



WITH NOTES

Anatomy of Dural Folds & Sinuses

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M N U



Meninges

❖ Layers of the meninges:

❑ Pia Mater (inner layer):

- Delicate.
- Highly vascular.
- Closely adherent to brain & Spinal cord.

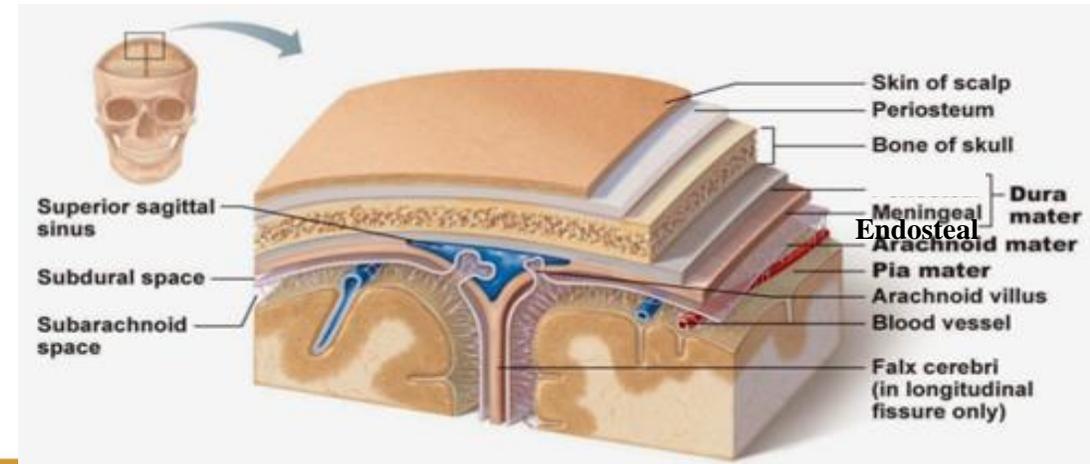
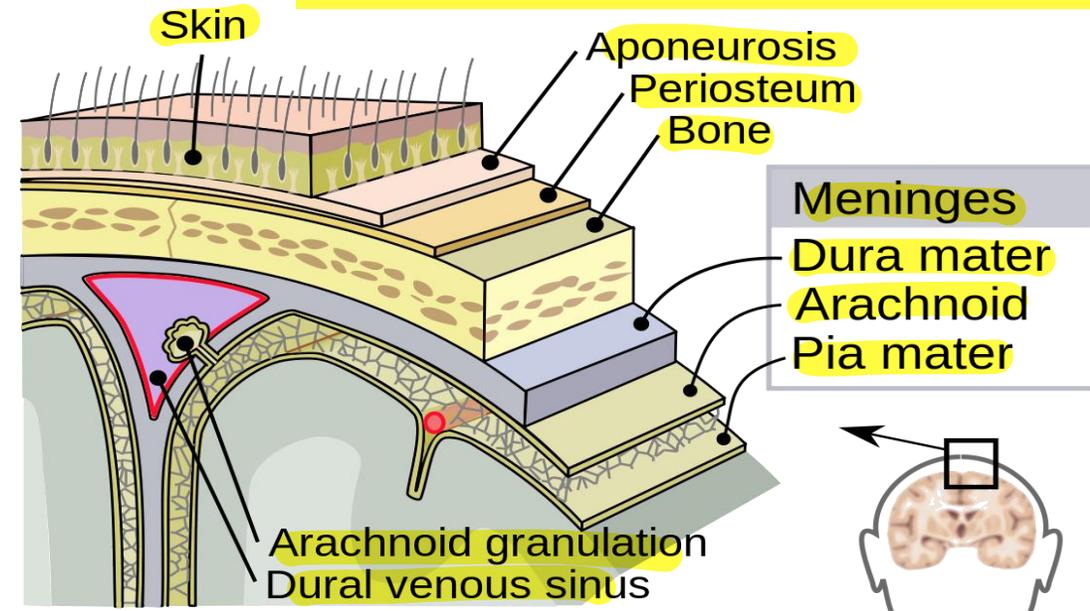
❑ Arachnoid Mater (Middle layer):

- Delicate.
- Non-vascular.
- Forms arachnoid granulations & villi.

❑ Dura Mater (outer layer):

Related to dural folds

- Dense & Fibrous.
- Cranial dura has 2 layers:
 - ❖ Outer Endosteal layer.
 - ❖ Inner Meningeal layer.

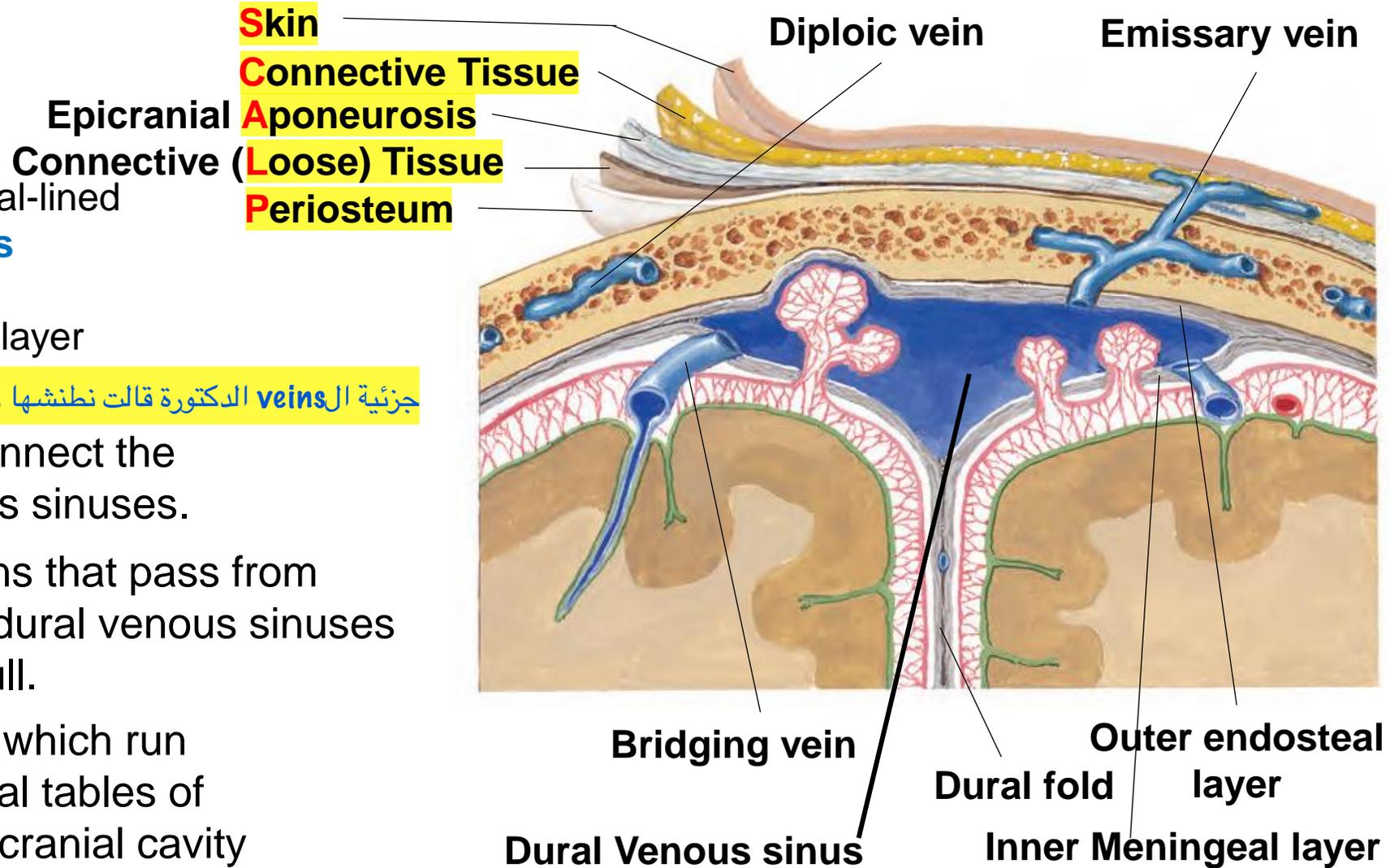


Dura Mater

- Cranial dura has 2 layers:
 - ❖ Outer Endosteal layer.
 - ❖ Inner Meningeal layer.
- Between the two layers are endothelial-lined spaces called **Dural Venous Sinuses**
 Drain into **Internal jugular veins**.
- Reduplication of the inner meningeal layer forms **Dural Folds**.

جزئية الveins الدكتورة قالت نطنشها .. سكيب 🙄

- ❖ **Bridging veins:** Veins which connect the cerebral cortex with dural venous sinuses.
- ❖ **Emissary veins:** Valveless veins that pass from outside the cranial cavity to the dural venous sinuses through different foramina of skull.
- ❖ **Diploic veins:** Valveless veins which run between the internal and external tables of compact bone in the roof of the cranial cavity



Dural Folds

❖ Dura Folds:

❑ **Definition:** reduplication of the inner meningeal layer of the dura

❑ **Number:** 4

❑ **The name has two parts:**

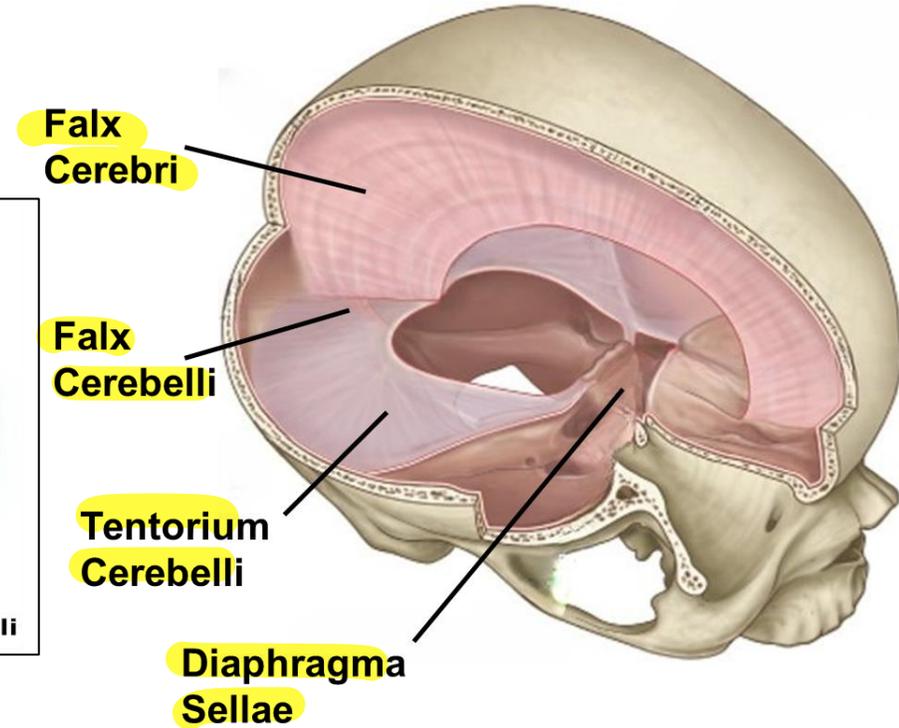
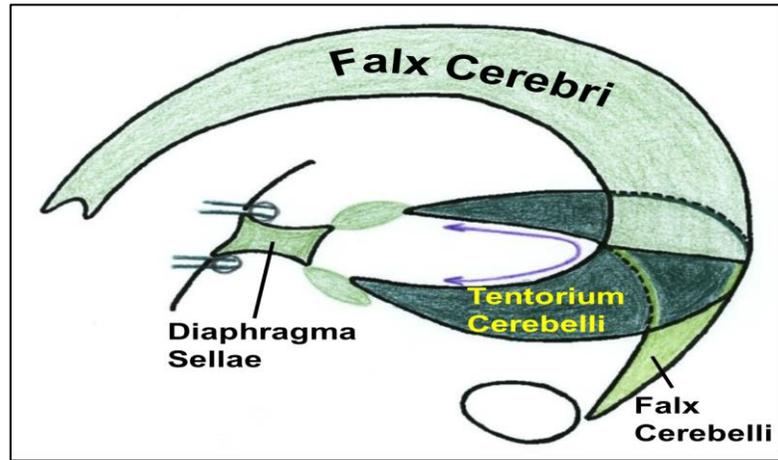
- **Shape**
- **Site**

❑ **Names:**

- **Falx Cerebri**
- **Falx Cerebelli**
- **Tentorium Cerebelli**
- **Diaphragma Sellae**

Vertical

Horizontal



Related dural fold & associated sinus

أو يشاور على ال sinus

Dural Folds: Falx Cerebri

❖ Falx Cerebri:

❑ **Site:** Between the two cerebral hemispheres

❑ **Shape:** Sickle-shaped (crescent) fold

❑ **Attachment:**

- **Apex:** attached to the frontal crest and crista galli.

- **Base:** attached to the superior surface of the tentorium cerebelli.

❑ **Sinuses:**

- **Superior sagittal sinus:** in the upper margin.
- **Inferior sagittal sinus:** in the posterior two thirds of the lower margin.
- **Straight sinus:** at the junction of the falx cerebri with the tentorium cerebelli in the median plane.

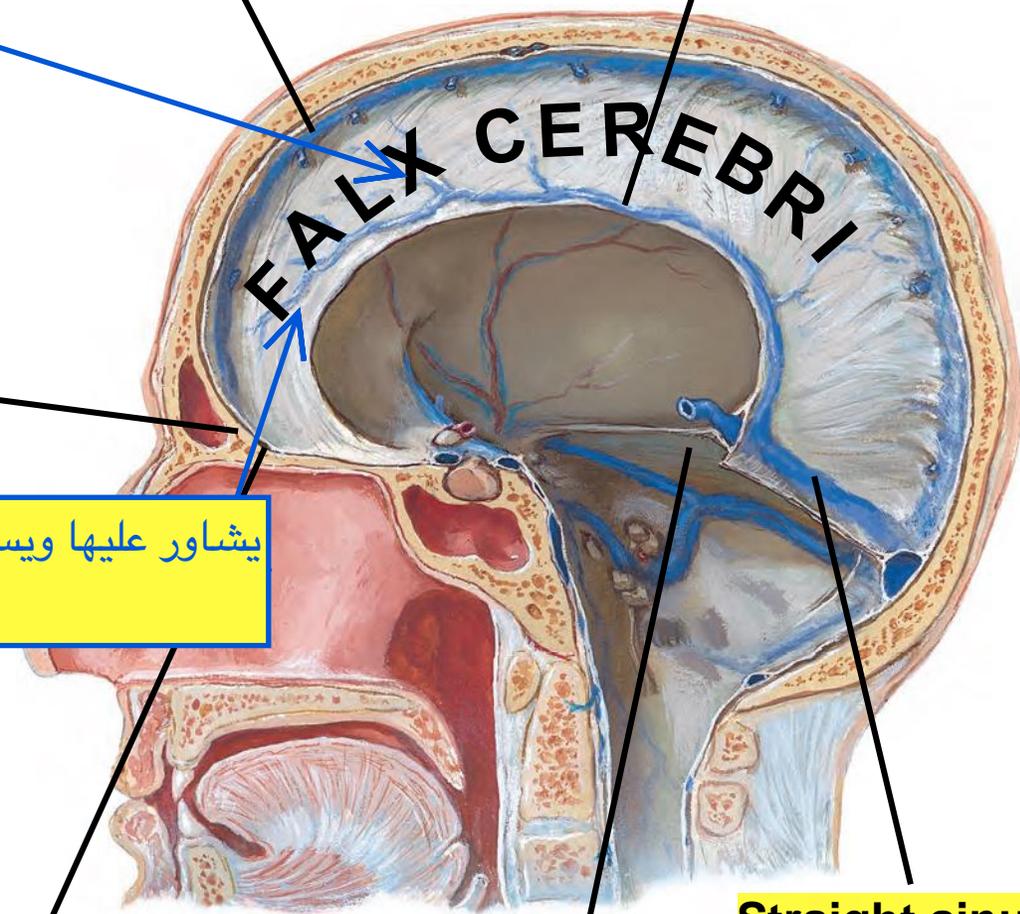
يشاور عليها ويسألك ايه ال related sinuses



Superior Sagittal Sinus

Inferior Sagittal Sinus

يشاور عليها ويسألك ايه ال related sinuses
Attached dural fold ?



Crista Galli of ethmoid Tentorium Cerebelli

Straight sinus



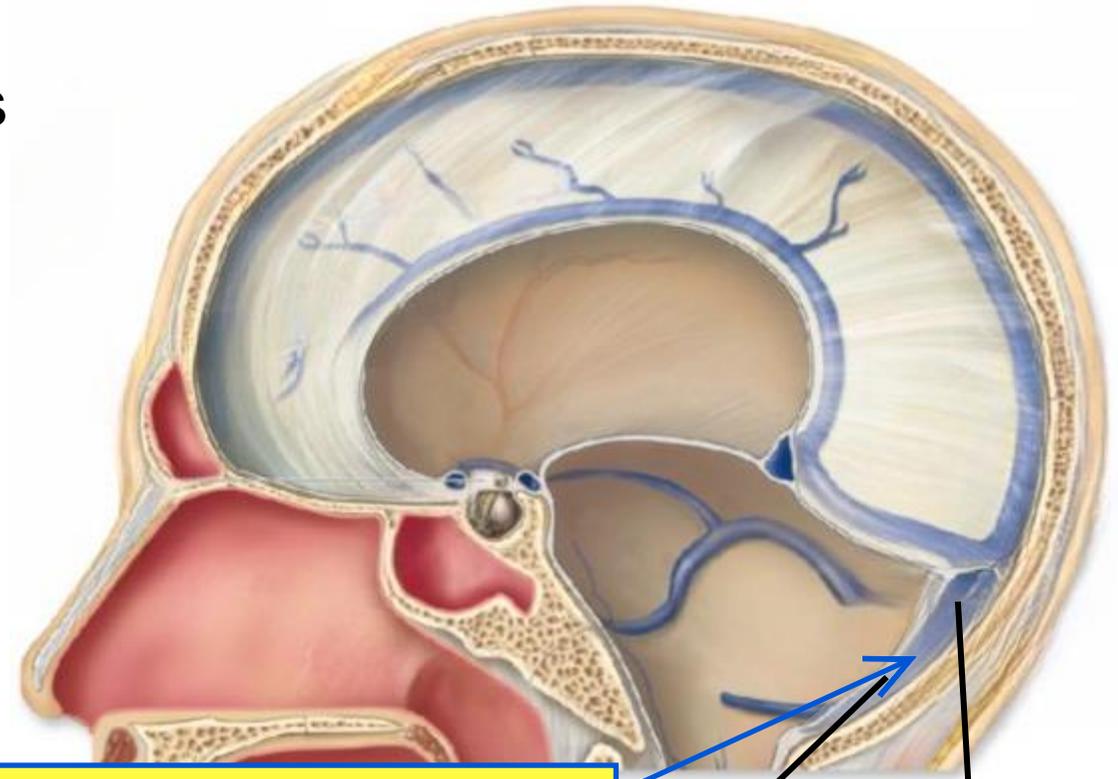
Dural Folds: Falx Cerebelli

❖ Falx Cerebelli:

- ❑ **Site:** Between the two cerebellar hemispheres
- ❑ **Shape:** Triangular fold ▲
- ❑ **Attachment:**
 - **Apex:** attached to the posterior border of the foramen magnum.
 - **Base:** attached to the inferior surface of the tentorium cerebelli.

❑ Sinuses:

- **Occipital sinus:** in its posterior border



يتشاور عليها ويسألك ايه ال related sinuses
Attached dural fold ?

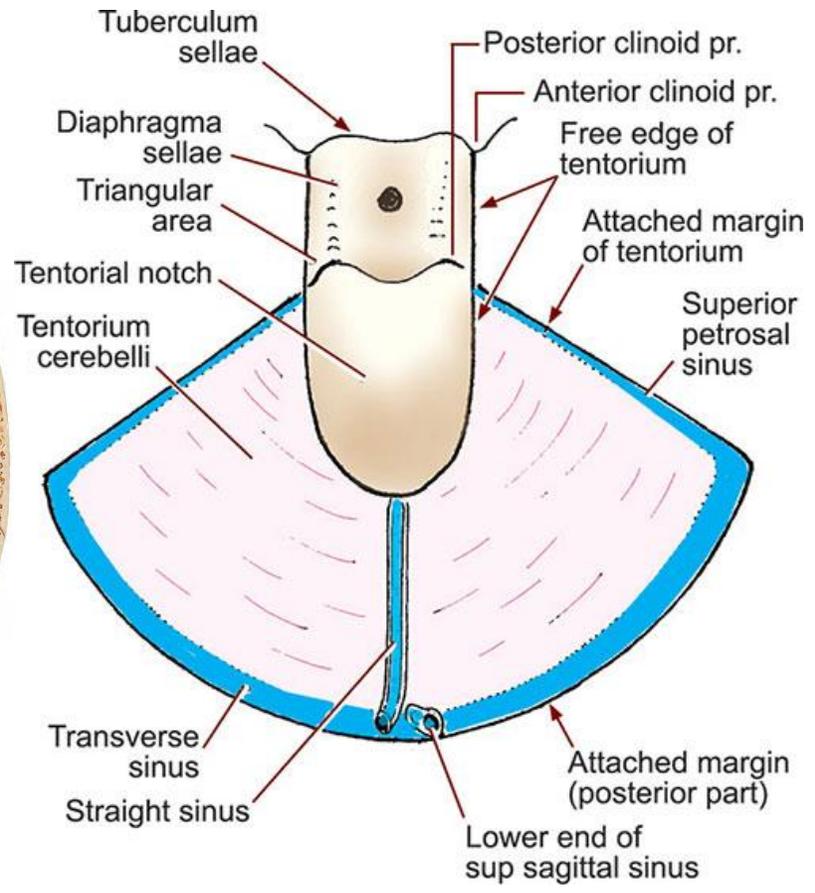
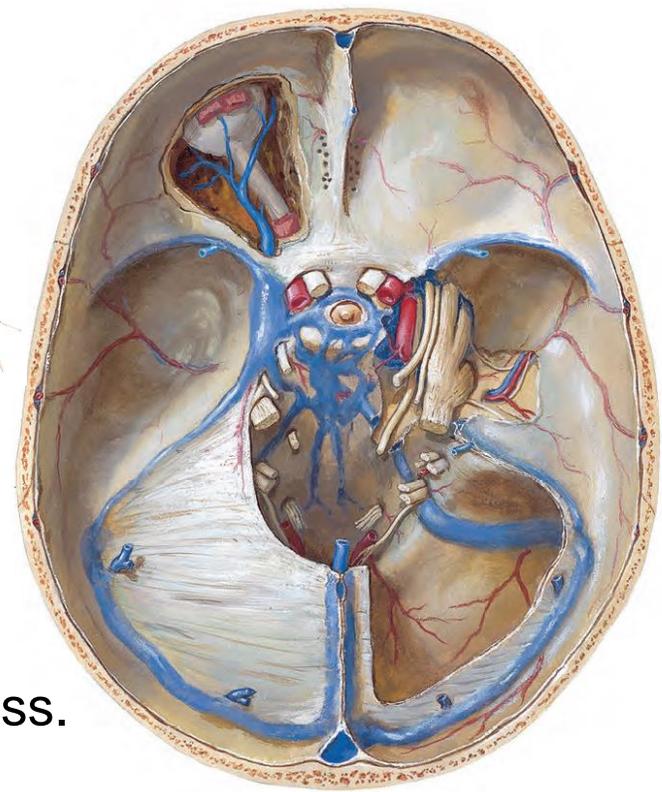
Occipital sinus

Falx Cerebelli

Dural Folds: Tentorium Cerebelli

❖ Tentorium Cerebelli:

- ❑ **Site:** Between the cerebrum & cerebellum
- ❑ **Shape:** Tent-shaped fold
- ❑ **Attachment:**
 - **Free anterior border:**
 - ❖ U-shaped border that surrounds the midbrain (tentorial notch).
 - ❖ Attached to anterior clinoid process.
 - **Attached Posterior border:**
 - ❖ Posterior clinoid process.
 - ❖ Upper border of petrous part of temporal bone.
 - ❖ Margins of groove for the transverse sinus.

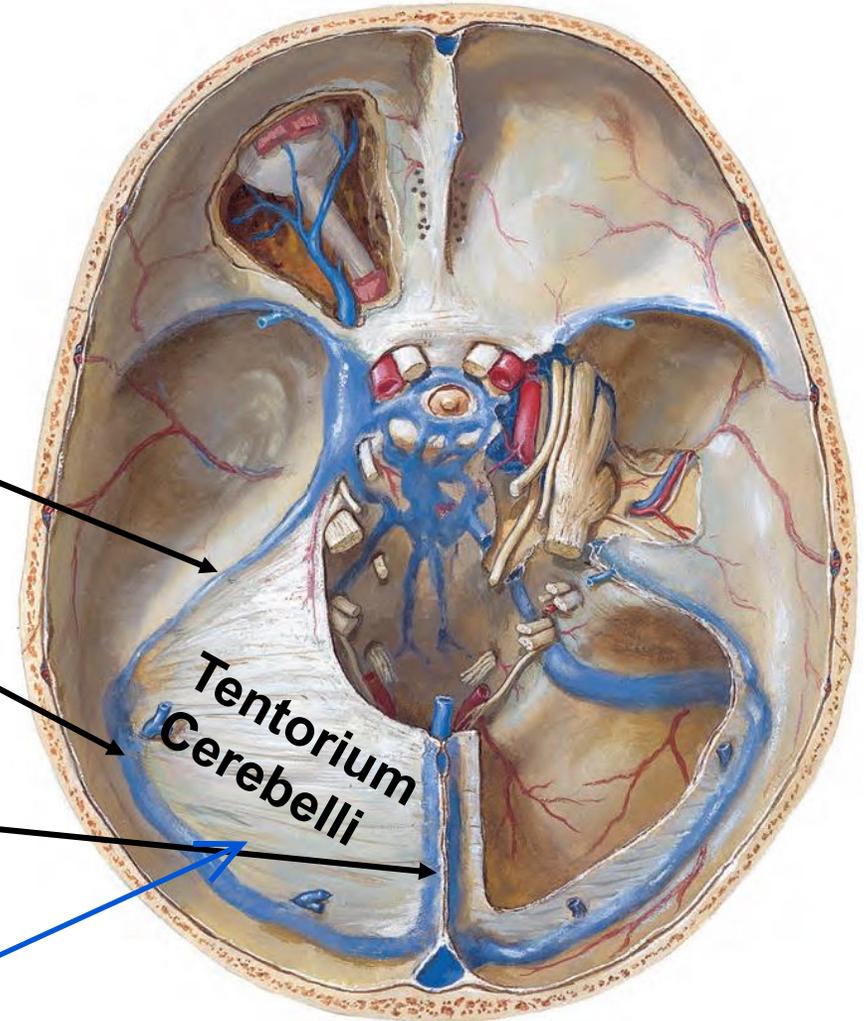


Dural Folds: Tentorium Cerebelli

❖ Tentorium Cerebelli:

□ Sinuses:

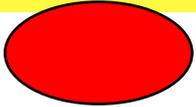
- **The superior petrosal sinus:**
at the upper border of petrous part of the temporal bone.
- **The transverse sinus:**
at the groove of the transverse sinus
- **The straight sinus:**
at the junction of the falx cerebri with the tentorium cerebelli in the median plane.



