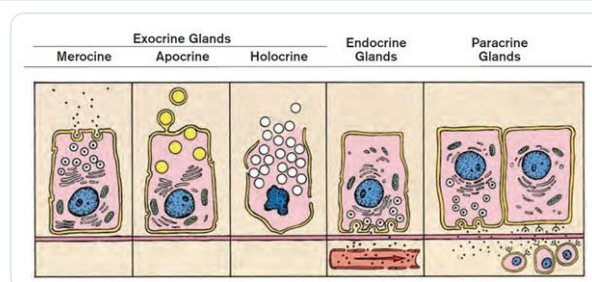
CORRECT

## RIGHT ANSWER

OK D. Axilla

## WHY THIS IS RIGHT

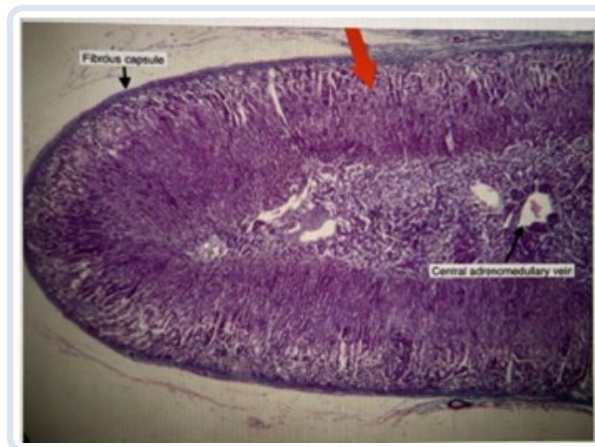
Apocrine glands are located in axilla, areola, perineum, and external auditory canal and become functional at puberty, secreting a viscous, protein-rich fluid responsible for body odor. Face and scalp predominantly contain sebaceous and eccrine glands, while palms and soles have only eccrine glands specialized for thermoregulation and grip.





## QUESTION

| Which of the following is a function of the marked layer?



- A Gluconeogenesis
- B Sodium and water retention**
- C Increased sex hormones
- D Immune cell interaction

CORRECT

## RIGHT ANSWER

OK

**B. Sodium and water retention**

## WHY THIS IS RIGHT

The marked layer is the zona glomerulosa of the adrenal cortex, which secretes aldosterone, a mineralocorticoid responsible for  $\text{Na}^+$  reabsorption and  $\text{K}^+$  excretion in the distal nephron. Zona fasciculata mediates gluconeogenesis via cortisol, zona reticularis produces sex steroids, and immune cell interaction is not a primary adrenal cortical function.



## QUESTION

Identify the type of joint marked in the image:



A Ball and socket

B Saddle

CORRECT

C Plane

D Gliding

RIGHT ANSWER

OK B. Saddle

## WHY THIS IS RIGHT

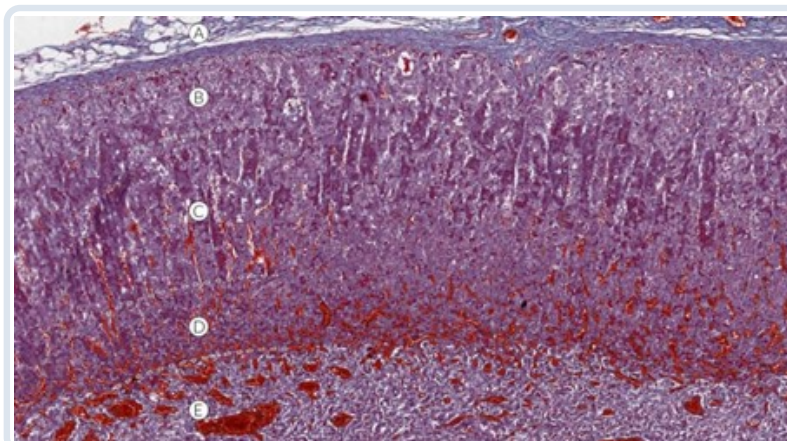
The marked joint is the incudo-malleolar joint, which is a saddle joint allowing limited reciprocal movements between malleus and incus.

The incudo-stapedial joint is a ball-and-socket joint, not saddle.

Plane/gliding joints do not permit the specialized movements required for sound transmission in the ossicular chain.

## QUESTION

Which are the hormones secreted from B,C,D,E respectively?



CORRECT

**A** B- Aldosterone, C- Cortisol, D- Androgen, E- Epinephrine

**B** B- Aldosterone, C- Androgen, D- Cortisol, E- Epinephrine

**C** B- Aldosterone, C- Epinephrine, D- Androgen, E- Cortisol

**D** B- Cortisol, C- Aldosterone, D- Androgen, E- Epinephrine

## RIGHT ANSWER

**OK** A. B- Aldosterone, C- Cortisol, D- Androgen, E- Epinephrine

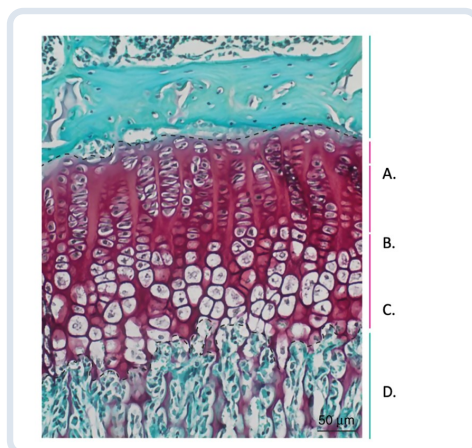
## WHY THIS IS RIGHT

No explanation was provided in the source quiz.