يشاور عليها ويسألك ايه ال related sinuses
Attached dural fold ?

Dural Folds: Diaphragma Sellae

❖ Diaphragma Sellae:

❑ **Shape:** Oval 

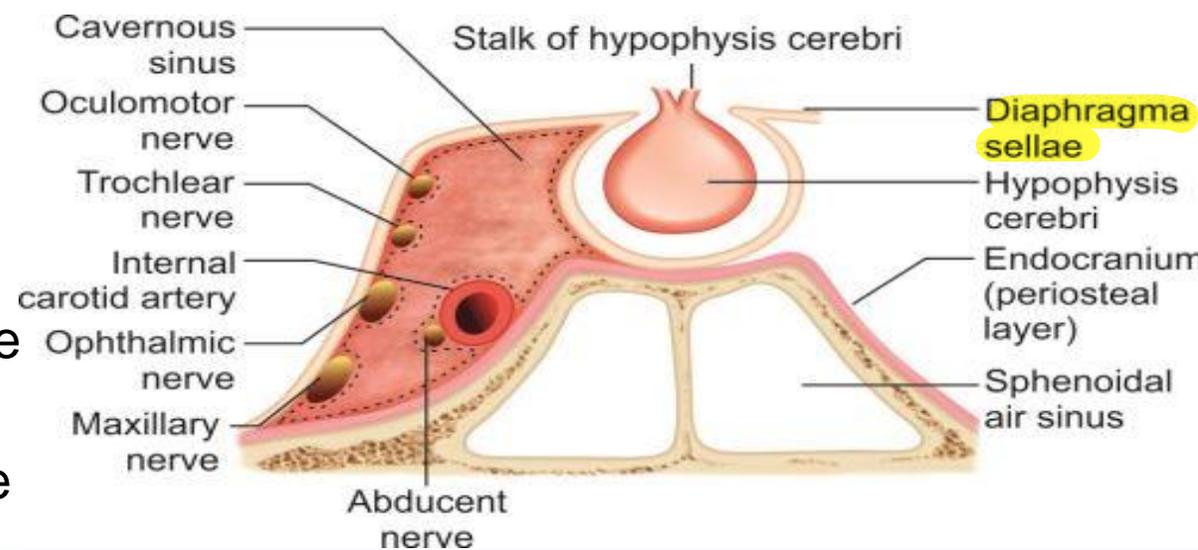
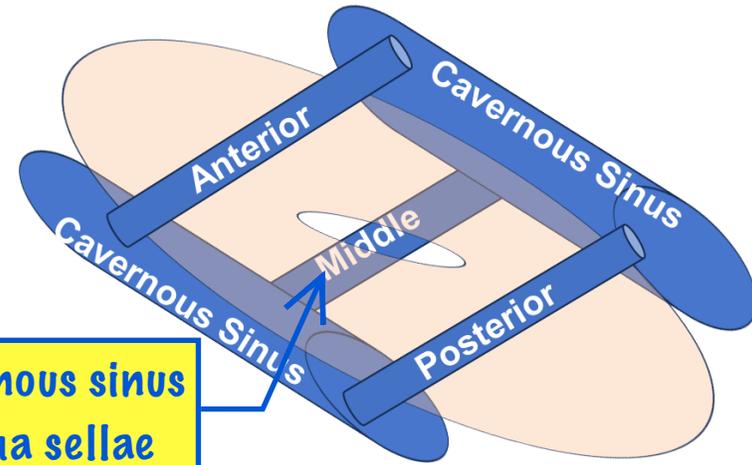
❑ **Attachment:**

- **Anteriorly:** to the tuberculum sellae between the anterior clinoid processes.
- **Posteriorly:** to the dorsum sellae between the posterior clinoid processes.
- Transmits the **infundibulum (stalk)** of the pituitary gland through a central hole.

❑ **Sinuses:**

- **Inter-cavernous Sinuses:** Connect the two cavernous sinuses
 - ✓ Anterior → Above diaphragma sellae
 - ✓ Middle: below it **MCQ**
 - ✓ Posterior → Above diaphragma sellae

Only intercavernous sinus below diaphragma sellae



Dural Sinuses

Single Sinuses

1. Superior Sagittal Sinus
2. Inferior Sagittal Sinus
3. Straight Sinus
4. Occipital Sinus
5. Basilar plexus of veins
6. Inter-cavernous sinuses:
 - a) Anterior
 - b) Middle
 - c) Posterior

For each sinus:

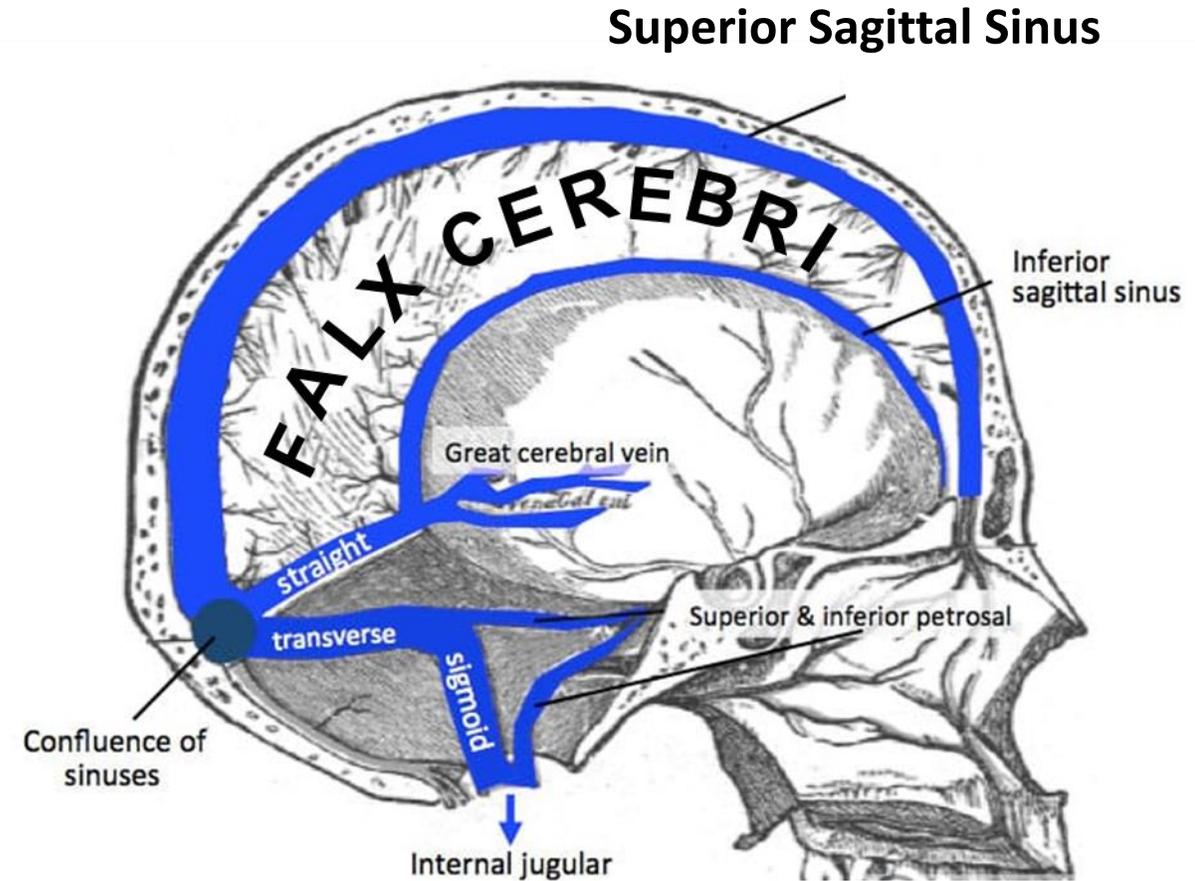
1. Site
2. Origin
3. Termination

Paired Sinuses

1. Spheno-parietal Sinus
2. Cavernous Sinus
3. Superior Petrosal Sinus
4. Inferior Petrosal Sinus
5. Transverse Sinus
6. Sigmoid Sinus

Superior Sagittal Sinus

- ❑ **Beginning:** At the apex of falx cerebri above crista galli
- ❑ **Site:** In the upper convex border of falx cerebri
- ❑ **Termination:**
 - **Usually:** turns to the right and continues as the right transverse sinus.
 - **Sometimes,** unites with the straight sinus to form confluence of sinuses, which gives right and left venous sinuses



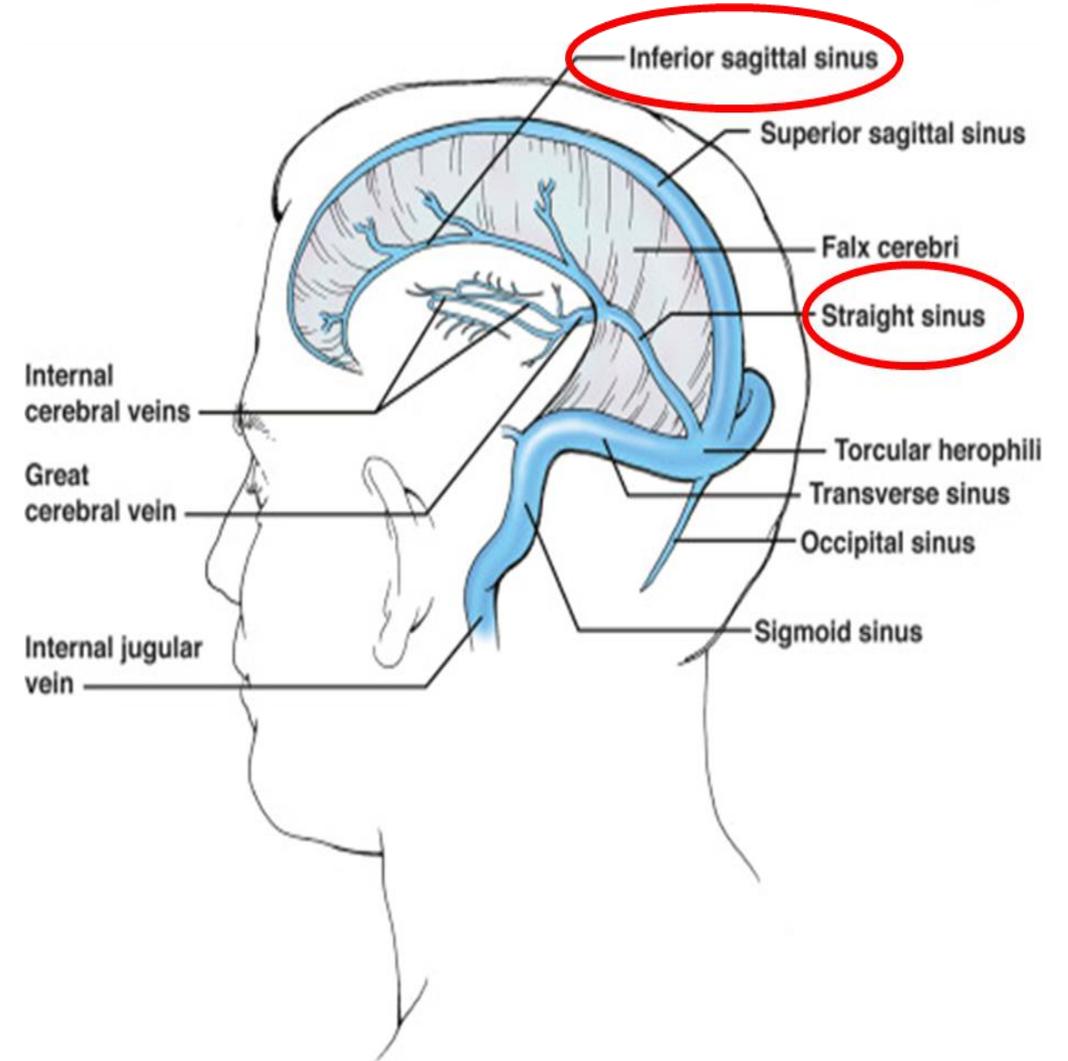
Inferior Sagittal & Straight Sinuses

❖ Inferior Sagittal Sinus:

- ❑ **Site:** In the posterior 2/3 of the lower free margin of falx cerebri
- ❑ **Termination:**
Joins the great cerebral vein (of Galen) to form the **straight sinus** at the anterior free border of tentorium cerebelli.

❖ Straight Sinus:

- ❑ **Site:** along a line at the junction of the base of the falx cerebri with the tentorium cerebelli
- ❑ **Termination:**
 - Mainly turns to the **left** forming the **left transverse sinus**
 - May open into **confluence of sinuses**



Transverse Sinuses

❖ Transverse Sinuses:

❑ Beginning:

❑ Usually:

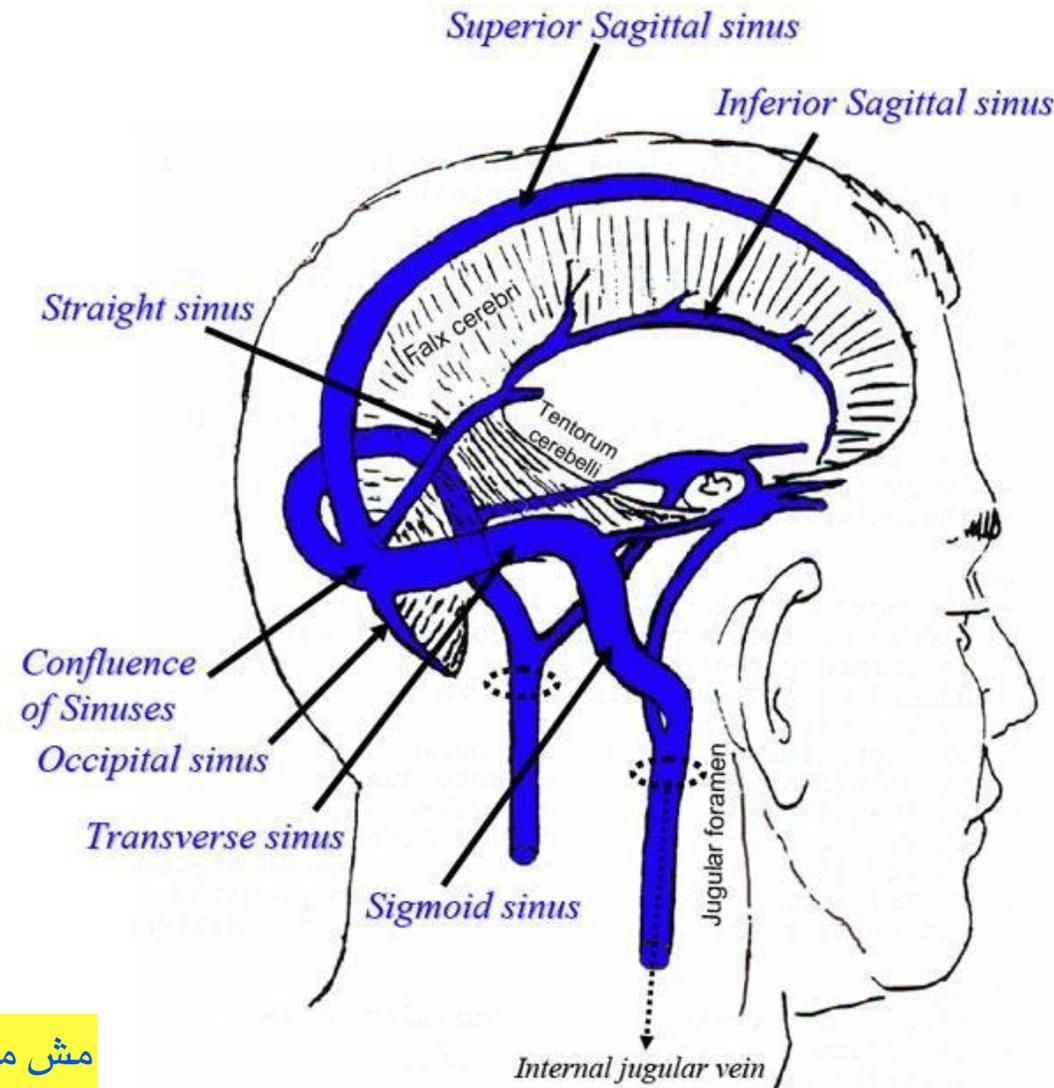
- Right side from the superior sagittal sinus
- Left side: from the straight sinus

❑ Or may come from confluence of sinuses.

❑ Site: Along the transverse groove of the occipital bone in the attached margin of the tentorium cerebelli.

❑ Termination: Opposite the mastoid process by becoming the sigmoid sinus.

❑ Tributaries: Superior petrosal sinus. **مش مهمة Tributaries**



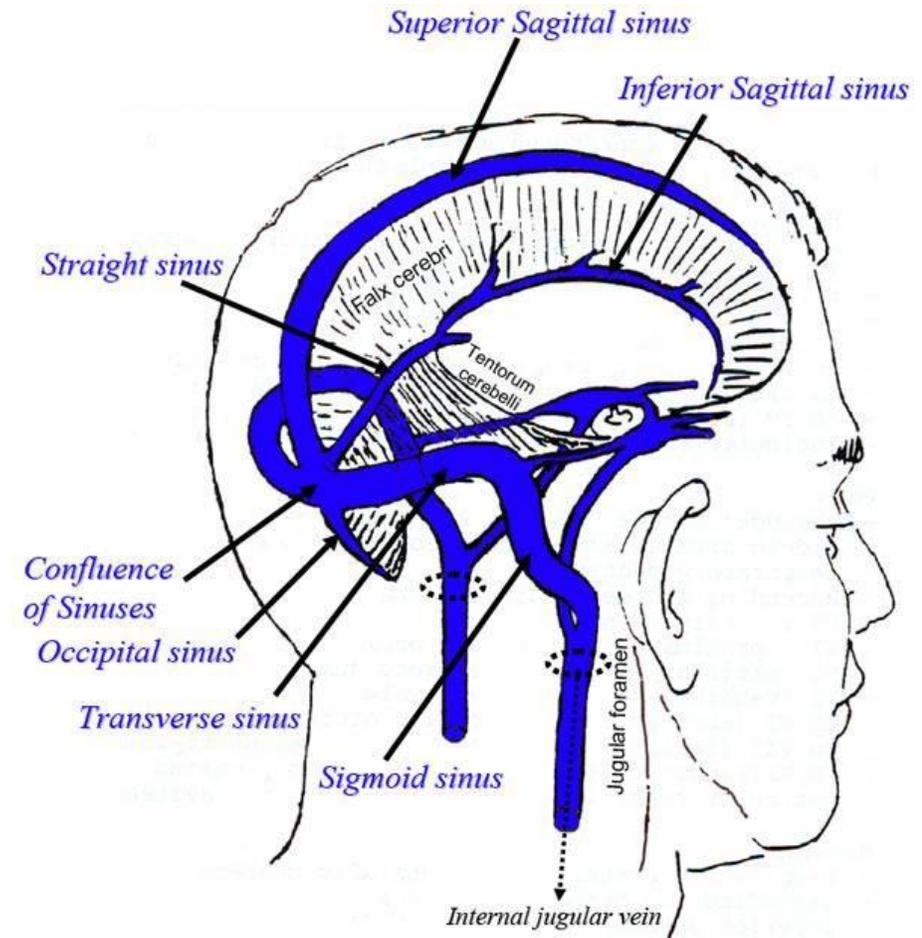
Sigmoid and Occipital sinuses

❖ Sigmoid Sinuses:

- ❑ **Beginning:** Continuation of the transverse sinuses opposite the mastoid processes.
- ❑ **Site:** In the grooves for sigmoid sinus.
- ❑ **Termination:** Passes through the jugular foramen of the temporal bone to become the Internal jugular vein on each side.
- ❑ **Tributaries:** Occipital Sinus **مش مهمة Tributaries**

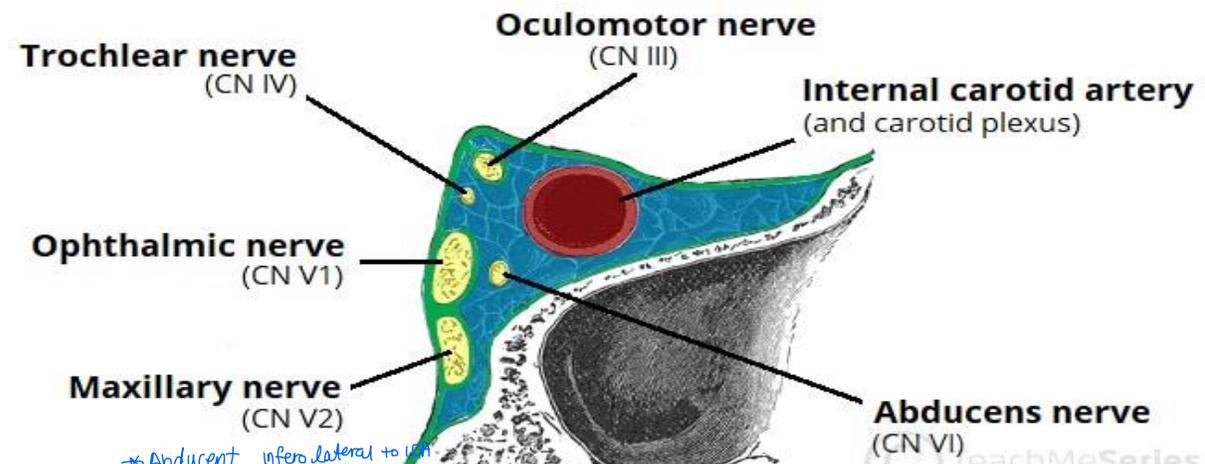
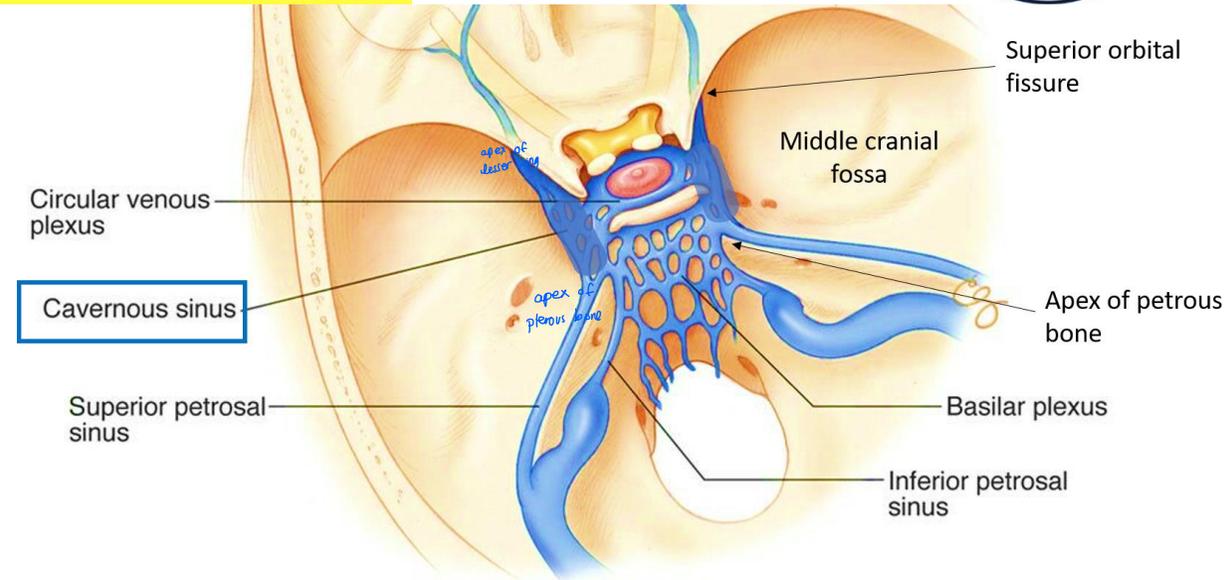
❖ Occipital Sinus:

- ❑ **Beginning:** From the 2 transverse sinuses
- ❑ **Site:** In the attached margin of the falx cerebelli.
- ❑ **Termination:** Into confluence of sinuses or Sigmoid sinus.



Cavernous Sinus

- ❑ **Site:** In the middle cranial fossa on either side of the pituitary gland and sella turcica.
- ❑ **Extent:** from the medial end of the superior orbital fissure to the apex of the petrous part of temporal bone. 😊 extent لل
- ❑ **Relations:** Medially & Inferiorly to the body of the sphenoid & pituitary gland
- ❑ **Structures inside:**
 1. Internal Carotid Artery (ICA).
 2. Abducent nerve: lies inferolateral to the ICA.
- ❑ **Structures in the lateral wall:**
 1. Oculomotor nerve (CN III)
 2. Trochlear nerve (CN IV)
 3. Ophthalmic nerve (CN V1)
 4. Maxillary nerve (CN V2)



Enumerate nerve , arrangement , structure in these structure ?

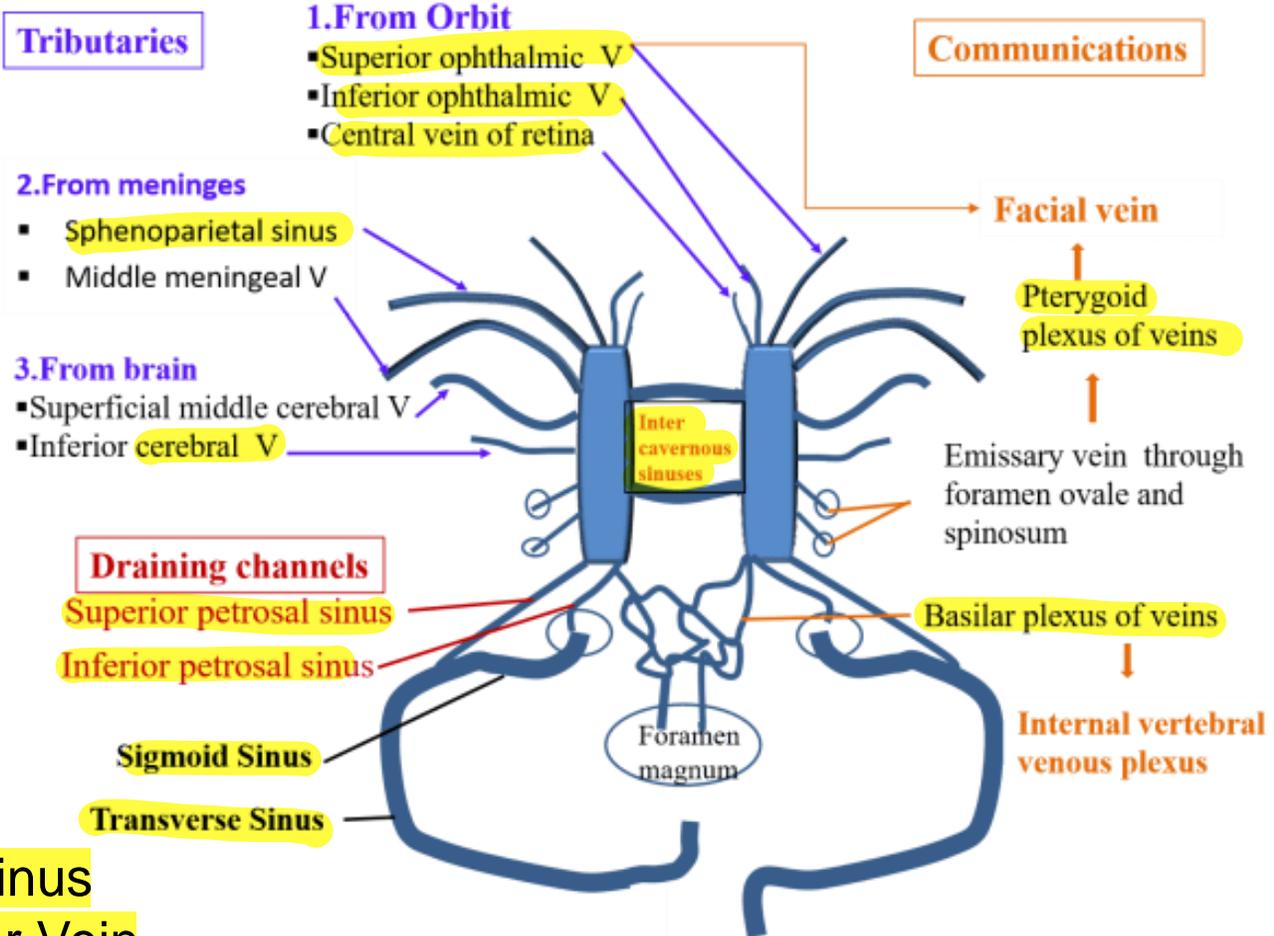
لو كله اكتبني معاهم ٦ أما لو حدد ال lateral wall فنكتب بتوع ال lateral بس

Cavernous Sinus

❑ Tributaries & Communications: سؤال مهم

- ❖ **Medially:** Communicate with each other with 3 inter-cavernous sinuses
- ❖ **Anteriorly:**
 1. Ophthalmic vein: connecting it with anterior facial vein.
 2. Central vein of the retina.
 3. Sphenoparietal sinus.
- ❖ **Superiorly:** Cerebral veins.
- ❖ **Inferiorly:** emissary veins connecting it with the pterygoid and pharyngeal plexus.
- ❖ **Posteriorly (Termination):**
 1. Superior petrosal sinus → Transverse sinus
 2. Inferior petrosal sinus → Internal Jugular Vein

← يعمل الـ basilar plexus of veins



لو جالك صورة وشاور على ال internal jugular vein وقالك ايه ال related sinus

A) inferior petrosal sinus & sigmoid sinus

Sphenoparietal and petrosal sinuses

❖ Sphenoparietal sinus:

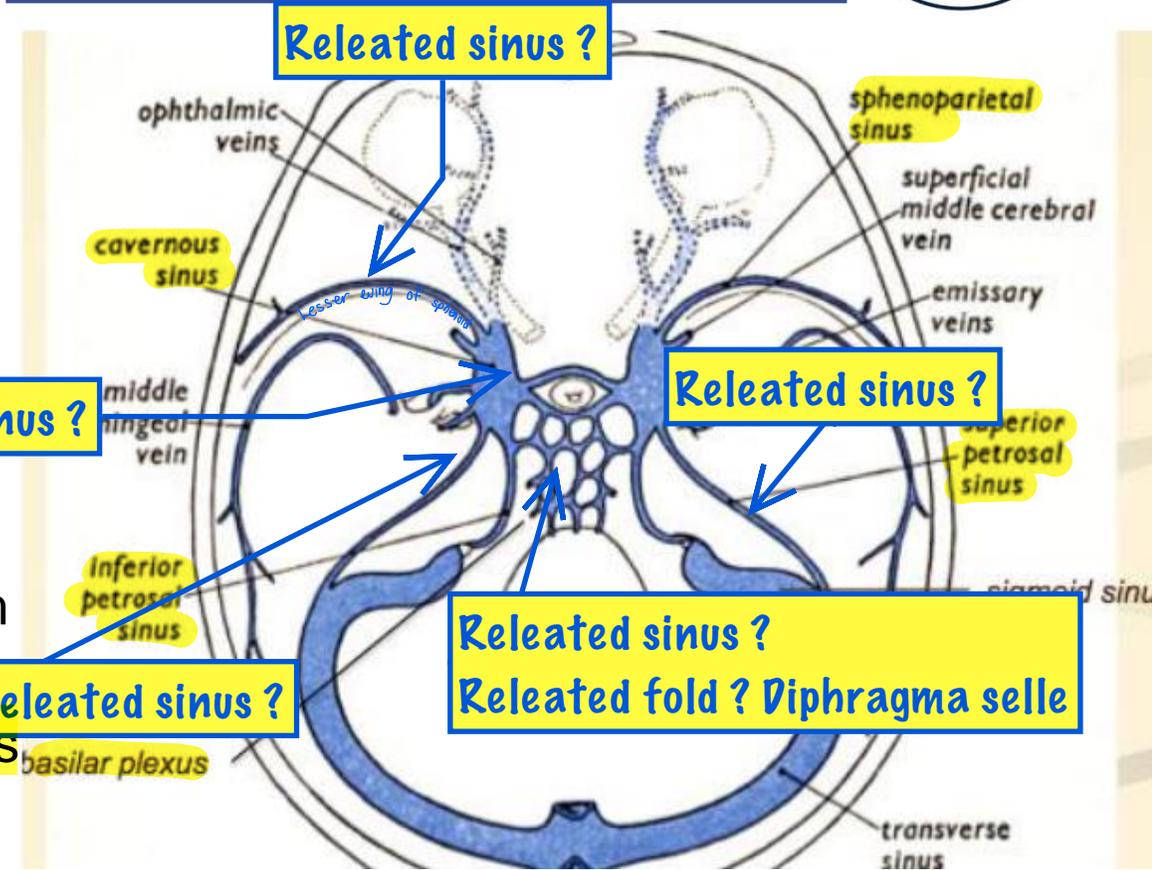
- ❑ **Site:** Along the free border of the lesser wing of sphenoid.
- ❑ **Termination:** Into the anterolateral aspect of the cavernous sinus

❖ Superior petrosal sinus:

- ❑ **Site:** along the upper border of petrous part of the temporal bone in the attached margin of the tentorium cerebelli
- ❑ **Connection:** Cavernous sinus → Transverse Sinus

❖ Inferior petrosal sinus:

- ❑ **Site:** between the petrous temporal and occipital bones.
- ❑ **Connection:** Cavernous sinus → Internal Jugular vein



Basilar plexus and Intercavernous sinuses

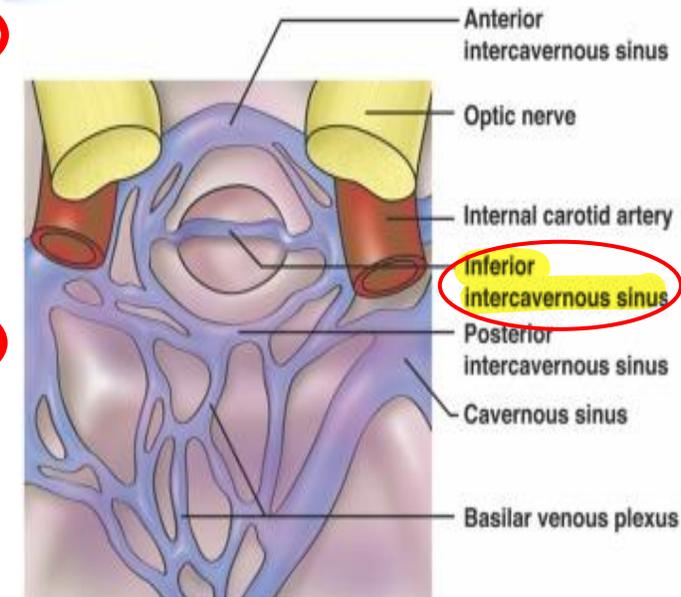
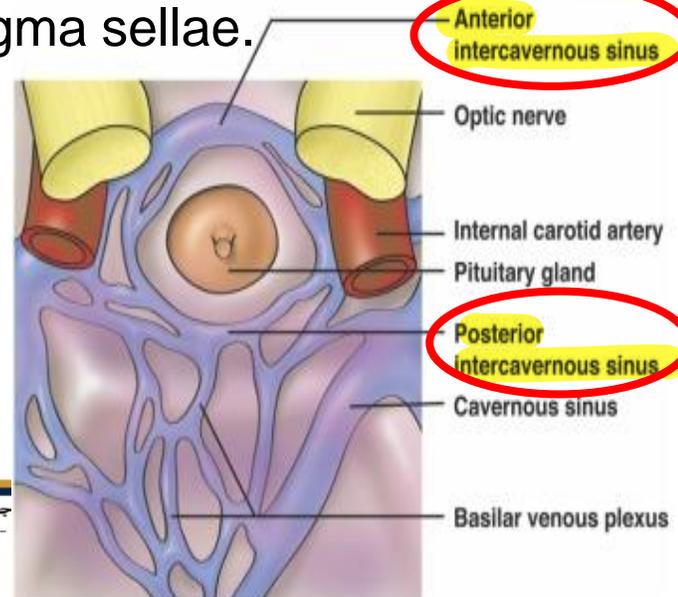
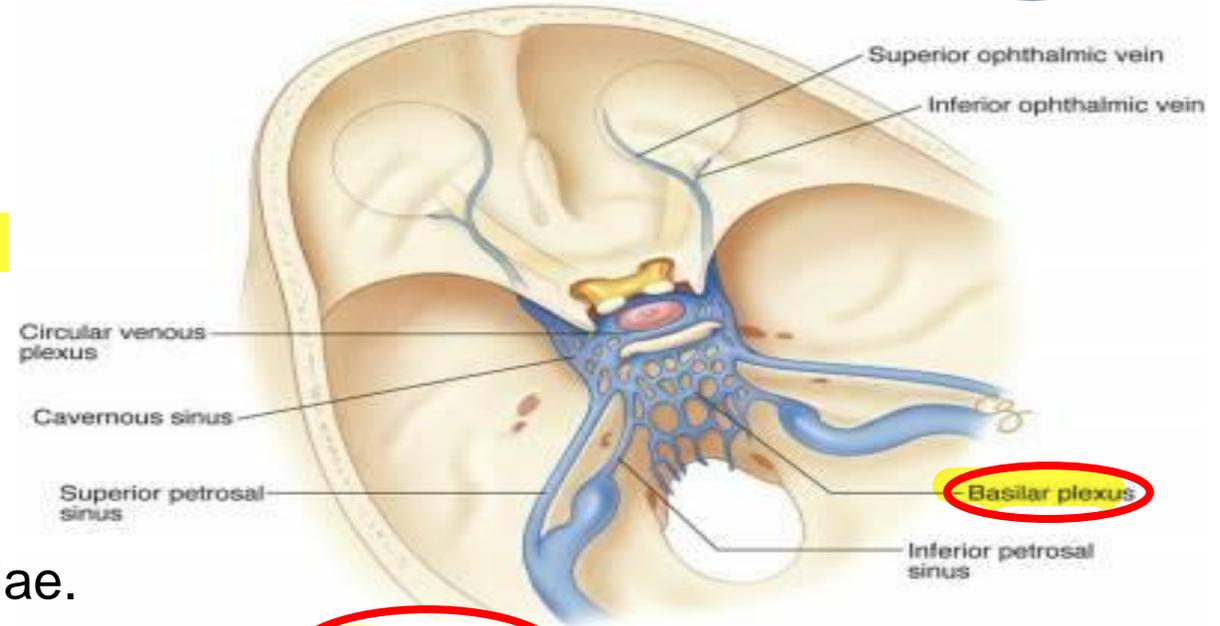
❖ Basilar Venous Plexus:

- ❑ **Site:** Lying on the clivus of the skull
- ❑ **Connection:** Connects the two inferior petrosal sinuses together.

❖ Inter-cavernous Sinuses:

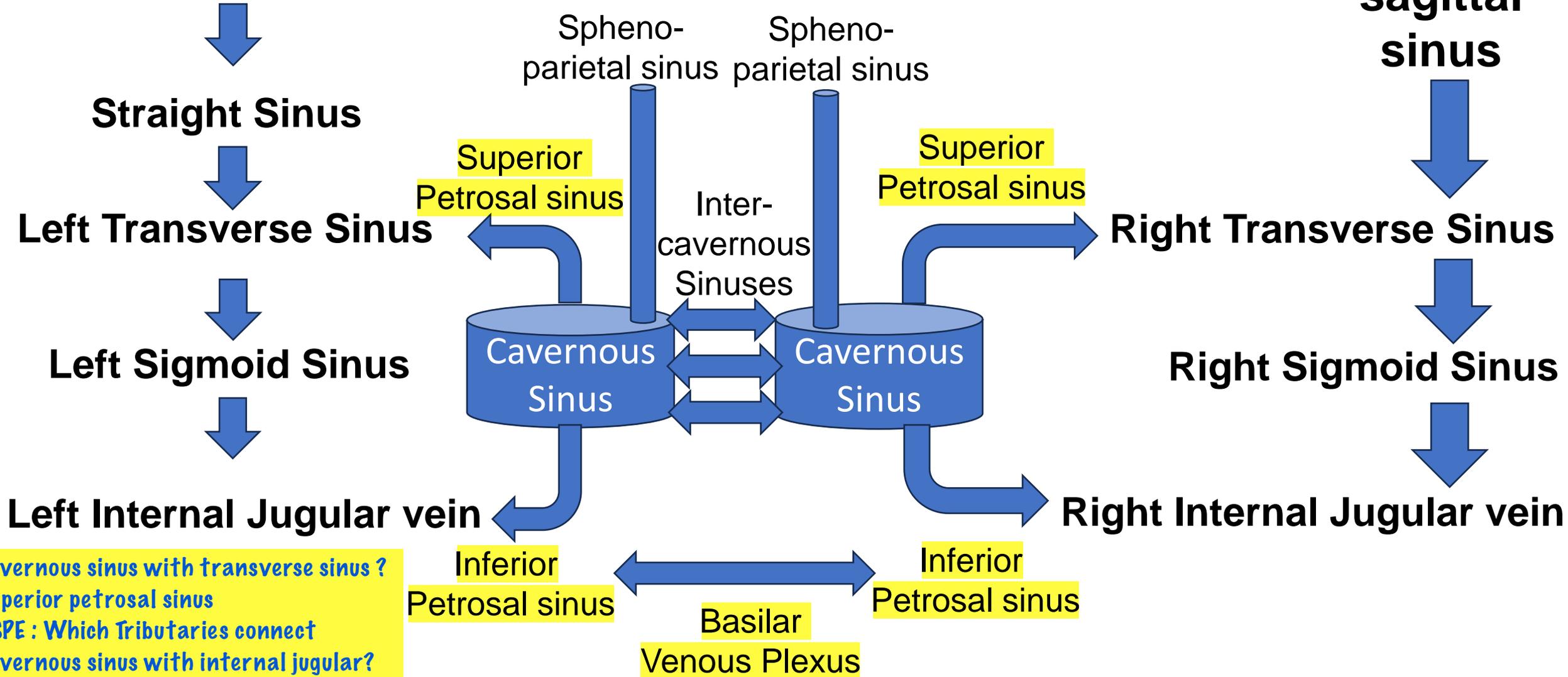
- ❑ **Site:**
 1. **Anterior:** in the anterior margin of diaphragma sellae.
 2. **Posterior:** in the posterior margin of diaphragma sellae.
 3. **Middle:** below the pituitary gland.

- ❑ **Connection:**
Connect the two cavernous sinuses



Summary of Dural venous Sinus connections

Great cerebral vein + Inferior sagittal sinus



cavernous sinus with transverse sinus ?
Superior petrosal sinus
OSPE : Which Tributaries connect cavernous sinus with internal jugular?



WITH NOTES

Thyroid and Parathyroid gland

DR. Dina Badawi

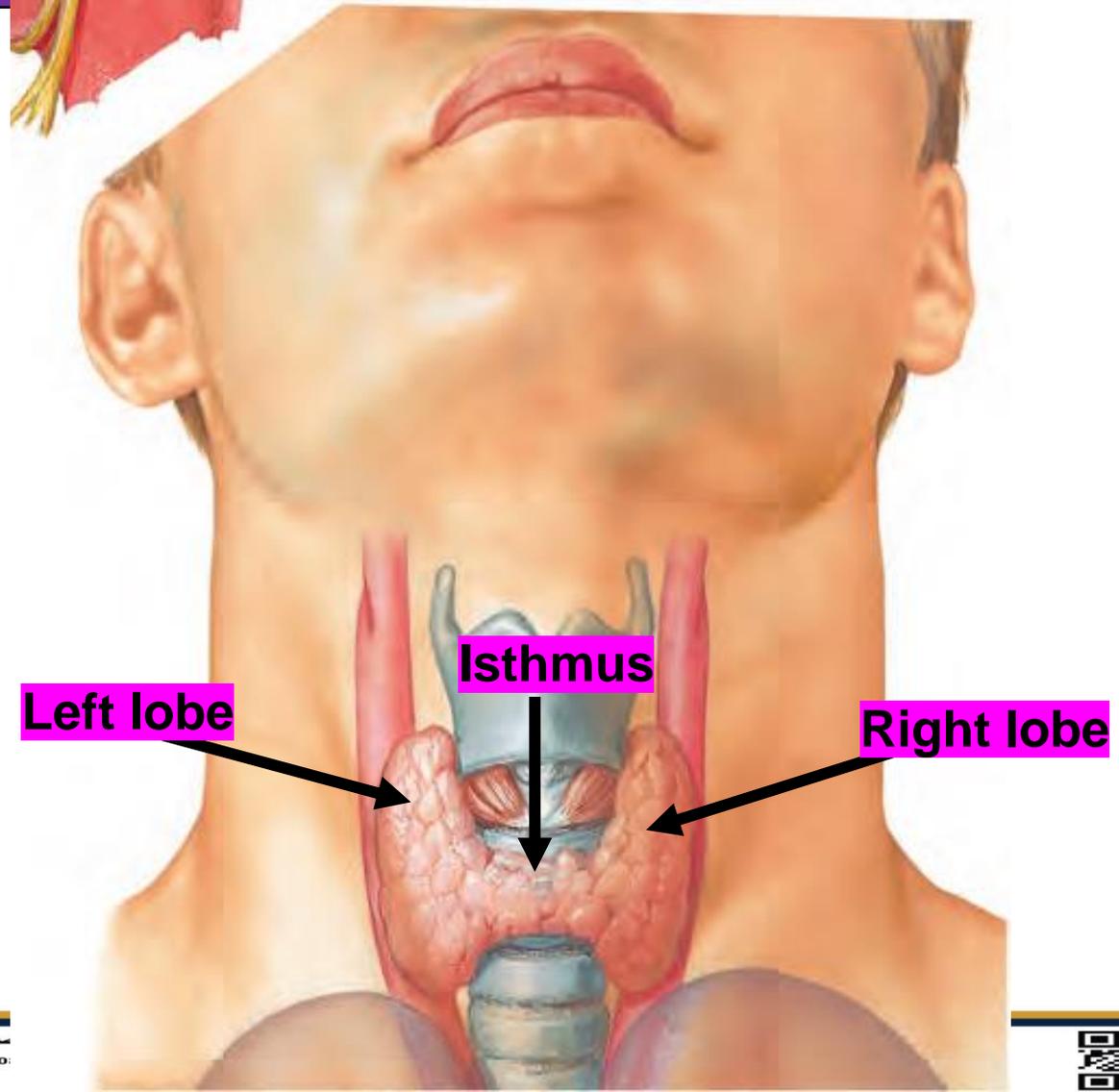
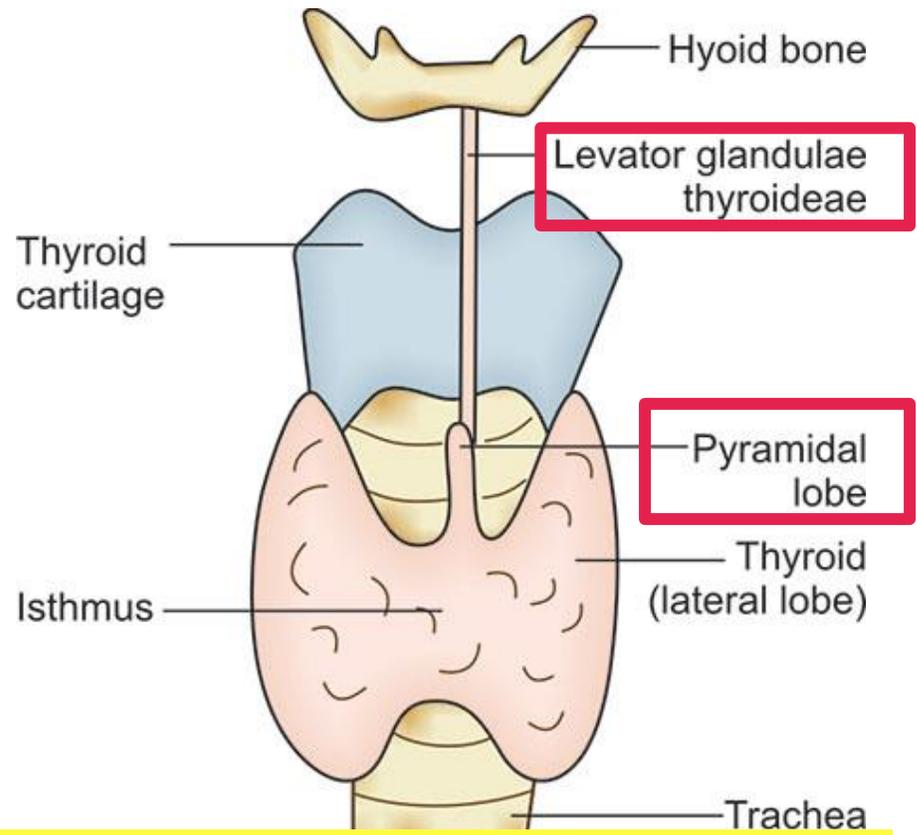
Department of human Anatomy and Embryology
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Mansoura National University, Egypt

M N U



Thyroid gland

Structure of thyroid gland:



Identify ?
Extension of isthmus & thyroid lobe ?

Thyroid gland

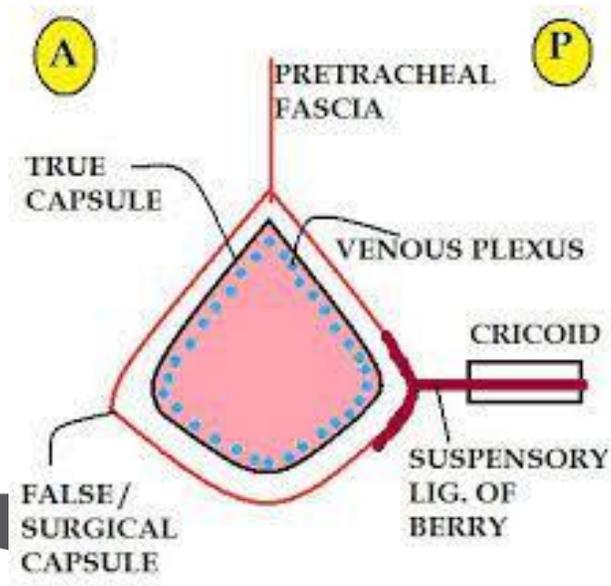
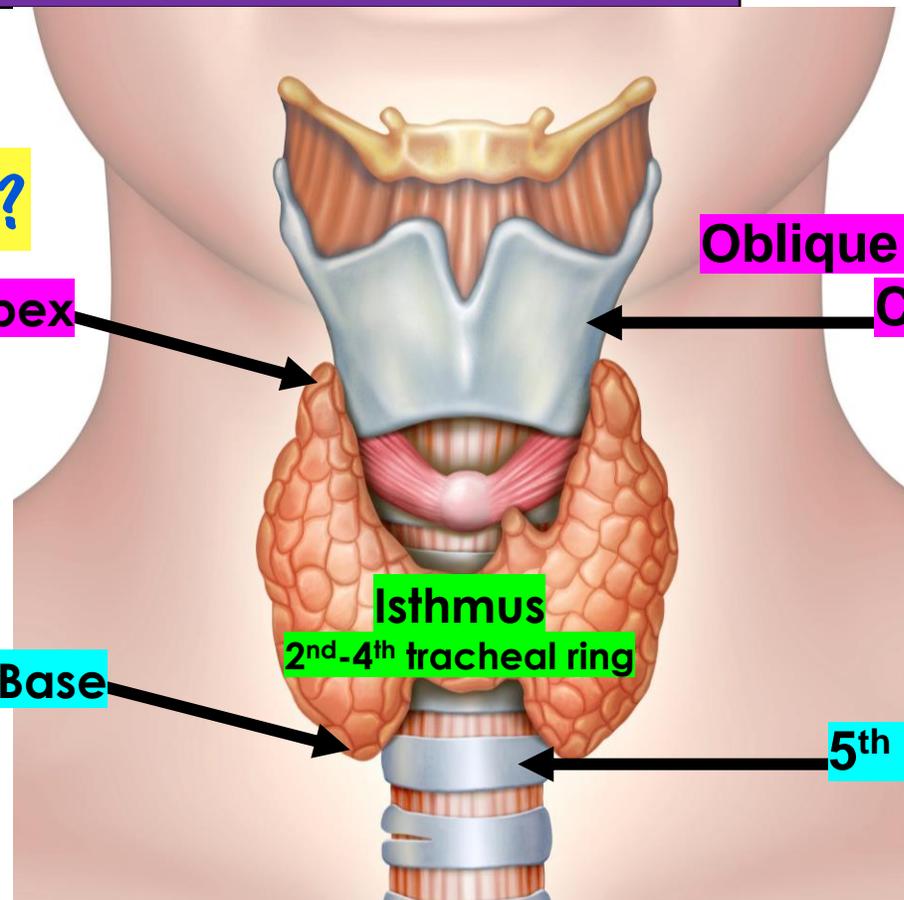
Shape & size of thyroid gland:

- Butterfly in shape
- 25 grams.

Extention?