| Option | Zone             | Hormone Secreted                             | Function                                |
|--------|------------------|----------------------------------------------|-----------------------------------------|
| A      | Capsule          | -                                            | -                                       |
| B      | Zona Glomerulosa | Mineralocorticoids (Aldosterone)             | Regulates BP and electrolyte balance    |
| C      | Zona Fasciculata | Glucocorticoids (Cortisol)                   | Controls metabolism and immune response |
| D      | Zona Reticularis | Androgens                                    | Precursors for sex hormones             |
| E      | Adrenal Medulla  | Catecholamines (Epinephrine, Norepinephrine) | Mediates fight-or-flight response       |

## QUESTION

Calcium deposition is seen in which layer?



A A

B B

C C

D D

CORRECT

## RIGHT ANSWER

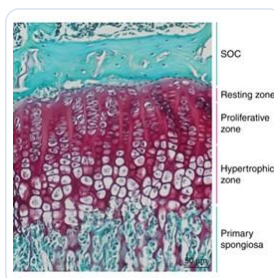
OK D. D

## WHY THIS IS RIGHT

Calcium deposition occurs in the zone of calcified cartilage, where cartilage matrix becomes mineralized before being replaced by bone.

This zone lies between the zone of hypertrophy and the zone of ossification in the epiphyseal plate.

Zones A-C represent resting, proliferative, and hypertrophic cartilage, where growth occurs but no mineralization takes place.



## QUESTION

Which joint is not formed by the bone shown in the image?



A Syndesmosis

B **Synchondrosis**

CORRECT

C Plane joint

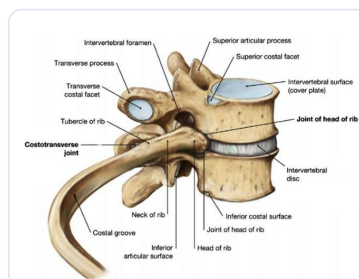
D Symphysis

## RIGHT ANSWER

OK **B. Synchondrosis**

## WHY THIS IS RIGHT

Thoracic vertebrae do not form synchondrosis (primary cartilaginous) joints; they are involved in forming plane joints, syndesmosis, and symphysis joints.



## QUESTION

Identify the structures shown in the images:



A Corpus callosum

B Psammoma body

C Corpus luteum

D Corpora amylacea

CORRECT

## RIGHT ANSWER

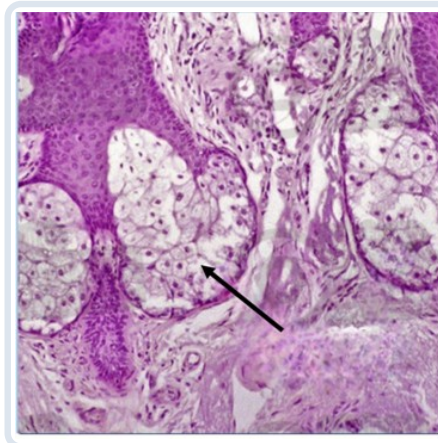
OK D. Corpora amylacea

## WHY THIS IS RIGHT

Corpora amylacea are round, laminated, eosinophilic bodies seen within glandular lumina or CNS tissue. They represent concentrically layered glycoproteinaceous material formed by degenerating cells. Commonly seen in prostate, lung, and brain with aging or chronic inflammation. Psammoma bodies are calcified, basophilic, and tumor-associated, while corpus luteum and corpus callosum are gross anatomical structures.

## QUESTION

Identify the type of gland marked in the image?



A Merocrine

B Eccrine

C **Holocrine**

CORRECT

D None

## RIGHT ANSWER

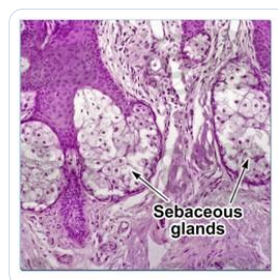
OK C. Holocrine

## WHY THIS IS RIGHT

The correct answer is Holocrine.

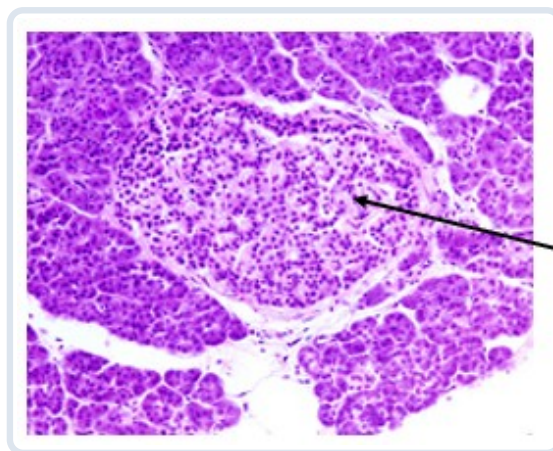
Sebaceous glands are holocrine glands where entire cells disintegrate to release sebum into the hair follicle.