Site & Extension of thyroid gland:

Capsules of thyroid gland:



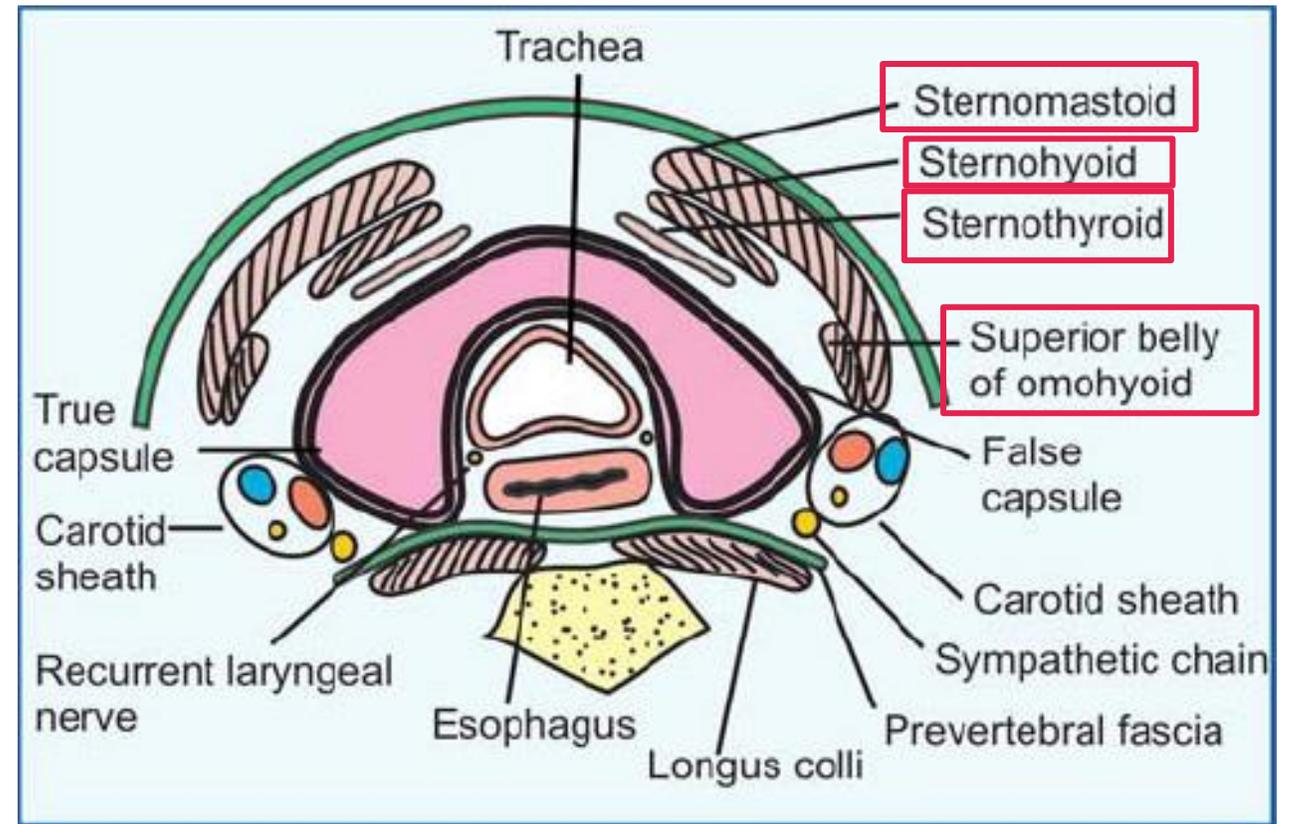
Identify ?
Extension of isthmus & thyroid lobe ?

Thyroid gland

Relations of **Anterolateral surface** of thyroid gland:

Enumerate 2 ms related ?

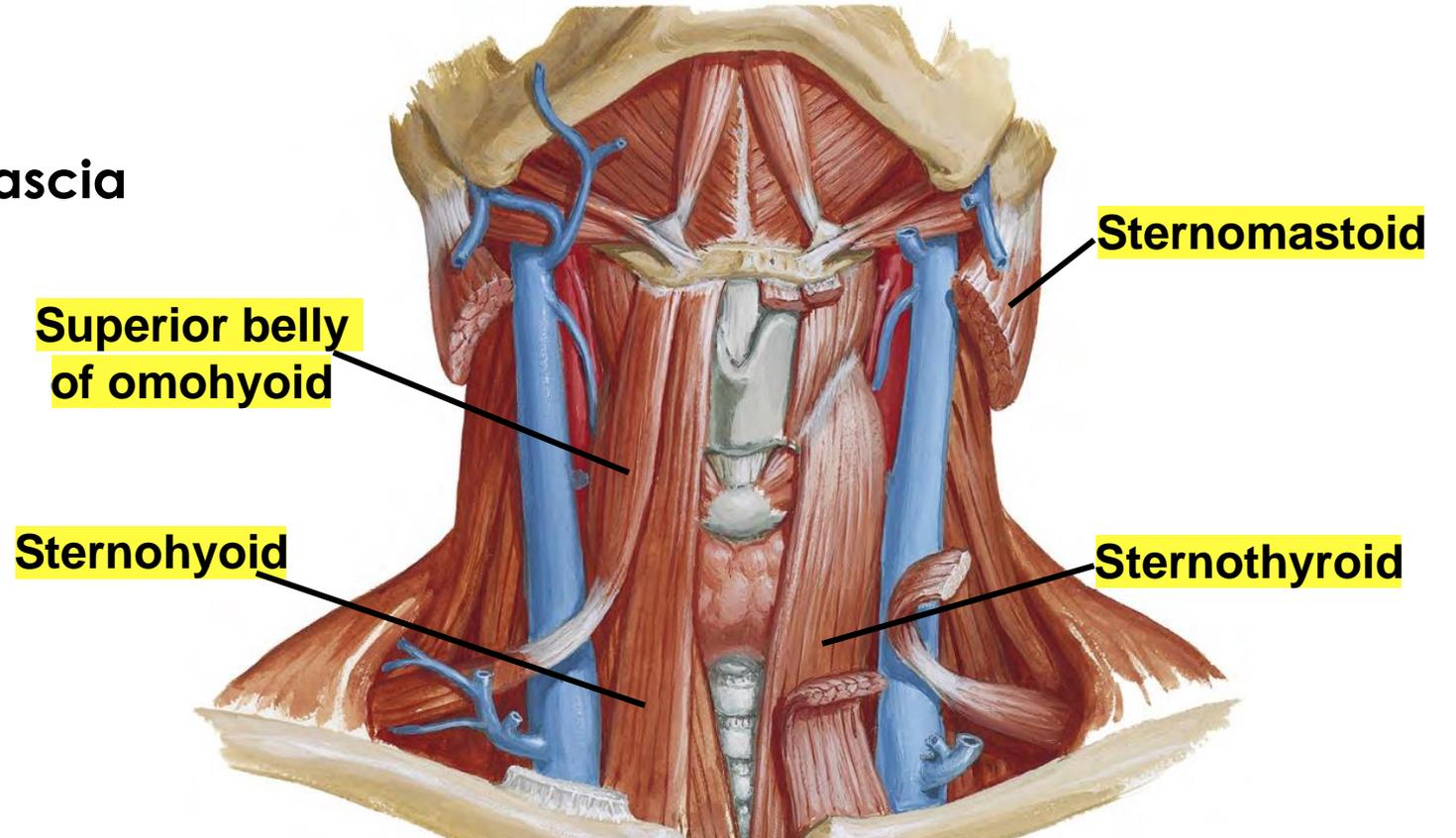
- 1) **S**kin, superficial fascia and deep fascia
- 2) **S**uperior belly of omohyoid.
- 3) **S**ternohyoid, **s**ternothyroid.
- 4) **S**ternomastoid.



Thyroid gland

Relations of Anterolateral surface of thyroid gland:

- 1) Skin, superficial fascia and deep fascia
- 2) Superior belly of omohyoid.
- 3) Sternohyoid, sternothyroid.
- 4) Sternomastoid.

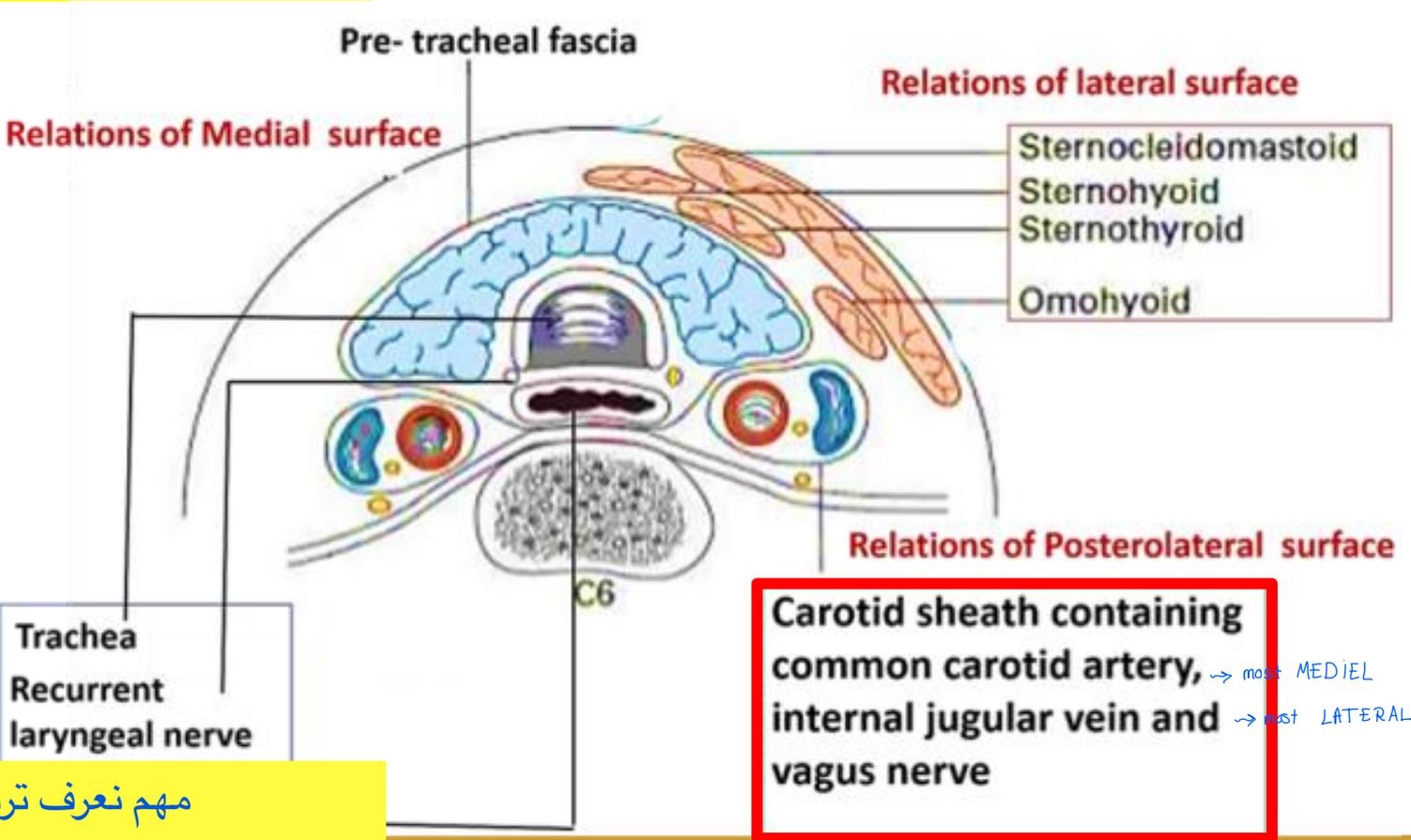
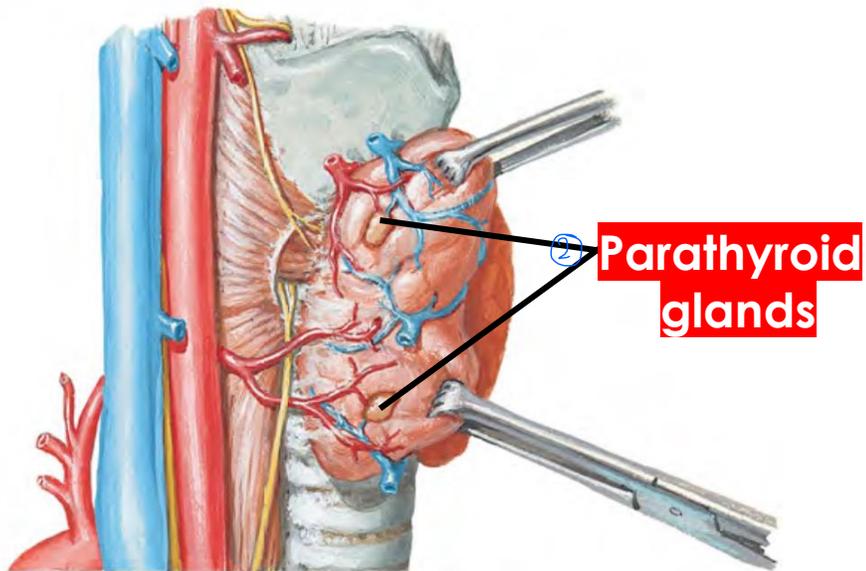


يشاور على جزء من الthyroid سواء الlobe أو الisthmus ويسألك enumerate the related structure

Thyroid gland

Relations of Posterior surface of thyroid gland:

① Carotid sheath ←



- From medial to lateral in carotid sheath : مهم نعرف ترتيبهم
- Common carotid artery then vagus nerve then internal jugular vein
- Parathyroid gland

Thyroid gland

Upper part

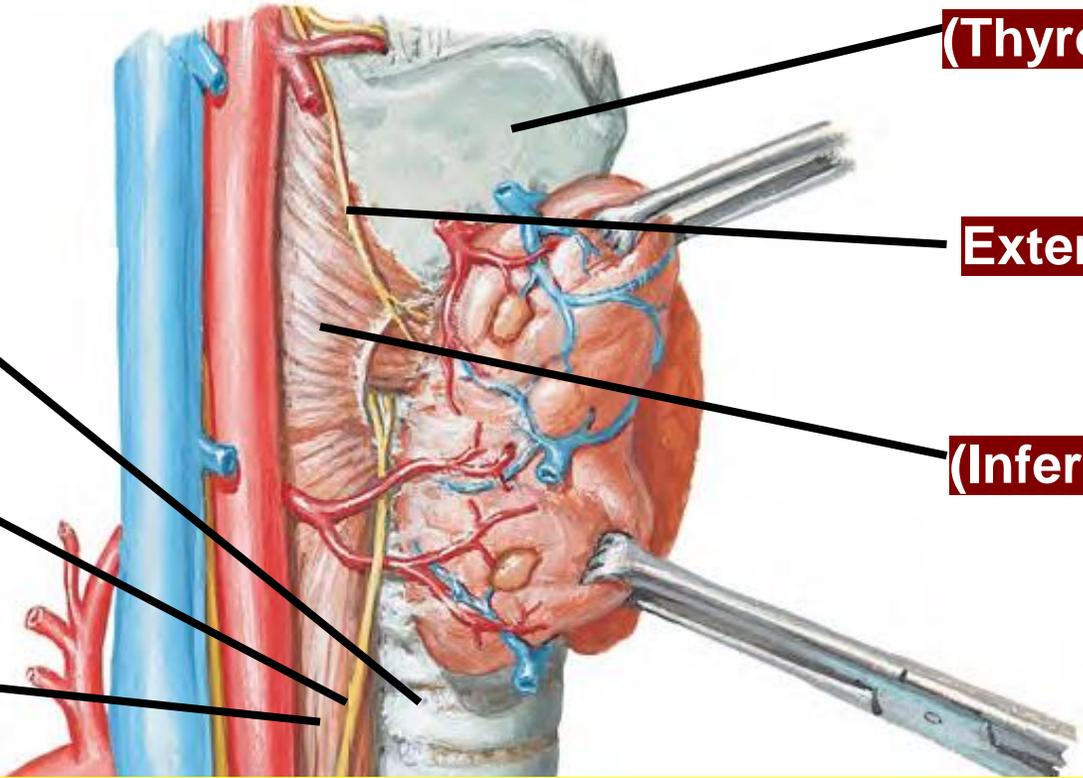
Larynx

(Thyroid cartilage)

External laryngeal nerve

Pharynx

(Inferior constrictor)



Trachea

Recurrent laryngeal nerve

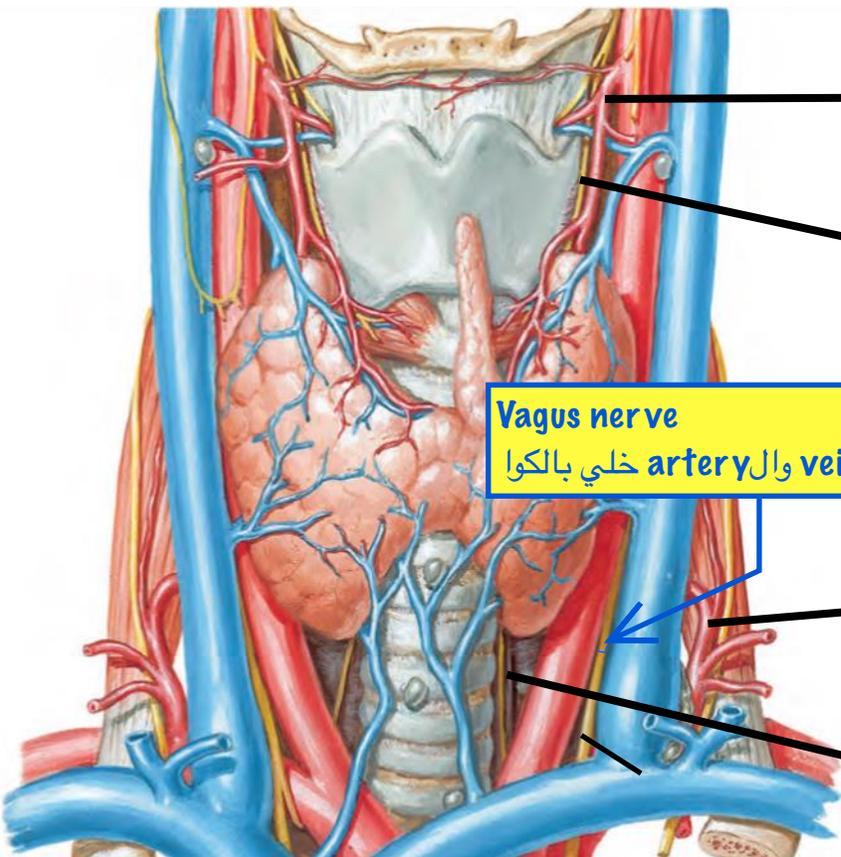
Esophagus

Lower part

سهم يشار على ال upper part أو ال lower part ويسألك
- Related nerve ?

Thyroid gland

Arterial supply of thyroid gland:



Superior thyroid artery

↳ Origin: External carotid A

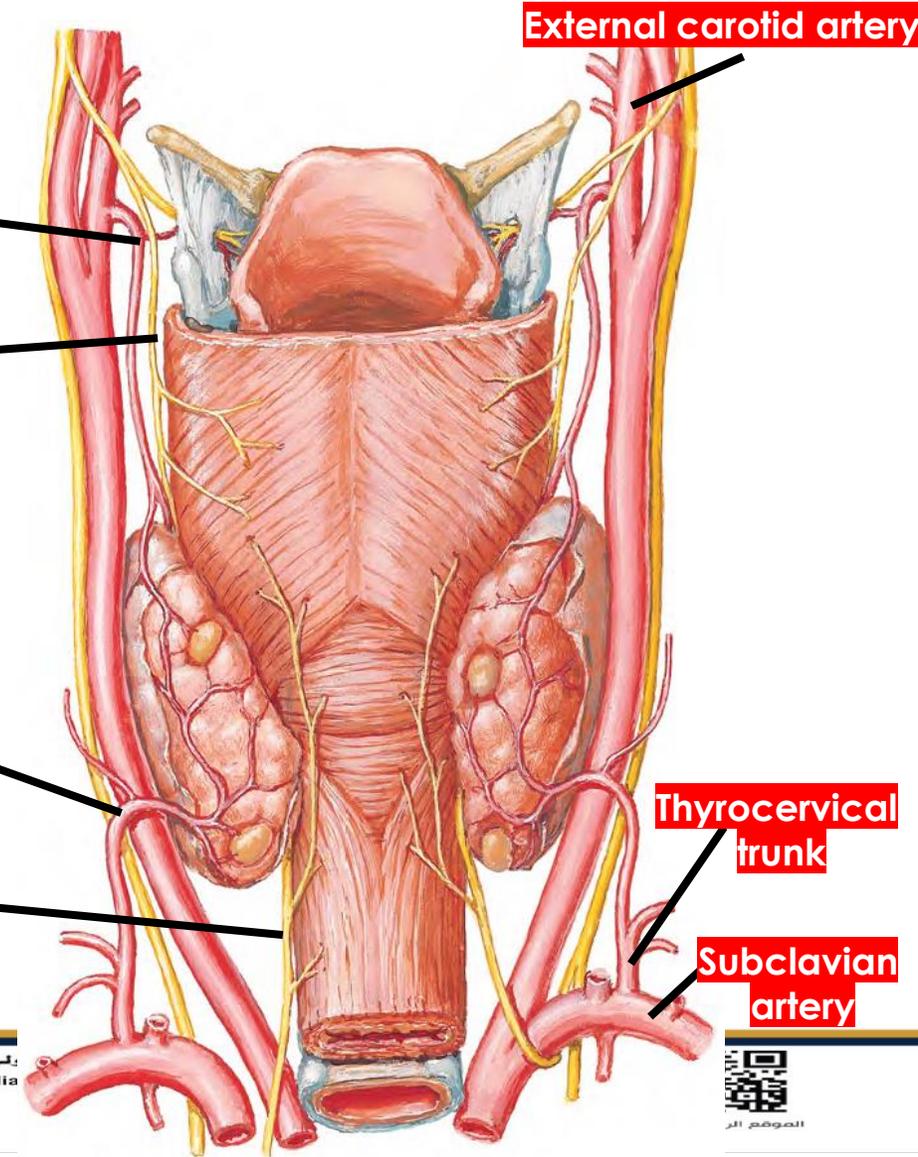
External laryngeal nerve

Vagus nerve
بيكون بين ال vein وال artery خلي بالكوا

Inferior thyroid artery

↳ Origin: thyrocervical trunk which originate from 1st part of subclavian

Recurrent laryngeal nerve



External carotid artery

Thyrocervical trunk

Subclavian artery

**OSPE : Identify this artery & it's origin ?
Enumerate its distribution ?**



1. Superior thyroid artery

The Superior Thyroid Artery

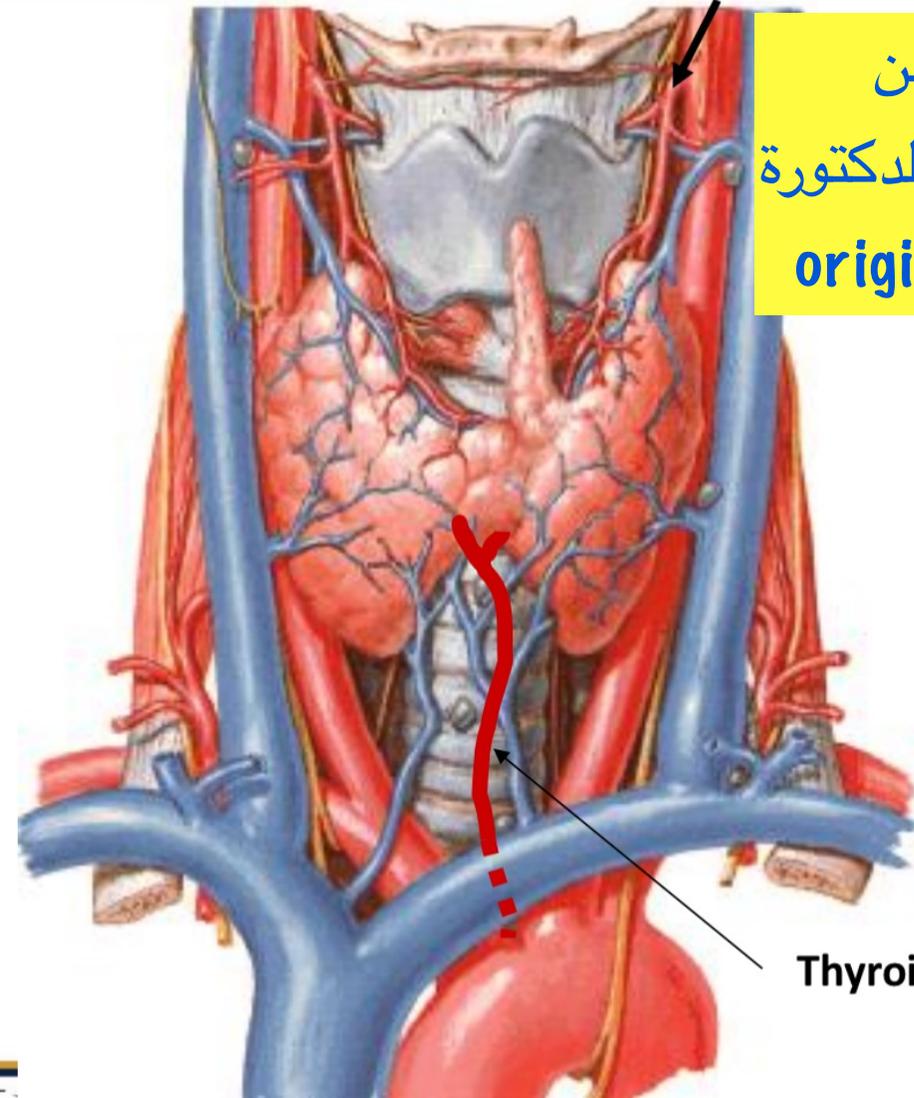
Origin: external carotid artery.

Course: accompanied with external laryngeal nerve

Termination: it ends in the apex by dividing into:

Anterior branch that anastomoses with its fellow of the opposite side.

Posterior branch that anastomoses with inferior thyroid artery.



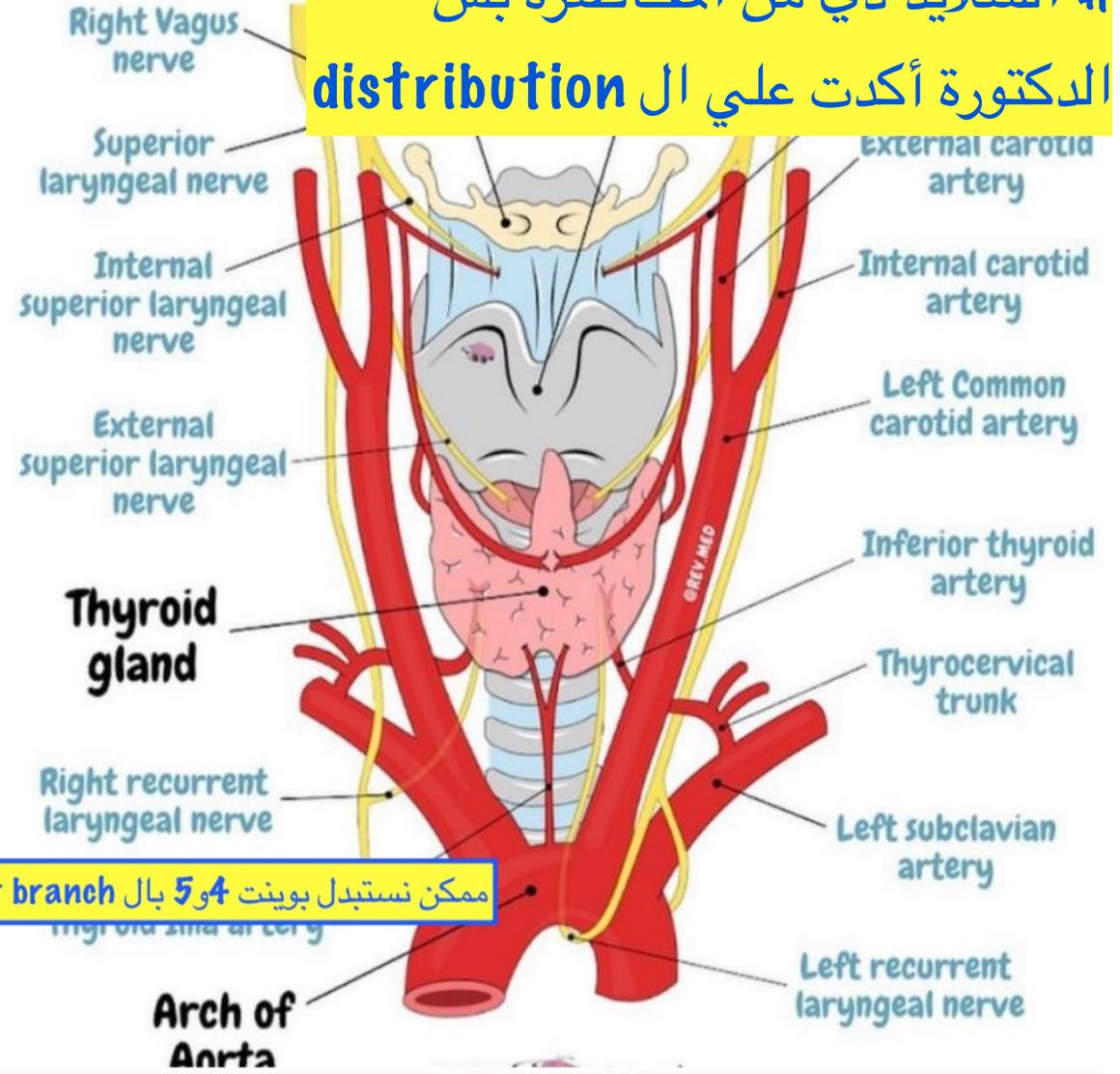
السلايد دي من
المحاضرة بس الدكتور
أكدت علي ال origin

Thyroid ima artery

السلايد دي من المحاضرة بس الدكتورة أكدت علي ال distribution

Branches of thyroid artery:

1. **Glandular branches**: to the **apex** & **upper 1/3** of the thyroid lobe and **upper 1/2** of the isthmus.
2. **Superior laryngeal artery**: pierces the thyrohyoid membrane.
3. **Infrathyoid artery**.
4. Artery to sternomastoid muscle.
5. Artery to cricothyroid muscle.



ممكن نستبدل بويونت 4 و 5 بال muscular branch



2. Inferior thyroid artery

Origin: thyrocervical trunk from 1st part of subclavian artery.

Course: accompanied with recurrent laryngeal nerve is related to it close to the gland.

Branches: ← لوحاب تكتب muscular اكتبها عادي

1. **Glandular branches:** to the base & lower 2/3 of the thyroid lobe and lower 1/2 of the isthmus.

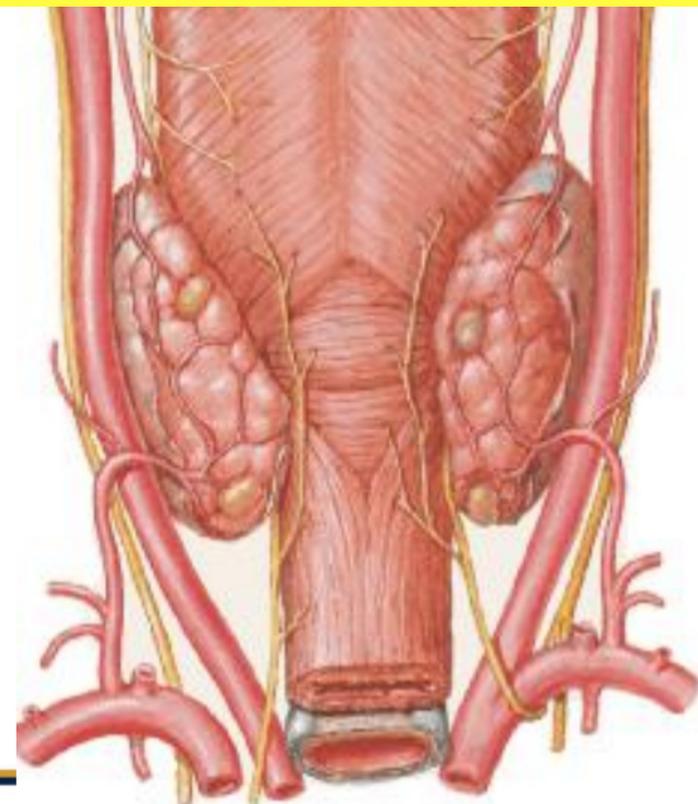
2. **Parathyroid glands** ← May be supplied by superior also but mainly inferior

3. **Inferior laryngeal artery.**

4. Tracheal and esophageal branches.

5. Ascending cervical artery: anterior to scalenus anterior.

السلايد دي من المحاضرة بس
الدكتورة أكدت علي ال
origin وال distribution



3. Thyroid ima artery:

- ❑ It may be present.
- ❑ **Origin:** it arises either from the arch of aorta or from the brachiocephalic artery.
- ❑ Ascends in front of the trachea to supply the isthmus.
- ❑ It is a potential source of bleeding when performing procedures in the midline of the neck inferior to the isthmus.

#السلامة دي من
المحاضرة بس الدكتور
أكدت عليها

NB: Accessory thyroid arteries: From the esophageal and tracheal branches.



Thyroid gland

Venous drainage of thyroid gland:

Superior thyroid vein

Middle thyroid vein

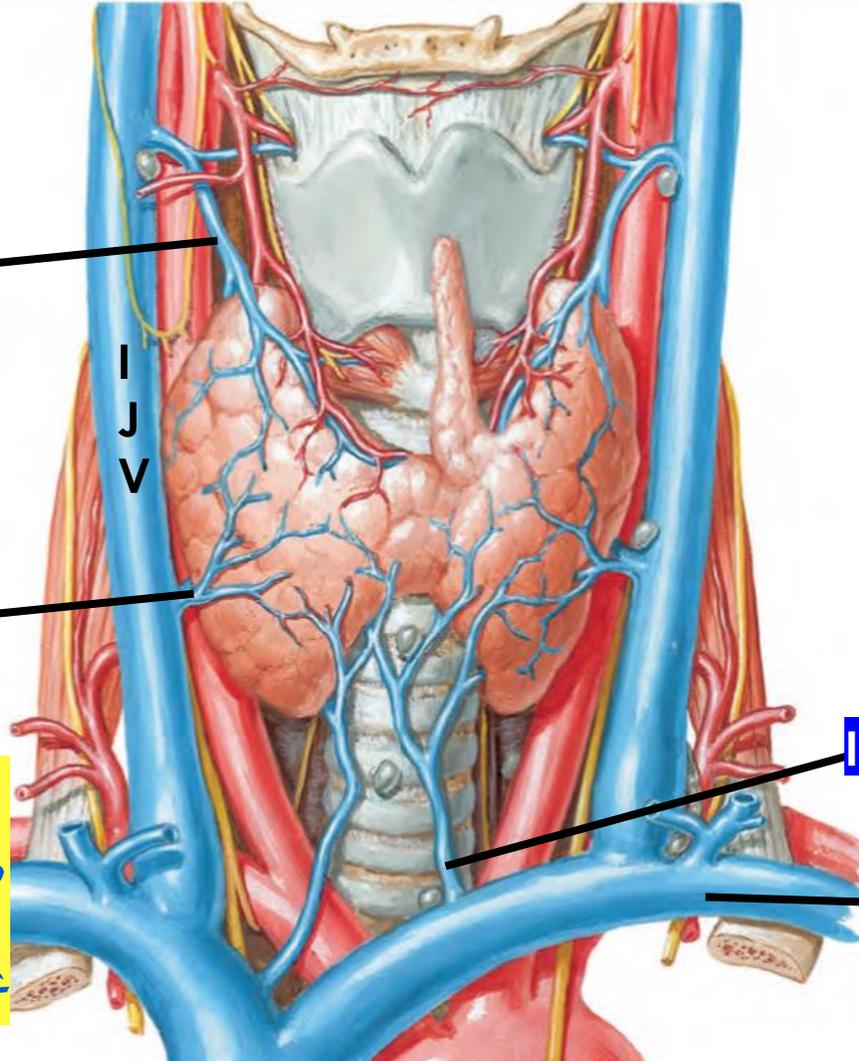
Inferior thyroid vein

Brachiocephalic vein

OSPE :

Identify this vessel ? Termination ?

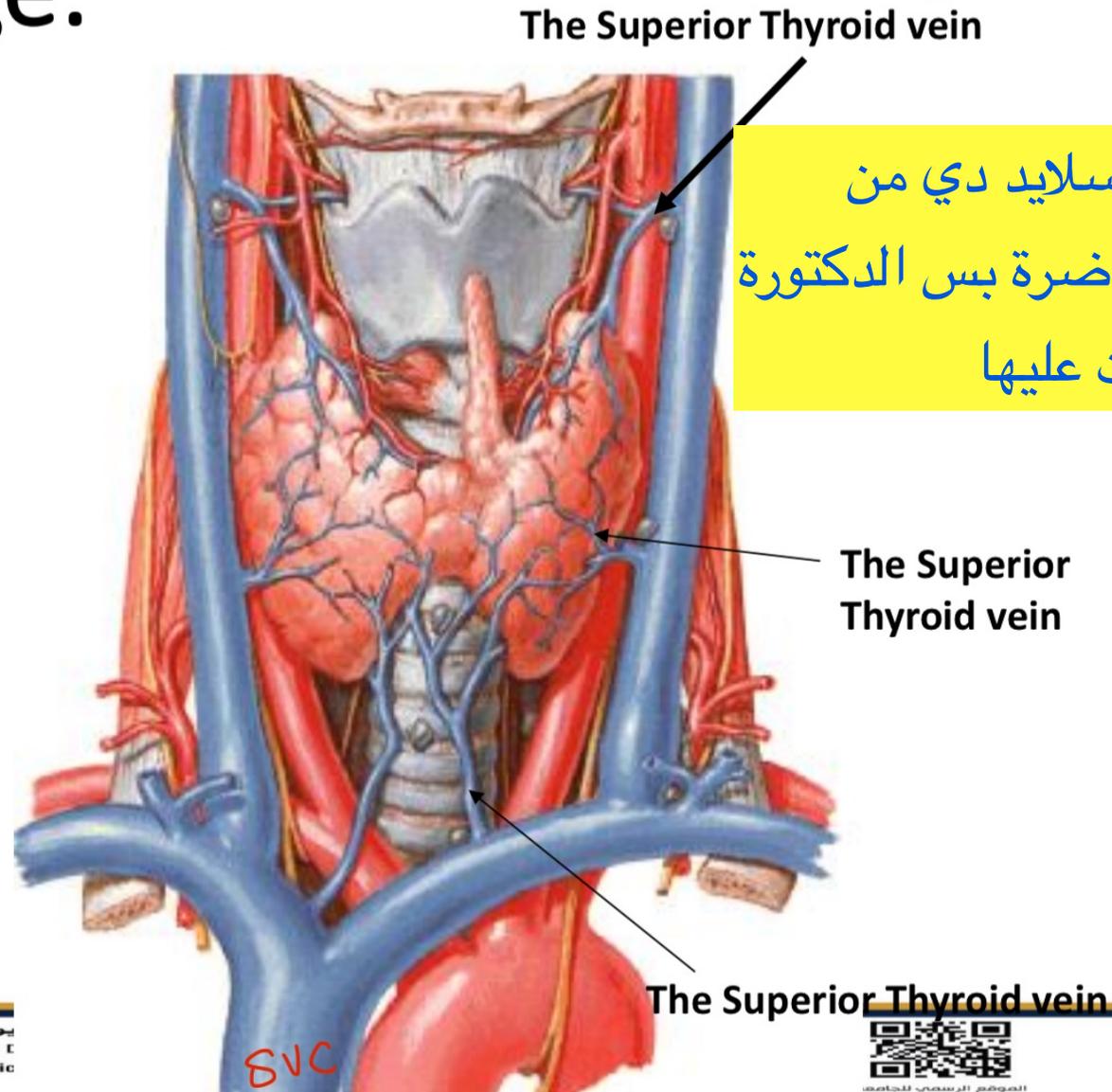
عادي ما نحددش دا RT ولا Lt



Thyroid Gland Anterior View

Venous Drainage:

- Superior thyroid vein:** it ends in **internal jugular vein**.
- Middle thyroid vein:** it ends also in **internal jugular vein**.
- Inferior thyroid vein:** it ends in **brachiocephalic vein**.





WITH NOTES

Adrenal gland & Pancreas

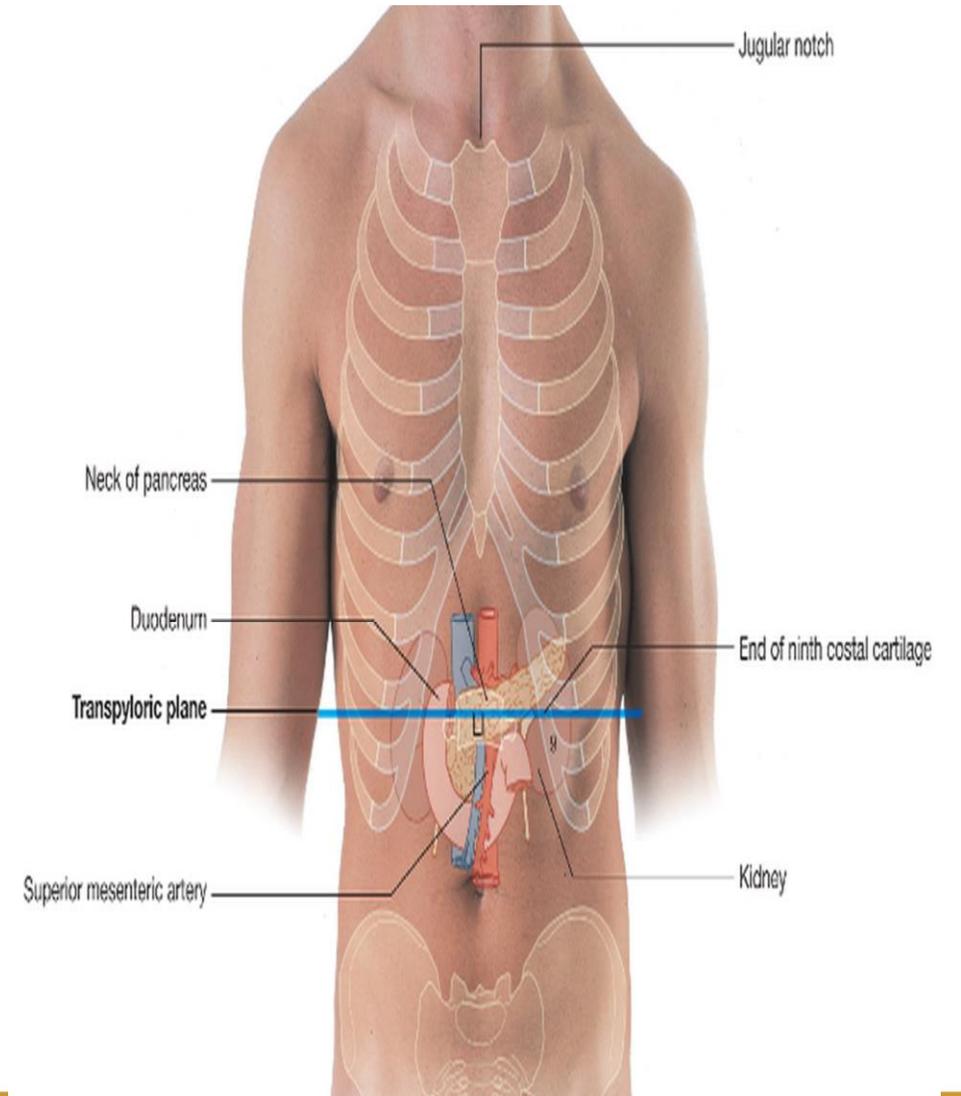
Department of human Anatomy and Embryology
Faculty of Medicine
Mansoura National University, Egypt

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Location of pancreas

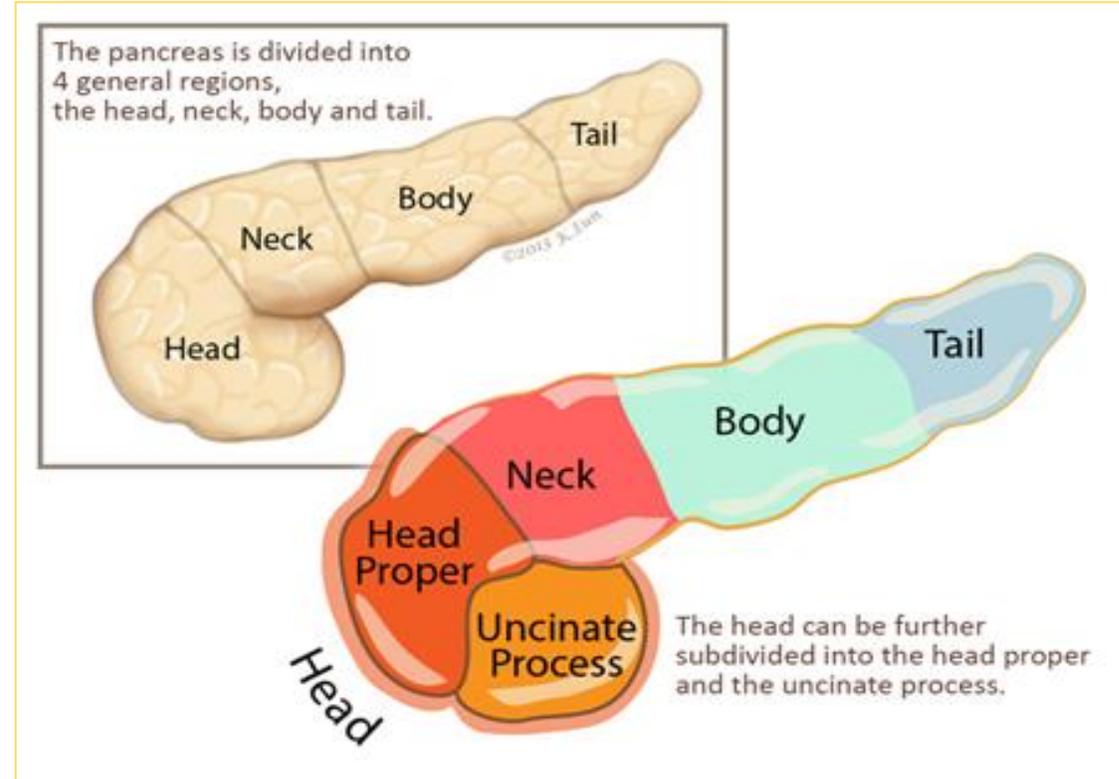
- It lies across the upper part of the posterior abdominal wall behind the peritoneum of the lesser sac. It crosses from the concavity of the duodenum to the hilum of the spleen. (Epigastrium & Left hypochondrium).



OSPE : Site ?

Parts of pancreas

- 1- Head
 - 2- neck
 - 3- Body
 - 4- Tail
- The lower part of the head forms a projection called **uncinate process**.

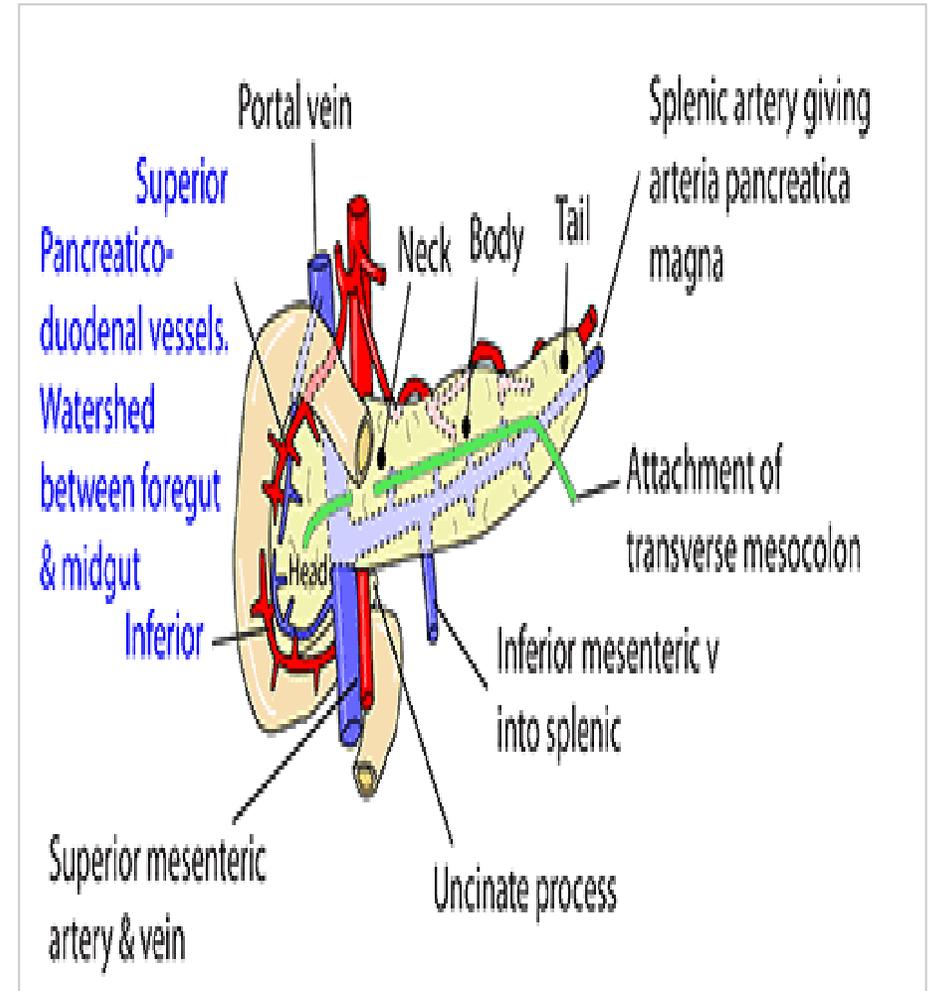


OSPE : Enumerate parts of this organ ?

Relations of pancreas

Head of pancreas:

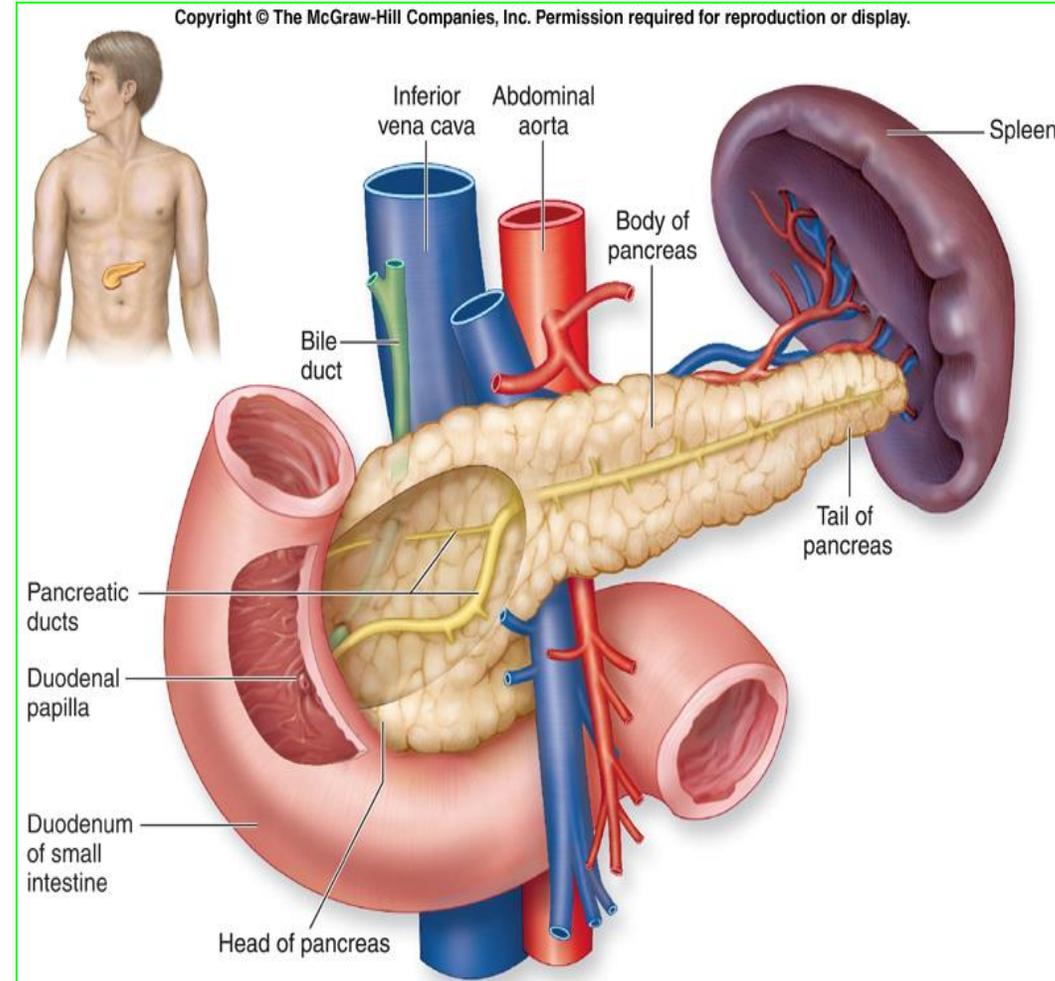
- It lies in the concavity of the duodenum.
- It is related to the 1st part of **duodenum** superiorly, 2nd part on the right side, (separated from it by **sup. & inf. pancreatico -duodenal arteries**) and 3rd part inferiorly.