Merocrine secretion (e.g., salivary glands, pancreas) releases products by exocytosis without cell loss, while eccrine glands are sweat glands using merocrine mechanism, not a separate mode.



## QUESTION

In the histological section shown, how do the cells in the highlighted cluster most commonly exert their influence on neighbouring pancreatic cells?



A Portal vasculature

B Paracrine effect

CORRECT

C Transformation from epithelial to mesothelial

D Nerve mediated

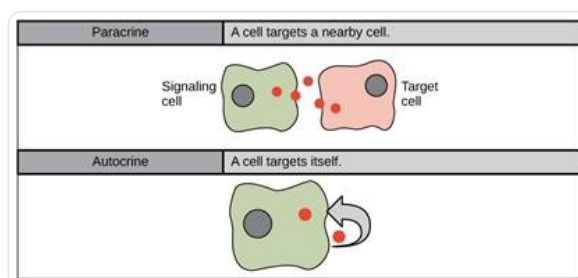
## RIGHT ANSWER

OK

B. Paracrine effect

## WHY THIS IS RIGHT

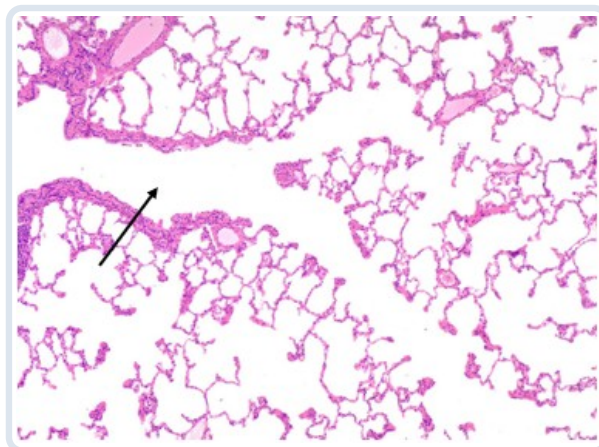
The marked cluster of cells represents the Islets of Langerhans within pancreatic tissue. The histological image shows the characteristic appearance of pancreatic parenchyma with dark eosinophilic areas representing serous acinar cells (exocrine pancreas) and lighter, less eosinophilic areas representing the islets of Langerhans (endocrine pancreas).





## QUESTION

Identify the marked structure from the histological slide given below?



A Respiratory bronchus

B Bronchus

C Terminal bronchus

CORRECT

D Alveoli

## RIGHT ANSWER

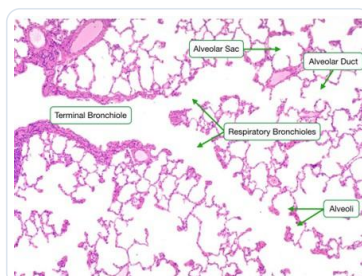
OK

C. Terminal bronchus

## WHY THIS IS RIGHT

This histological image shows a section of lung tissue displaying various components of the respiratory pathway. The marked structure represents a terminal bronchiole (terminal bronchus), which is characterized by its relatively thick muscular wall compared to the surrounding structures.

The respiratory pathway follows a hierarchical organization: primary bronchus -> secondary bronchus -> tertiary bronchus (supplying bronchopulmonary segments) -> terminal bronchioles -> respiratory bronchioles -> alveolar ducts -> alveolar sacs -> alveoli.





## QUESTION

| Which of the following does not have an endocrine component?

- A** [https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions\\_image/option/01KKDPB7Y9Y8ET3ZKGYCFWF7A6.jpg](https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions_image/option/01KKDPB7Y9Y8ET3ZKGYCFWF7A6.jpg)
- B** [https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions\\_image/option/01KKDPB80WEKWP0AB63R991BW3.jpg](https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions_image/option/01KKDPB80WEKWP0AB63R991BW3.jpg) CORRECT
- C** [https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions\\_image/option/01KKDPB83KPAMWPM5RT479M2MA.jpg](https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions_image/option/01KKDPB83KPAMWPM5RT479M2MA.jpg)
- D** [https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions\\_image/option/01KKDPB861FTMBFR8A5FHR0VC.jpg](https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions_image/option/01KKDPB861FTMBFR8A5FHR0VC.jpg)

## RIGHT ANSWER

- OK** **B.** [https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions\\_image/option/01KKDPB80WEKWP0AB63R991BW3.jpg](https://corebtr-assets-production.s3.ap-south-1.amazonaws.com/questions_image/option/01KKDPB80WEKWP0AB63R991BW3.jpg)

## WHY THIS IS RIGHT

The correct answer is B (Uterus).

Testis (A) has Leydig cells, ovary (C) has follicles and corpus luteum, and pancreas (D) has islets of Langerhans, all providing endocrine function.

The uterus is a purely target organ for hormones and has no intrinsic endocrine component.