OSPE : Enumerate relation of this part ?

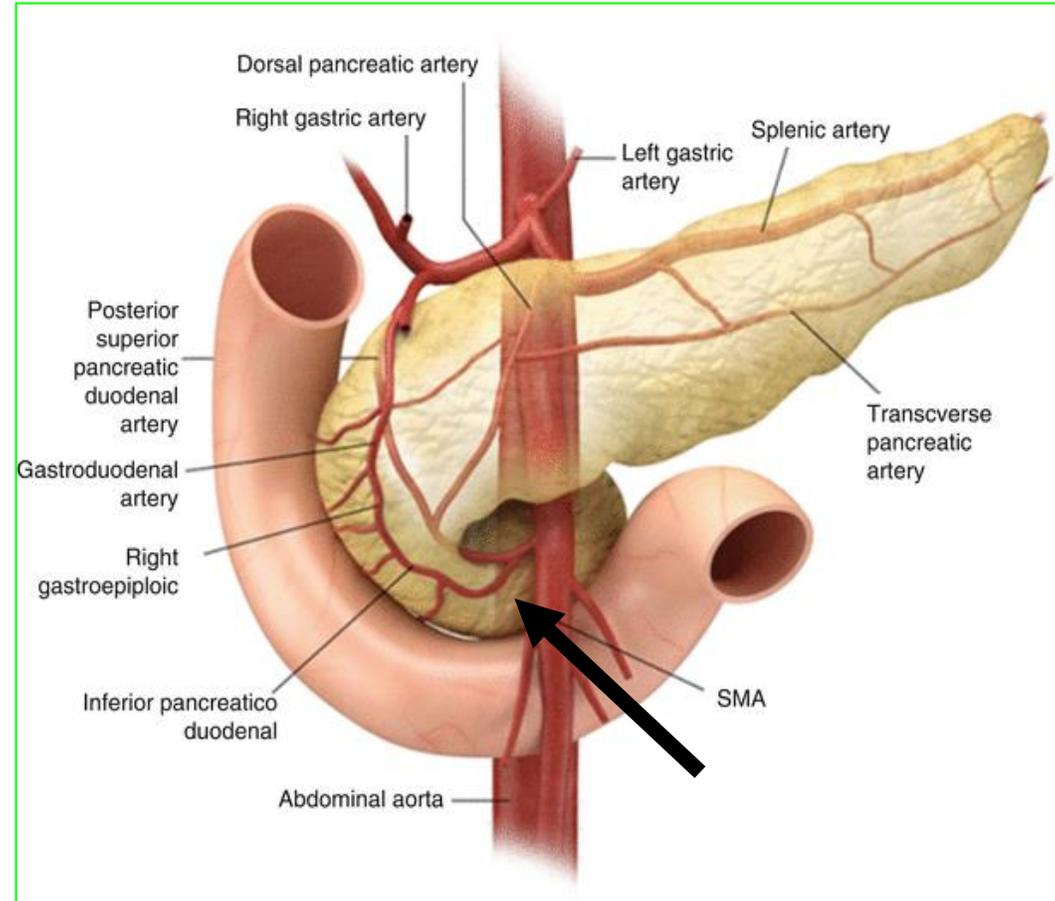
Head of Pancreas

- **Anteriorly** , it is related to transverse colon, jejunum .
- **Posteriorly** , it is related to IVC, and common bile duct.



- **Uncinate process:**

Lies between **abdominal aorta** and **superior mesenteric vessels.**



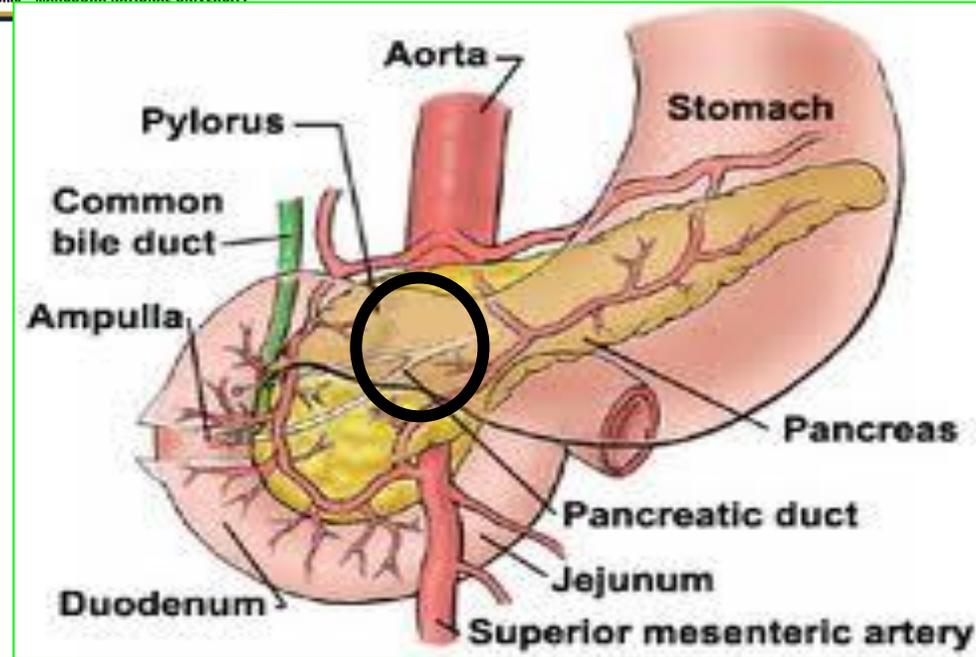
OSPE : Identify ?
Related structure ?

Neck of pancreas:

• Anteriorly:

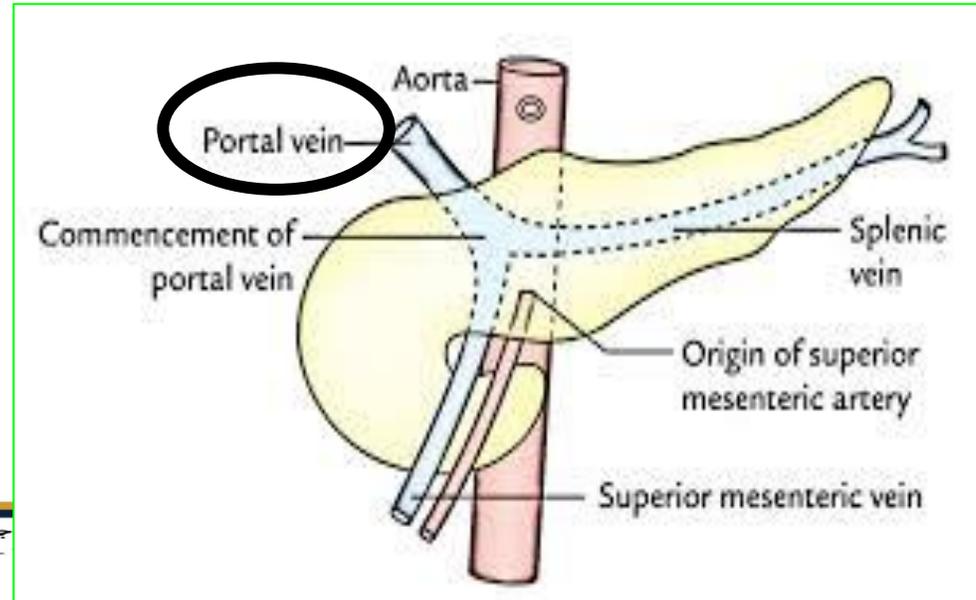
It is related to the **gastro-duodenal junction**.

pyloro-duodenal junction



• Posteriorly:

It is related to the **formation of portal vein** from **splenic and superior mesenteric veins**.



OSPE : Identify ?

Enumerate posterior relation ?

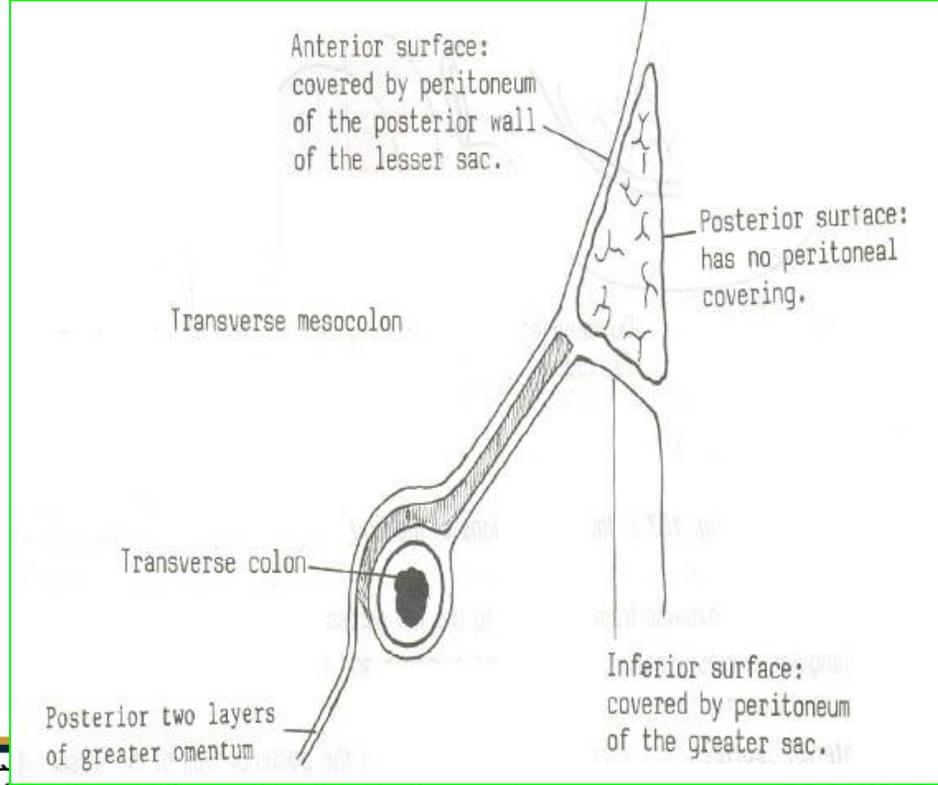
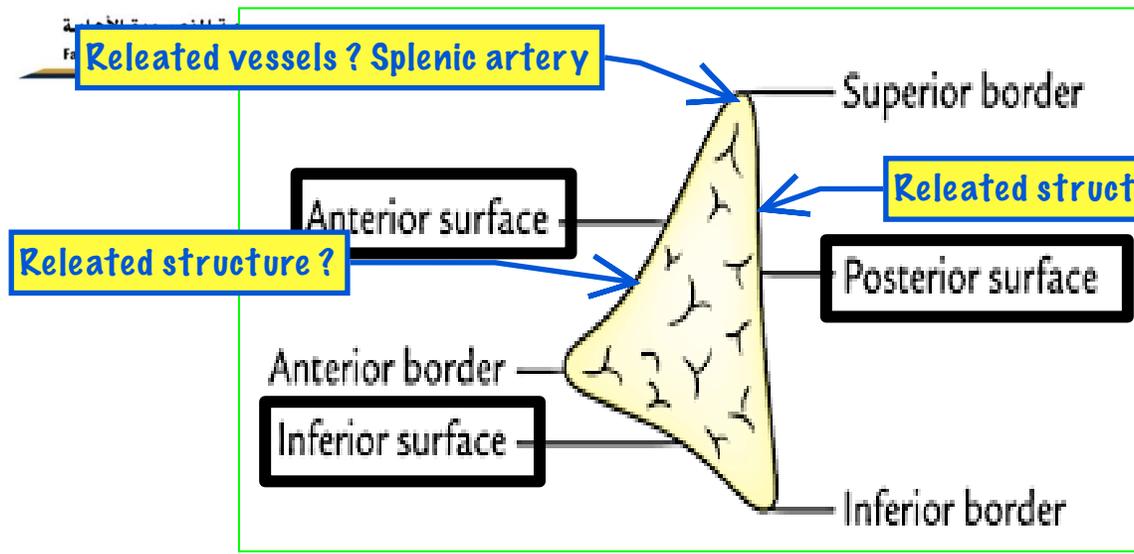
Body of pancreas:

-It has three surfaces:

- Anterior
- Posterior
- Inferior ← الدكتورة قالت سيبيكوا منه ،،سكيب 😊

- And three borders :

- Anterior
- Superior
- Inferior.



Surfaces of body of Pancreas:

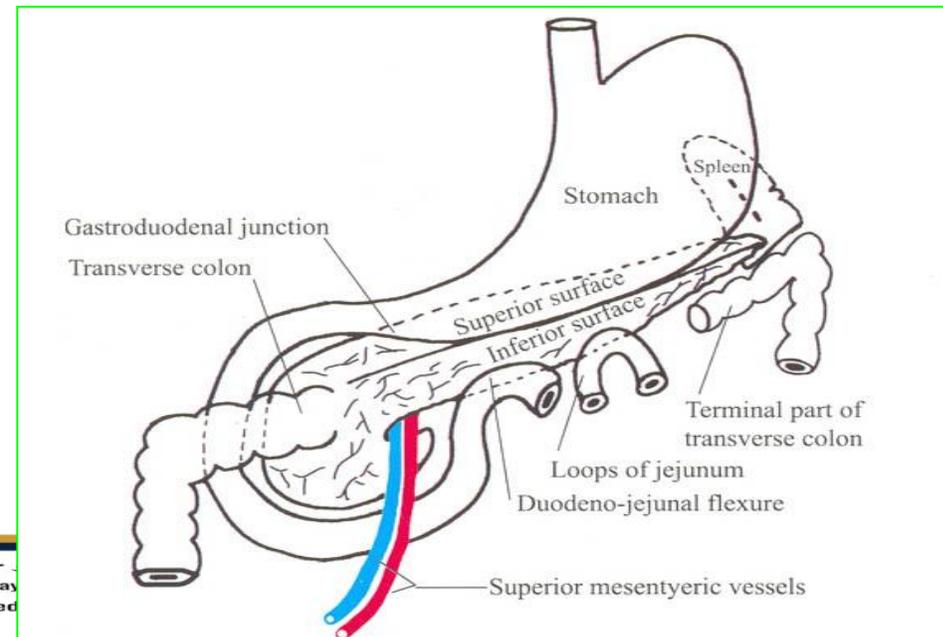
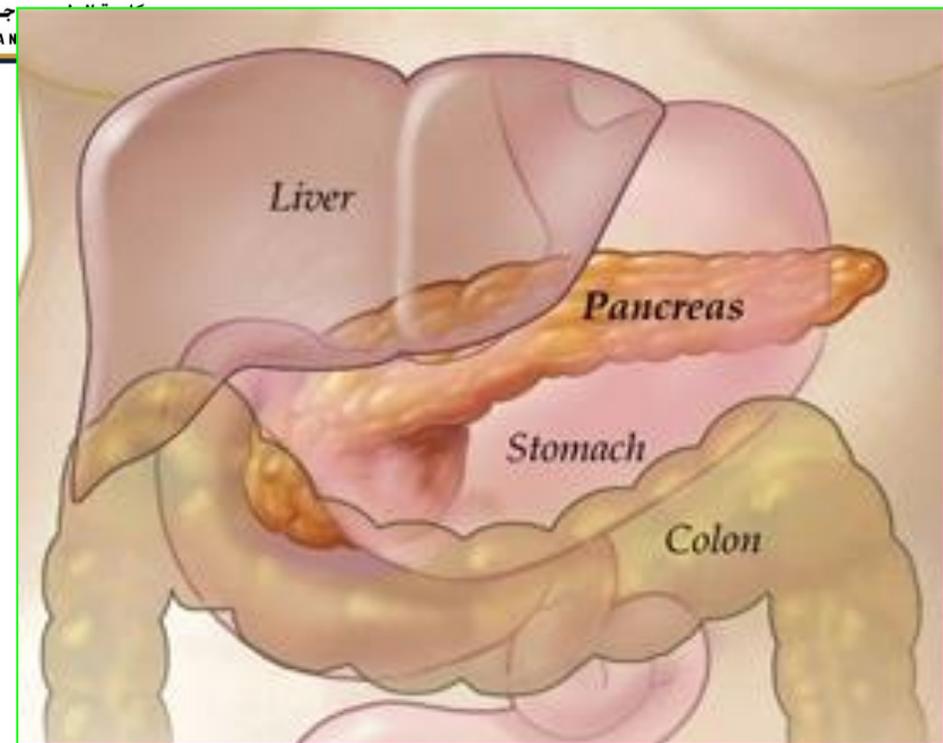
1- Anterior surface:

Related to: **stomach** , separated from it by the **lesser sac**.

2- Inferior surface:

Related to :

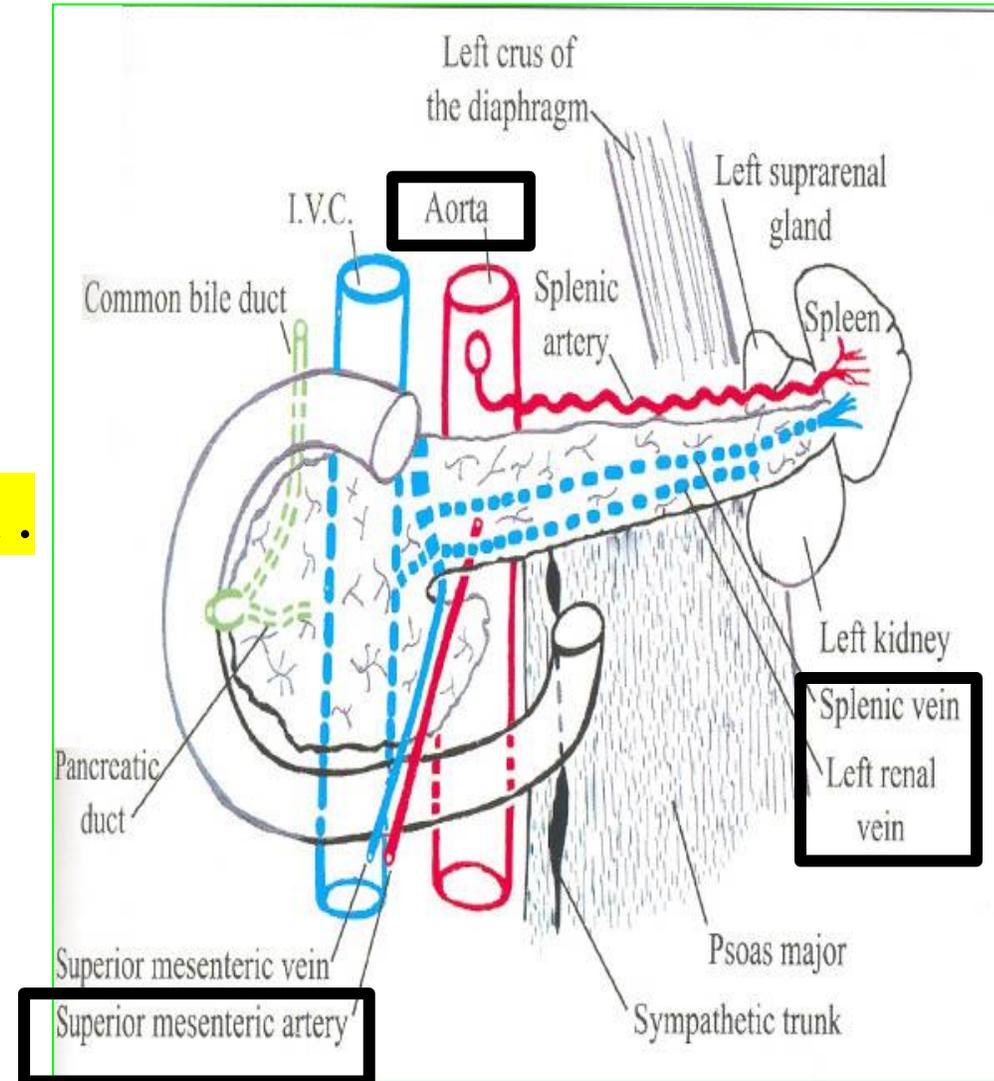
- **Coils of small intestine**
- **transverse colon**



3- Posterior surface: مهم جدا

- It is **not covered by peritoneum** and related to posterior abd. wall:

- 1- Aorta and origin of Sup. Mesenteric A.
- 2- Splenic and left renal vein.



OSPE : Related veins ?

Splenic and Lt renal vein

Only surface not covered by peritoneum

Borders of the body:

1- Superior border:

It is related to splenic artery.

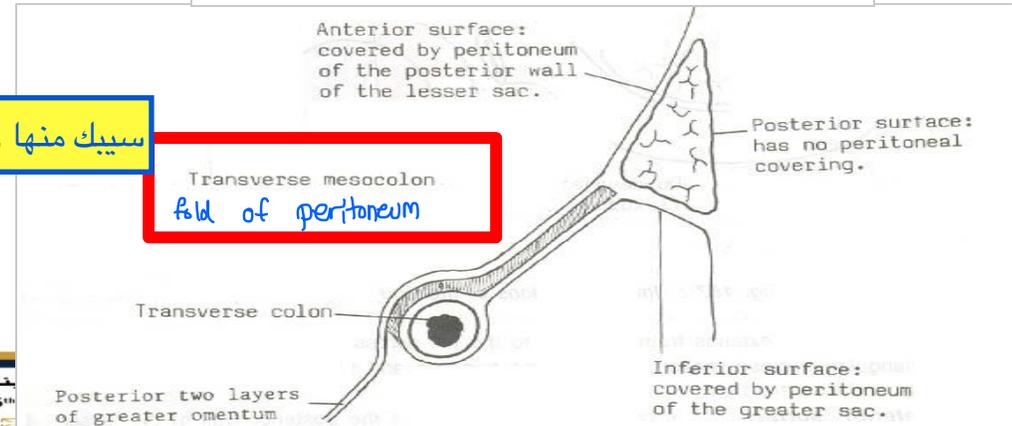
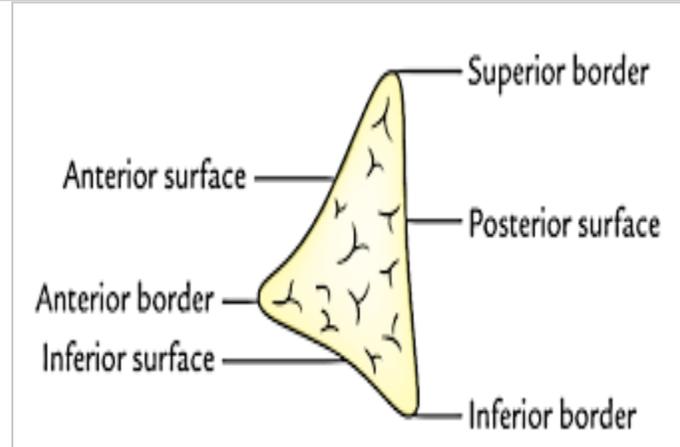
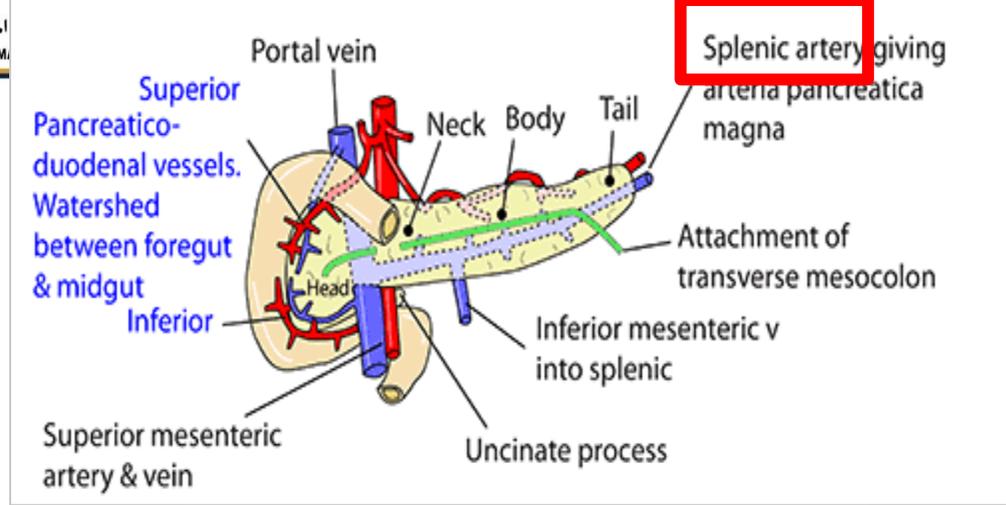
2- Anterior border:

It gives attachment to transverse mesocolon and greater omentum.

3- Inferior border (posterior):

Same relations as posterior surface.

سيك منها .. سكيب 😊

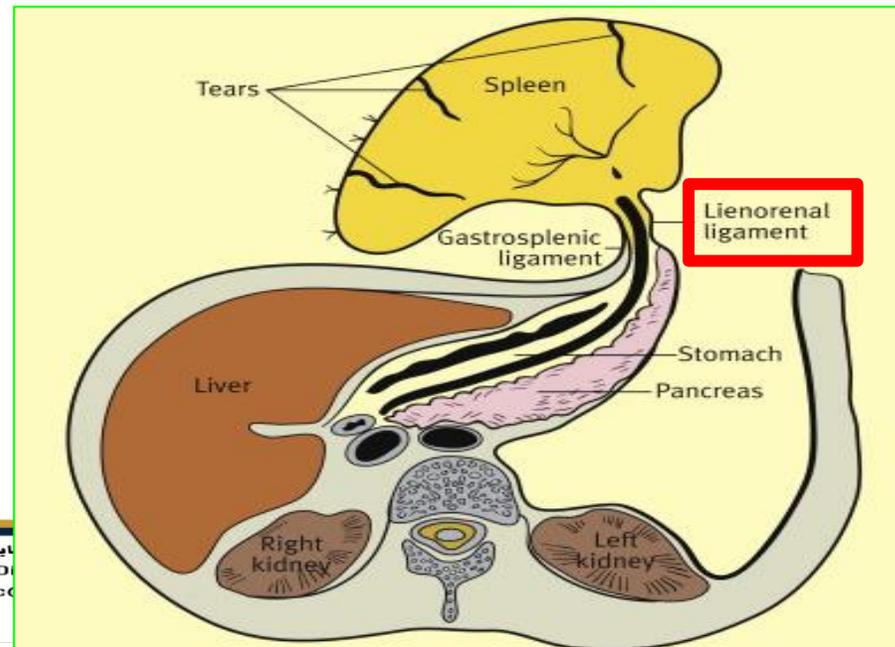
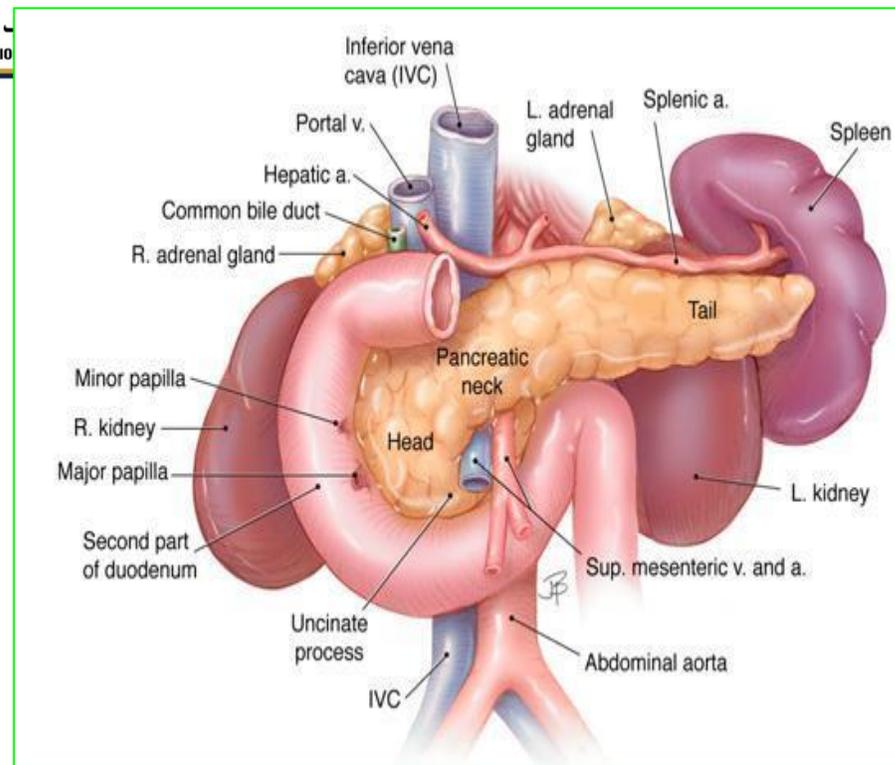


Tail of pancreas:

1- It is related to the visceral surface of spleen near its hilum.

2- It reaches the hilum via the **lienorenal ligament**.

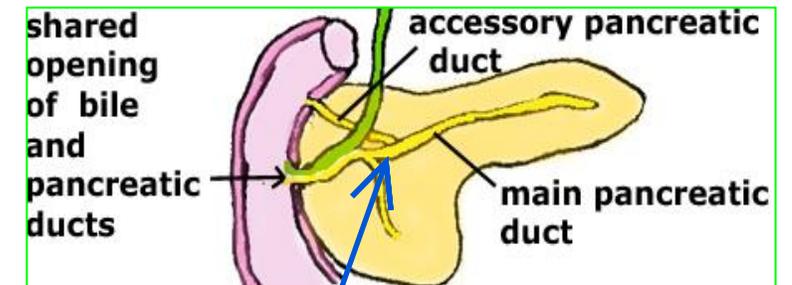
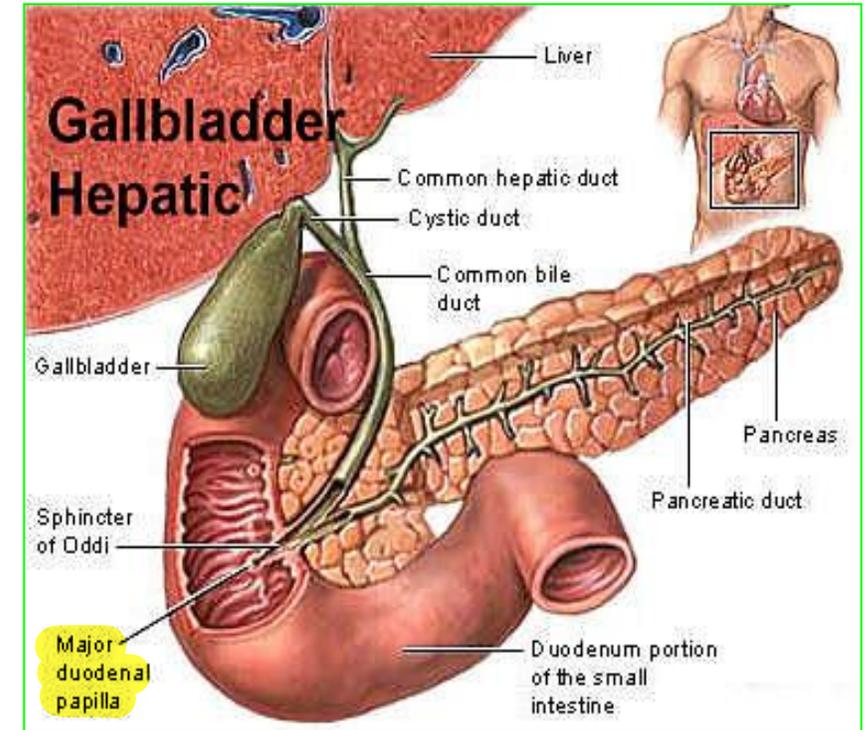
OSPE : Related ligament ?



Ducts of pancreas

1- Main pancreatic duct:

- Main duct runs the entire length of pancreas beginning from the tail.
- It receives many tributaries from tail, body, neck, inferior portion of head & uncinete process.
- Joins **common bile duct** & together they open into a small hepatopancreatic ampulla (**Ampulla of Vater**) opens in the 2nd part of duodenum (postero-medial).
- The ampulla opens into the lumen of the duodenum by means of a small Papilla, (**Major duodenal papilla**).



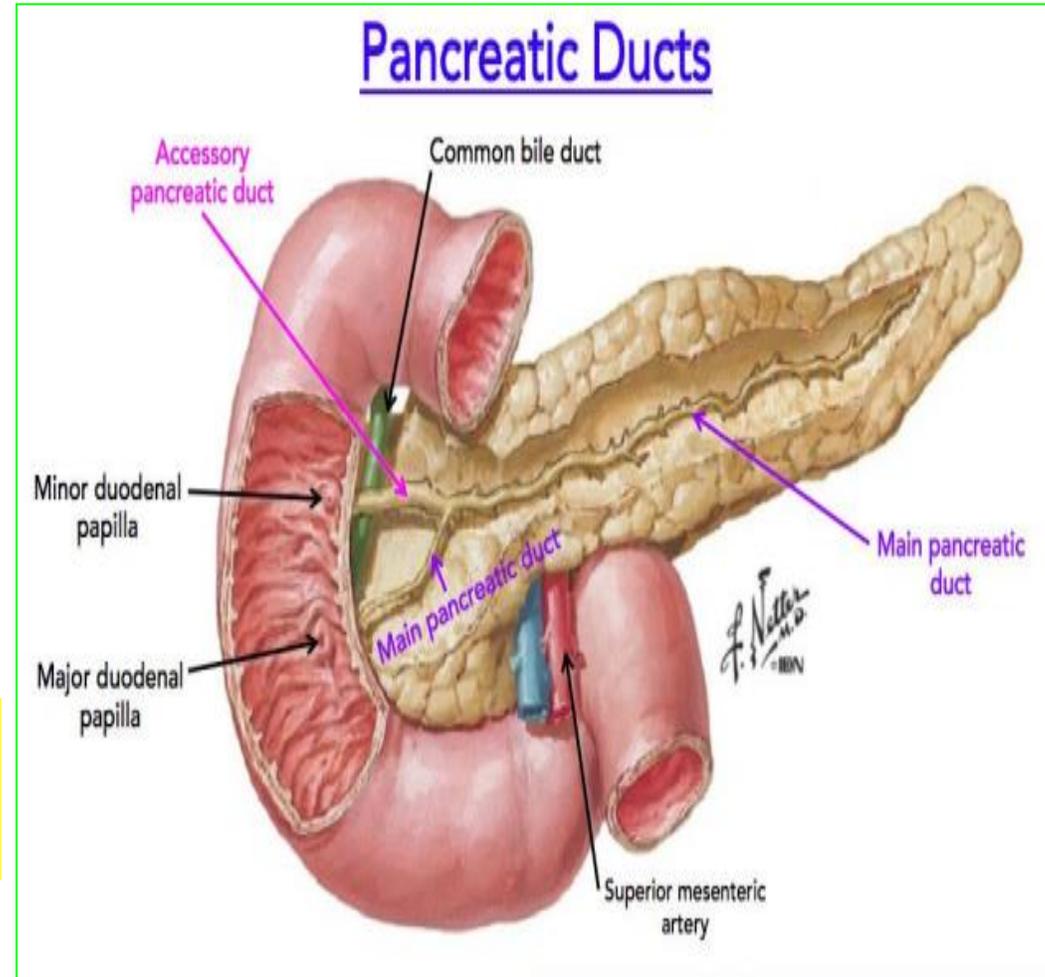
Level of termination ?

- Embryological origin : Distal part of dorsal pancreatic duct + Whole ventral duct

2- Accessory pancreatic duct:

- Accessory duct drains superior portion of the head.
- It empties separately into 2nd part of duodenum at (minor duodenal papilla) above the ampulla of Vater.

- Embryological origin : Proximal part of dorsal pancreatic duct



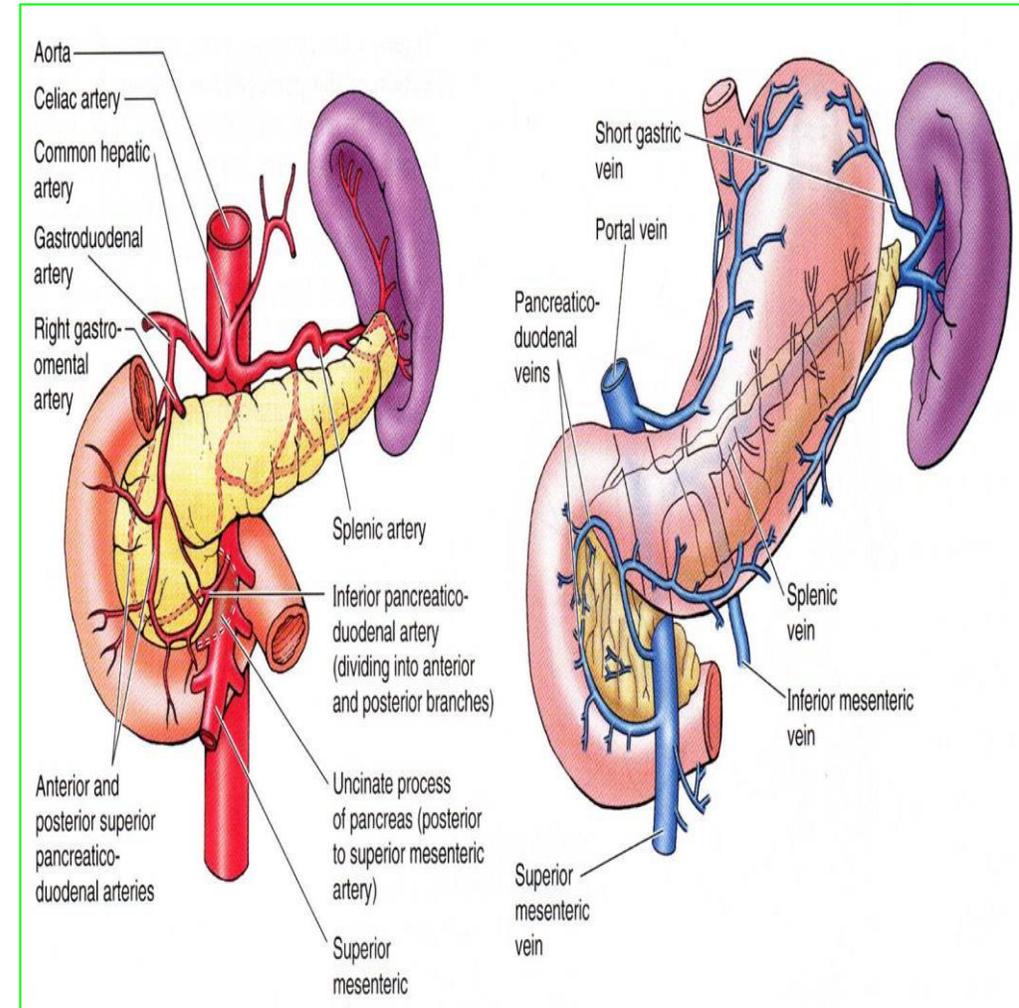
Blood supply

• Arterial supply:

- 1- Superior, inferior pancreaticoduodenal arteries: to the head.
- 2- Pancreatic branches of splenic artery: to the rest of pancreas.

• Venous drainage:

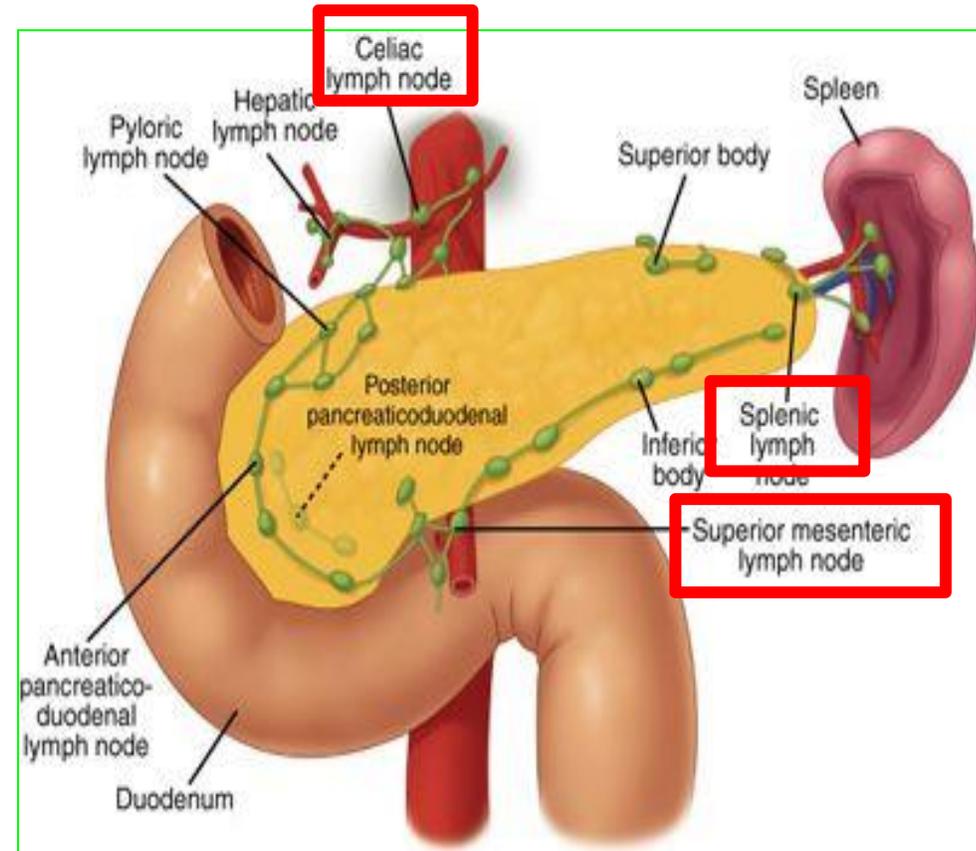
- Superior & Inferior pancreaticoduodenal veins
- To splenic vein and portal vein.



OSPE : Enumerate 2 arterial supply , Venous drainage of this organ ?

Lymphatic drainage

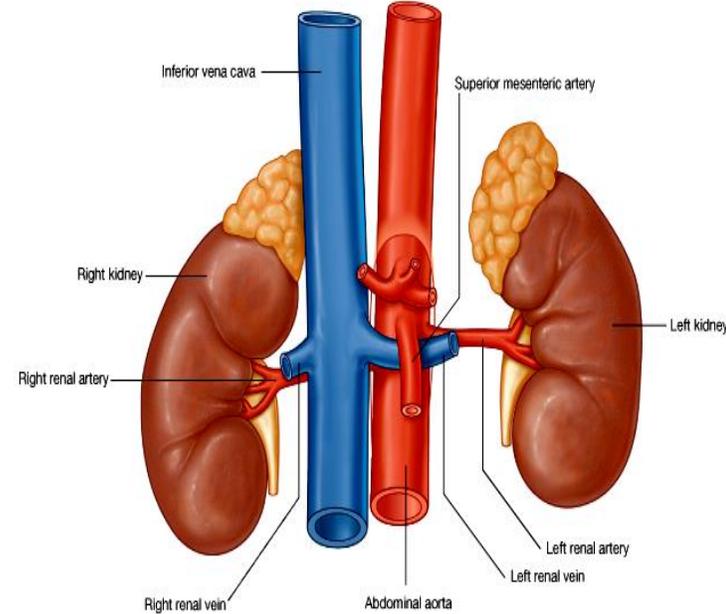
- 1- Upper part of head → **coeliac** lymph nodes.
- 2- Lower part of head → **superior mesenteric** lymph nodes.
- 3- Rest of pancreas → **pancreaticosplenic** lymph nodes.



Adrenal glands

The suprarenal (adrenal) glands:

- ✓ **Structure:** consists of an outer cortex and an inner medulla
- ✓ **Position:** over the upper pole of the kidney one on each side of the midline.
- ✓ **Coverings:** enclosed together with the kidney in the renal fascia and perirenal fat, separated from the kidney by a septum of fibroareolar tissue.
- ✓ **Nerves:** ← 😊 سكيب
 - The medulla: supplied by preganglionic sympathetic fibers which end on the chromaffin cells of the medulla.
 - The cortex: under hormonal control of ACTH.



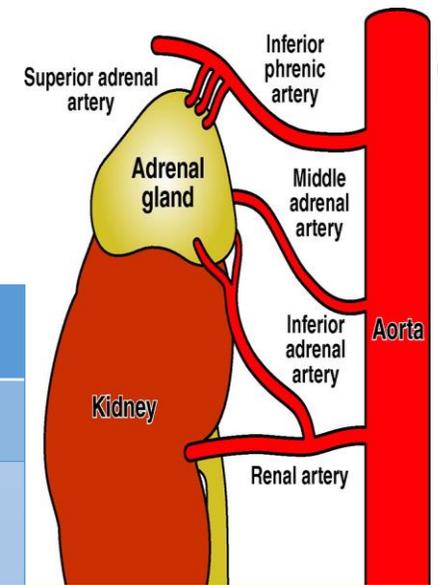
OSPE :
Identify ?
Enumerate its covering ?

مهم نحدد Rt ولا Lt
* لو مثلثة وناحية ال vein هتكون Rt
* لو هلالية وناحية ال artery هتكون Lt

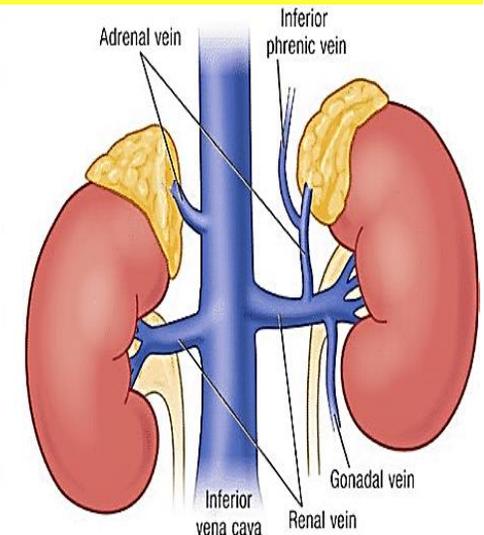


OSPE : Enumerate its arterial supply & it's origin ?

مهم تكون عارف هوا مشاور على اليمين ولا الشمال ؟
Venous drainage ?



ويمكن يجيب الصورة دي ويشاور على vessels
ويقولك identify this artery and origin



	Right suprarenal gland	Left suprarenal gland
Shape	pyramidal	semilunar
Anterior relations	<ul style="list-style-type: none"> ➤ IVC. ➤ Bare area of the liver. 	<ul style="list-style-type: none"> ➤ lesser sac (stomach bed) ➤ stomach.
Posterior relations	<ul style="list-style-type: none"> ➤ Right crus of diaphragm ➤ Right kidney. 	<ul style="list-style-type: none"> ➤ Left crus of diaphragm ➤ Left kidney.
Hilum	Directed upwards	Directed downwards
Suprarenal arteries	<p>Superior suprarenal artery: from inferior phrenic artery. Middle suprarenal artery: from abdominal aorta Inferior suprarenal artery: from the renal artery.</p>	
Suprarenal veins	ends in the inferior vena cava.	ends in the left renal vein.



WITH NOTES

Pelvic Wall

BY: Dina Badawi

Department of human Anatomy and Embryology
Faculty of Medicine
Mansoura National University, Egypt

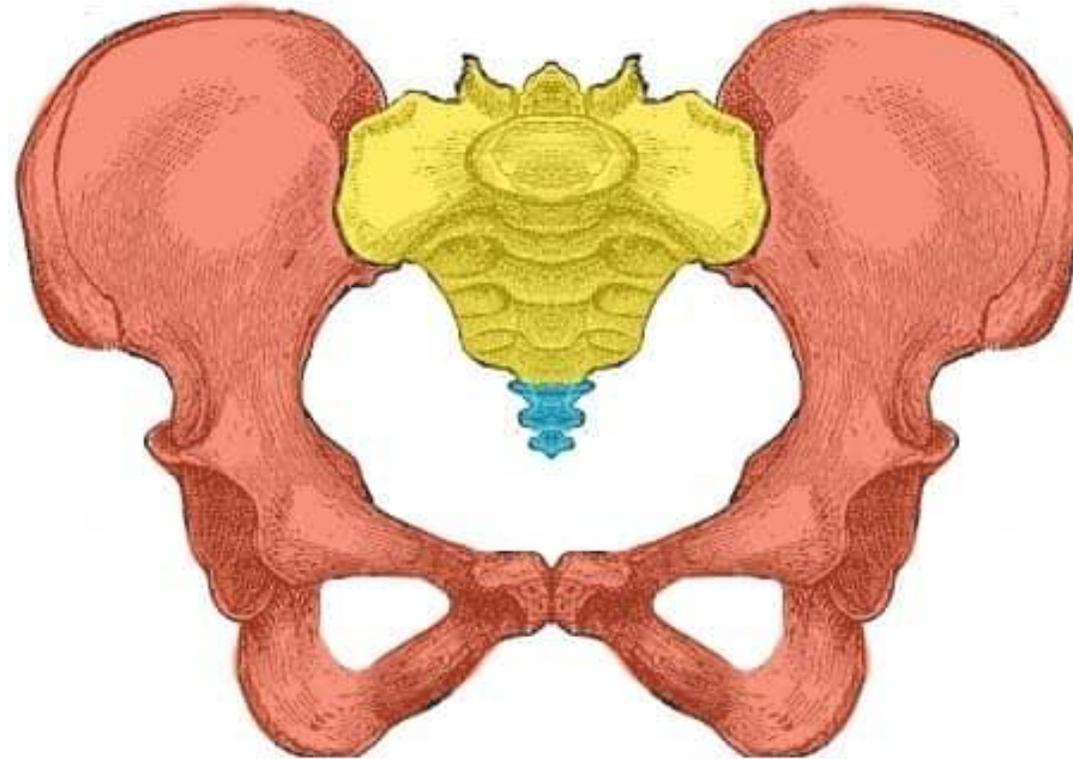
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Bones of the Pelvis

4 bones:

- 2 Hip bones.
- Sacrum.
- Coccyx.



-  Hip bones
-  Sacrum
-  Coccyx

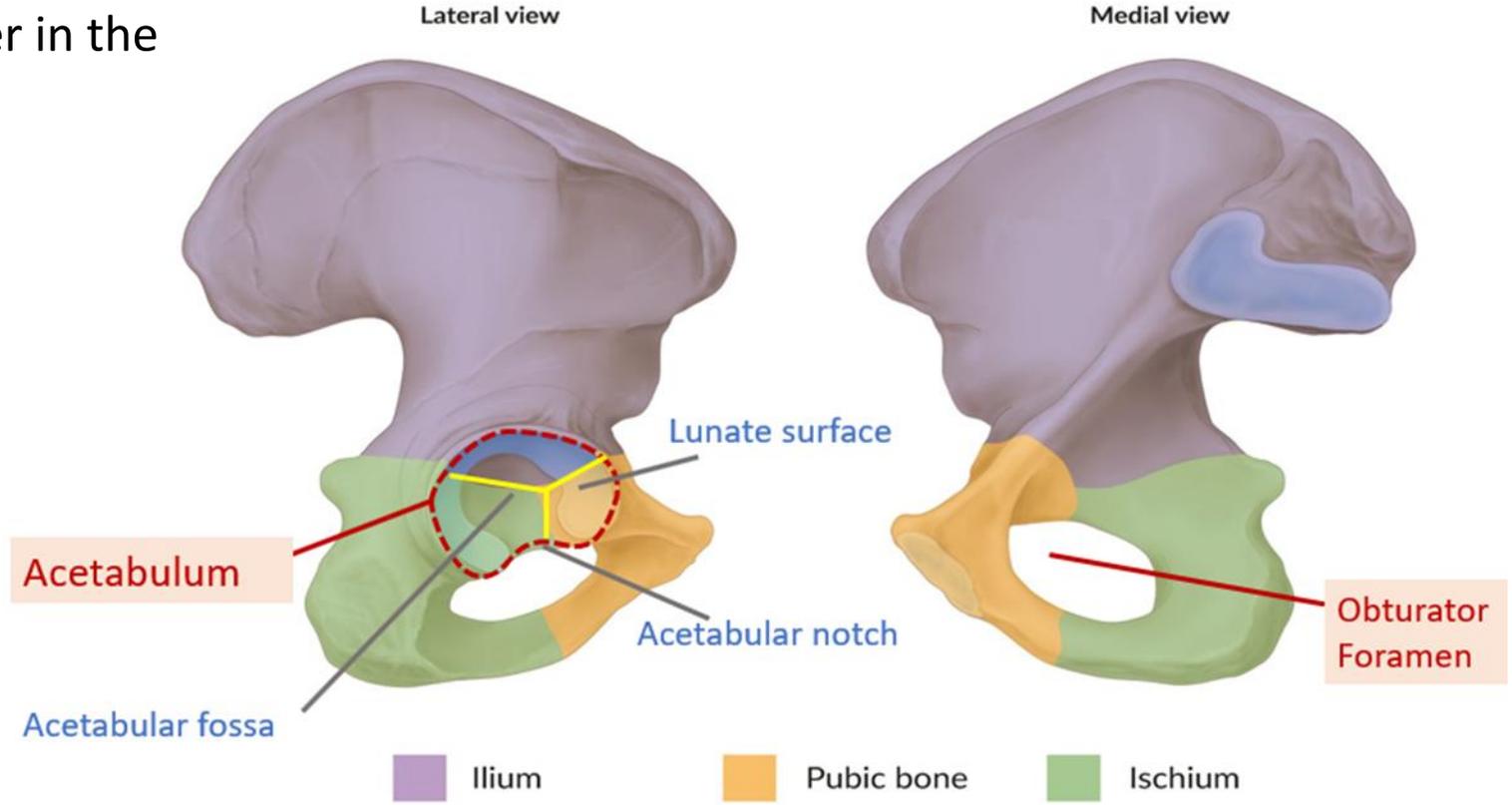
HIP BONE

❖ Formed of 3 bones articulating together in the **acetabulum**

➤ Ileum

➤ Pubic bone

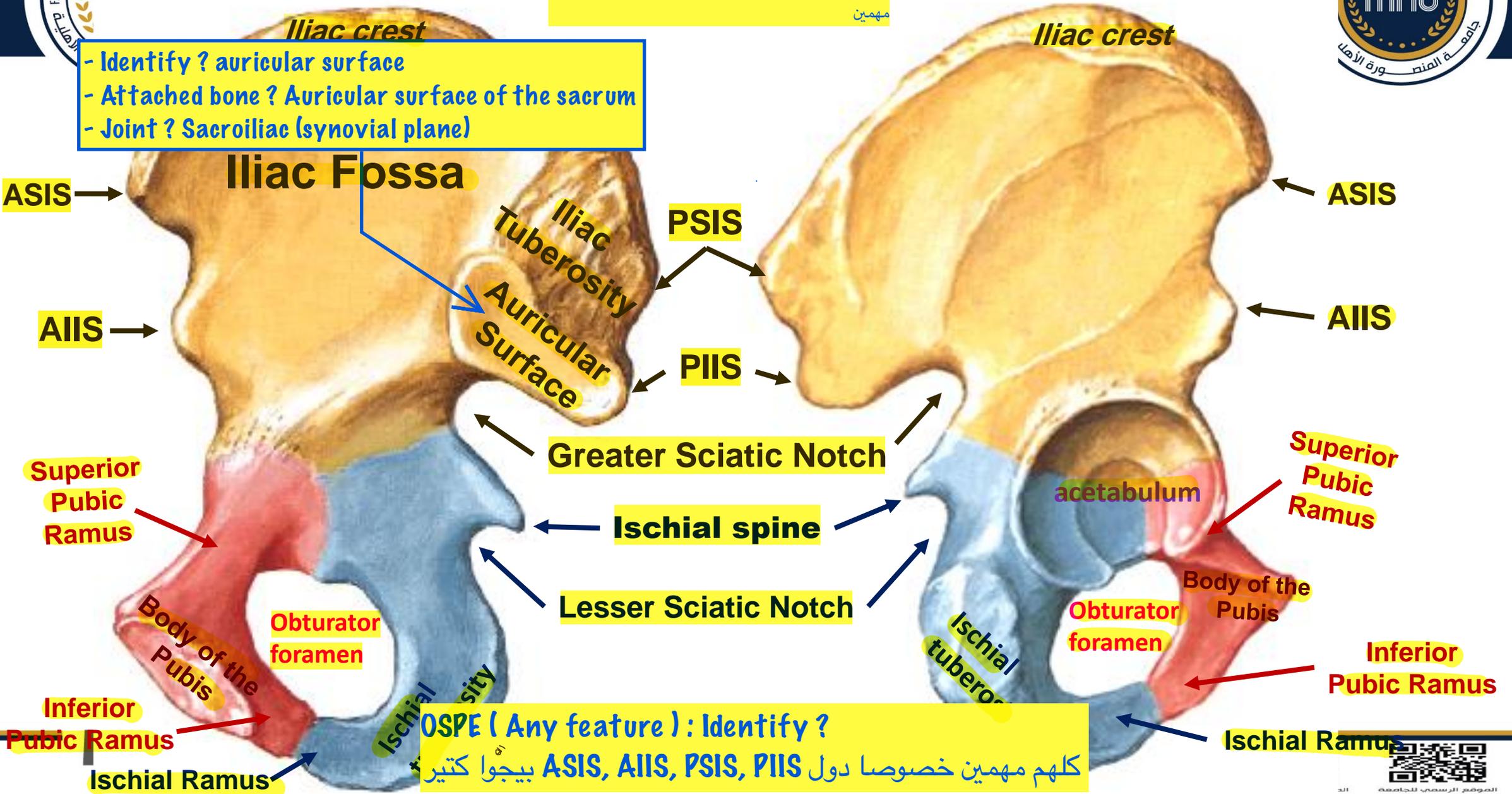
➤ ischium



Medial View

- Ms pass through lesser sciatic notch (Obturator internus)
- Ms pass through greater sciatic notch (Pyriforms)
مهمين

Lateral View



- Identify ? auricular surface
- Attached bone ? Auricular surface of the sacrum
- Joint ? Sacroiliac (synovial plane)

OSPE (Any feature) : Identify ?
كلهم مهمين خصوصا دول ASIS, AIIS, PSIS, PIIS بييجوا كثير



SACRUM

- **The fused five sacral vertebrae.**
- Inverted triangle.
- **Base:** Articulates with the fifth lumbar vertebra.
Sacral promontory: the projecting anterior margin of S1 vertebra.
Ala of sacrum: on each side of sacral promontory.
- **Apex:** Articulates with the coccyx.
- **4 Surfaces:**
 - **Anterior (Pelvic surface):** Has 4 anterior sacral foramina on each side.
 - **Posterior surface shows:**
 - posterior sacral foramina (4 on each side).
 - Sacral hiatus: the lower end of sacral canal.
 - Spinous tubercles: the fused sacral spines.
 - **2 Lateral surfaces:** articulates with the ilium through the upper wide part named (Auricular surface) .

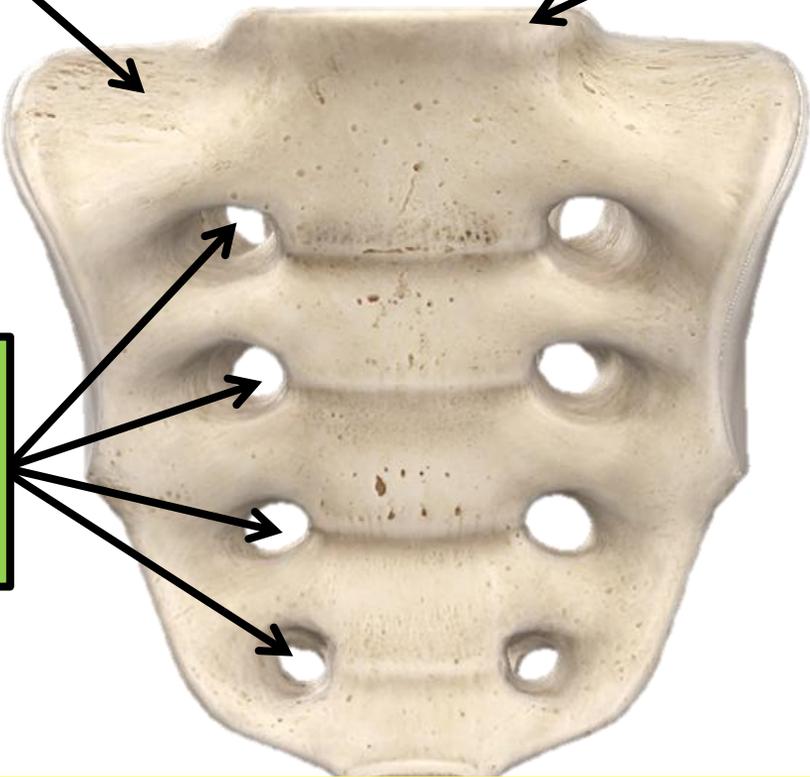


SACRUM

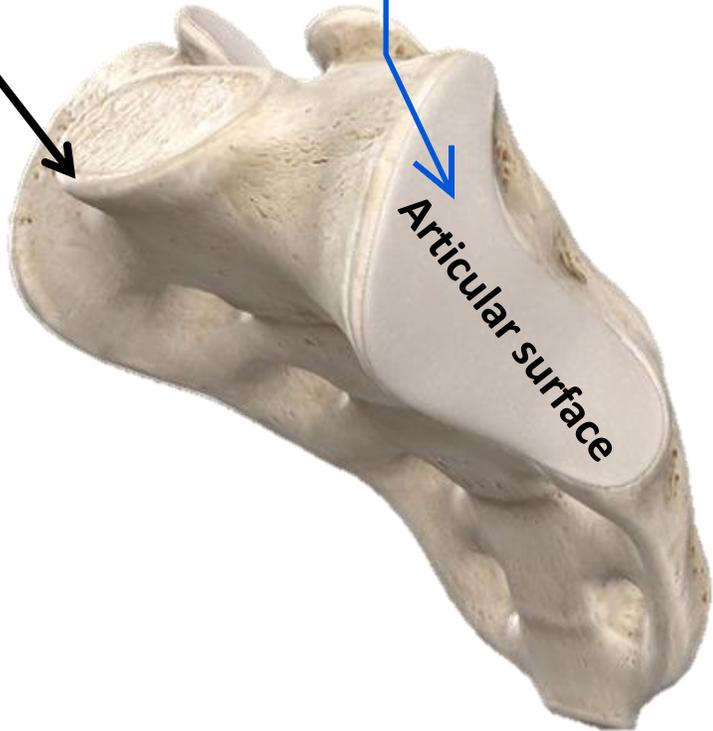
Sacral promontry

- Identify ?
- Joint ? Sacroiliac (synovial plane)

Ala of sacrum

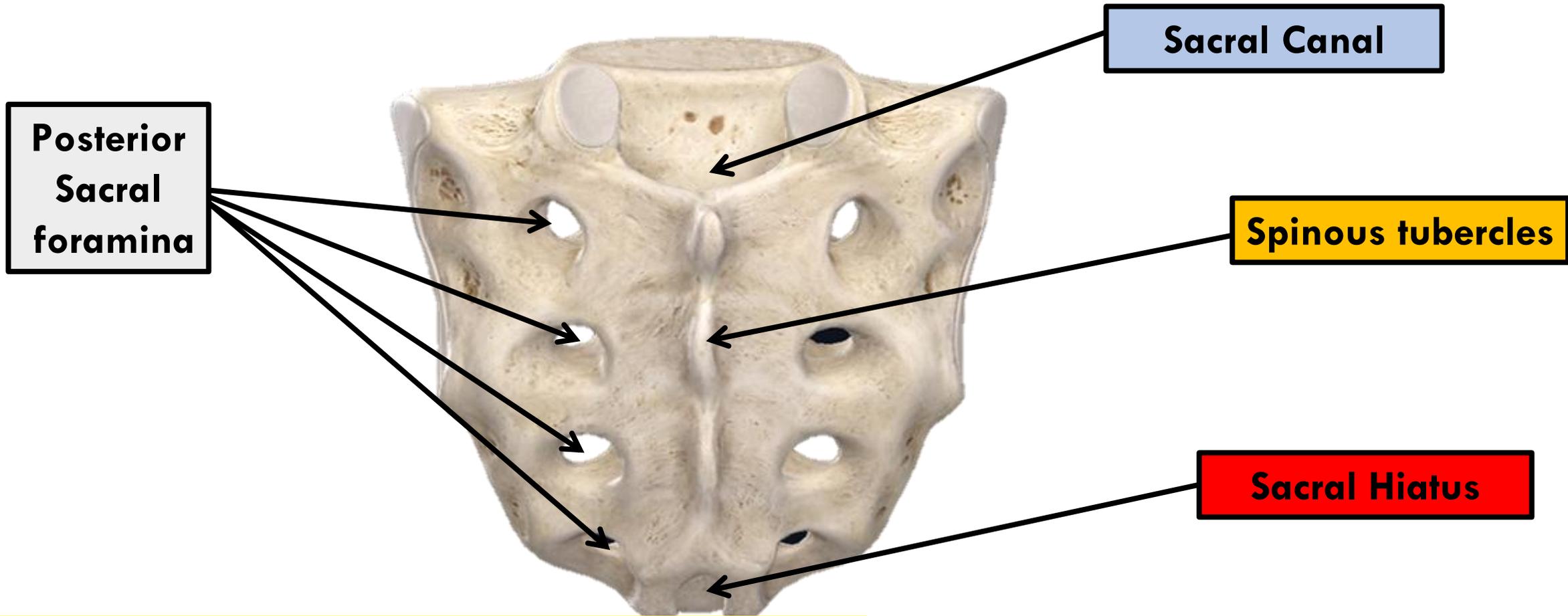


Anterior Sacral foramina



OSPE : Identify (Any feature) ?

SACRUM



OSPE : Identify (Any feature) ?

Joints of the pelvis

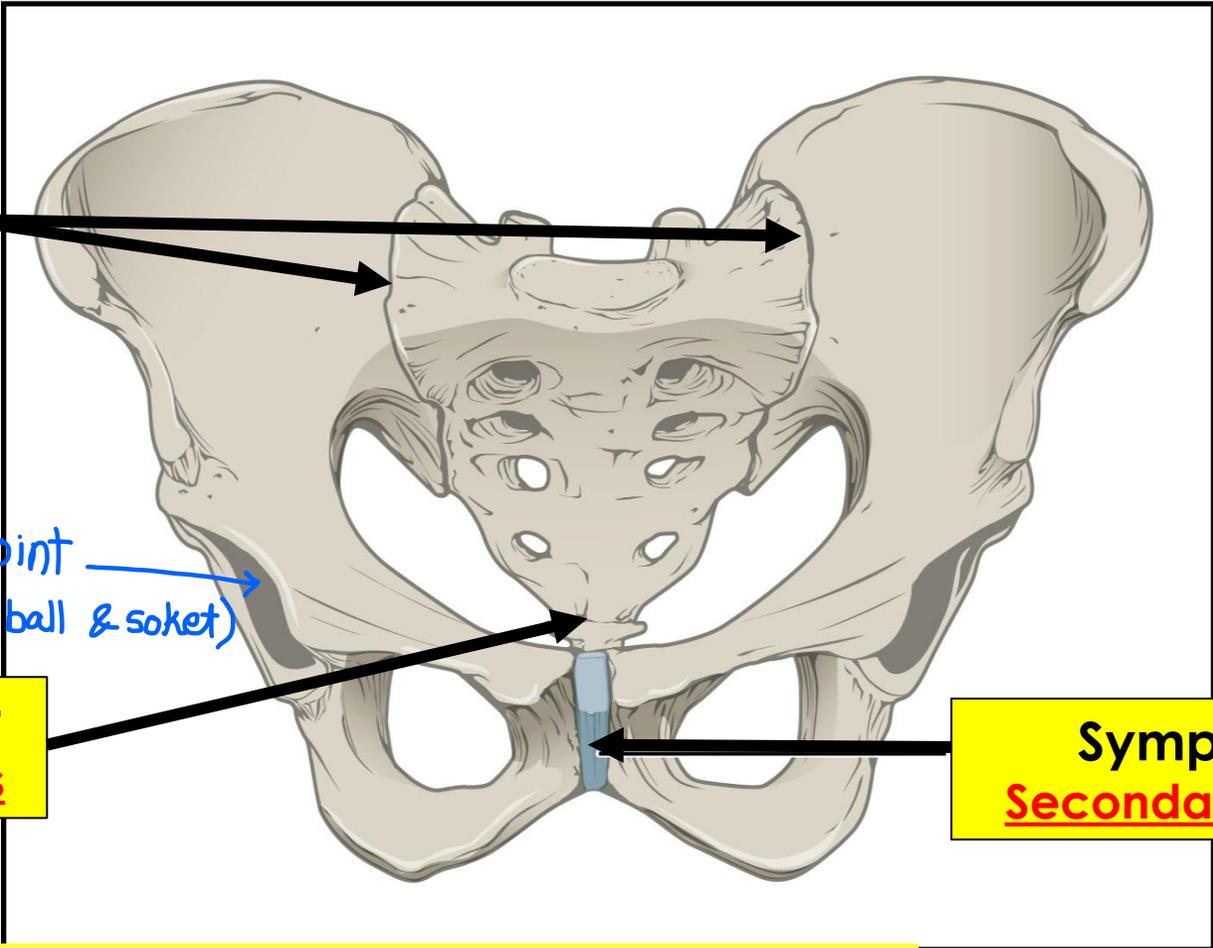
4 joints

2 Sacroiliac joint
Synovial plane

Hip joint
(synovial ball & socket)

Sacrococcygeal joint
Secondary cartilaginous

Symphysis pubis
Secondary cartilaginous



OSPE : Identify (Joint & type) ?

Ligaments of the pelvis

○ Sacroiliac ligaments:

- Connect sacrum with the ilium.

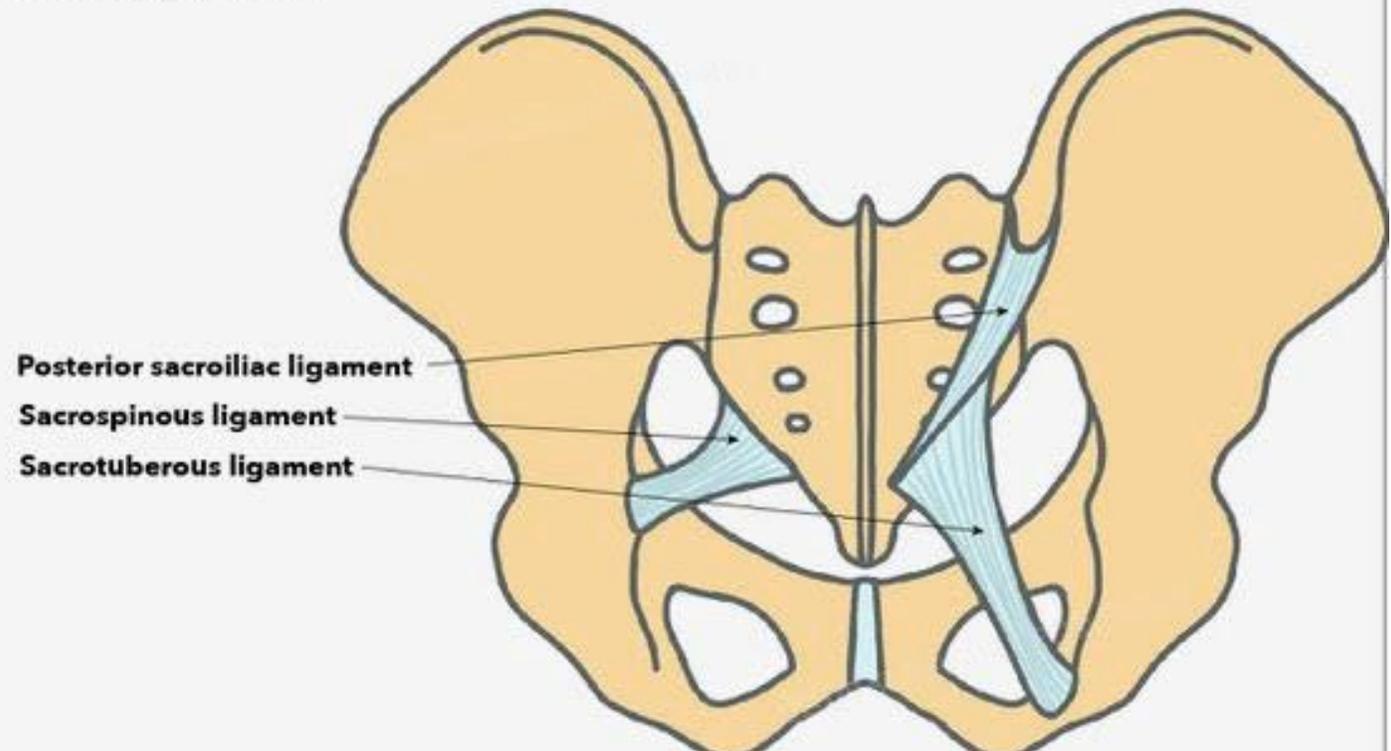
○ Sacrospinous ligament:

- Connect sacrum & Coccyx with ischial spine.

○ Sacrotuberous ligament:

- Connect sacrum & Coccyx with ischial tuberosity.

Pelvic Ligaments



مهم نعرف ان :

ال sacrotuberous و Sacrospinous حولوا ال greater sciatic notch وال lesser sciatic notch ل greater sciatic foramen و lesser sciatic foramen

❖ Pelvic inlet (Pelvic brim):

Extends between sacral promontary & upper margin of symphysis pubis.

❖ Pelvic outlet:

Extends between tip of coccyx & lower margin of symphysis pubis.

❖ Pelvic Cavity:

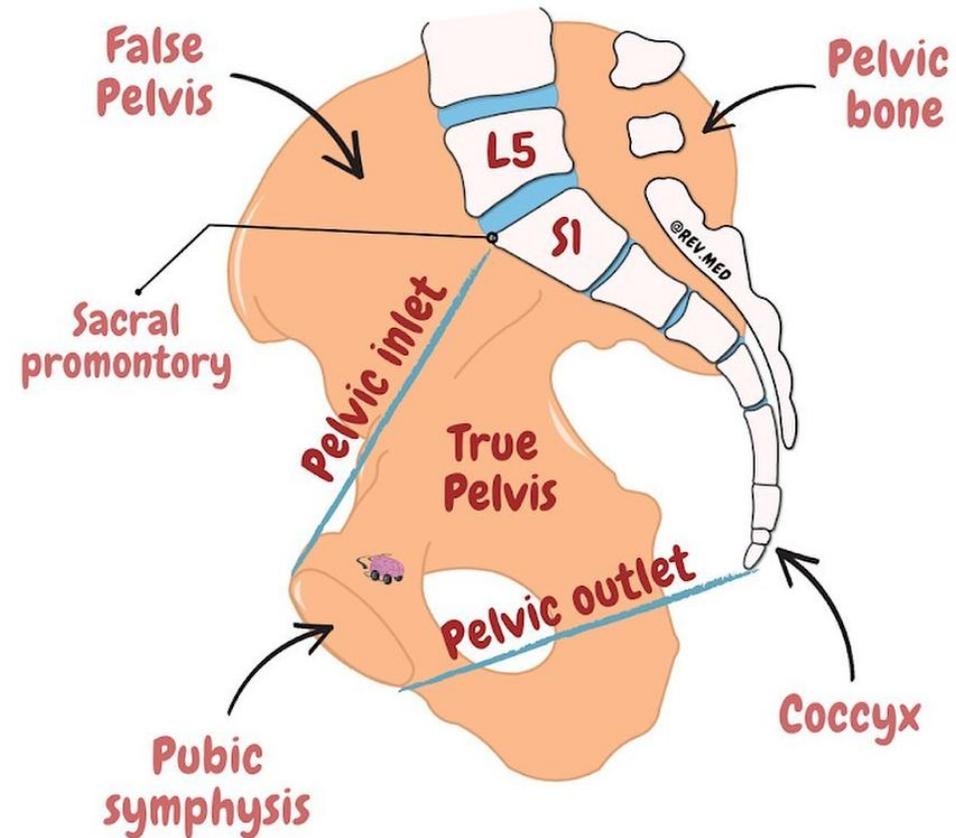
Extends between pelvic inlet & outlet.

❖ Perineum:

Lower part of pelvic cavity overlying pelvic outlet.

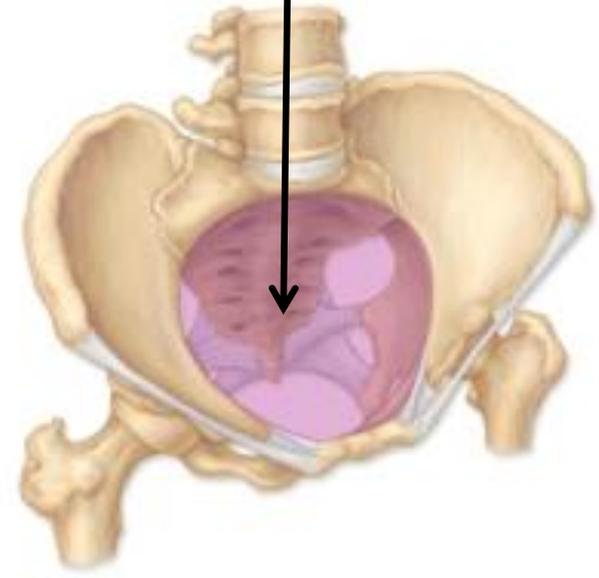
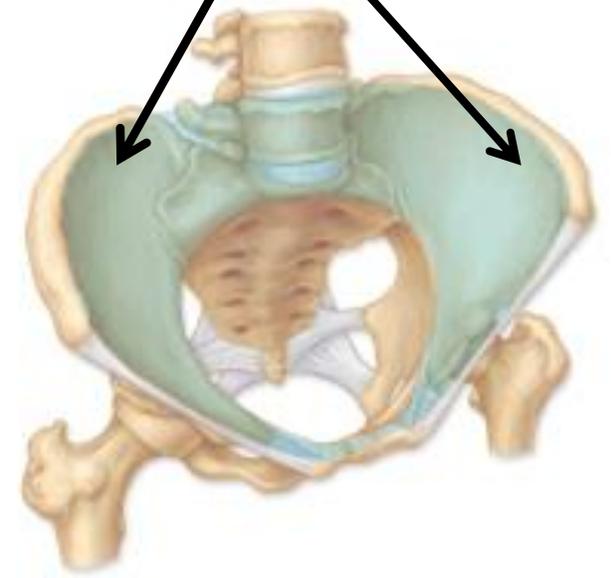
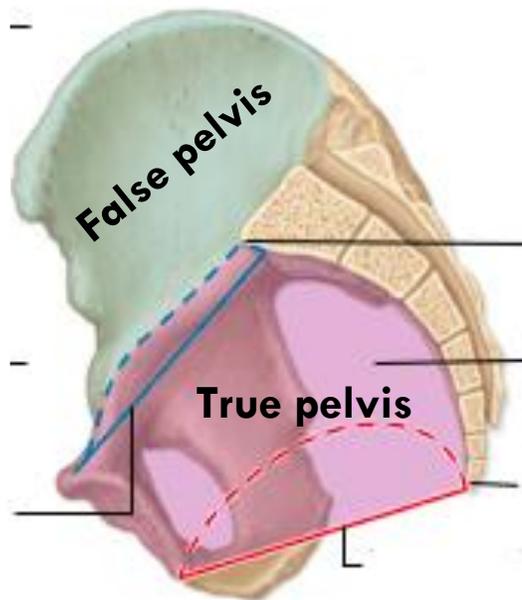
The Pelvis

INLET VS OUTLET



False pelvis

True pelvis



Lies above the pelvic brim.

- Lies below the pelvic brim.
- Has:
 - Pelvic Inlet
 - Pelvic Cavity
 - Pelvic Outlet

- Identify (Any feature) ?
- What is the difference () False pelvis & true pelvis ? Pelvic inlet
- Pelvic inlet boundaries ?

sacrum promantry → Anterior border of ala of sacrum
→ medial border of ilium (Arcade line → iliopectinal eminence → superior pubic ramus (pubic crest) → Body of pubis.

Muscles of the pelvis

1) Muscles of the wall of the pelvis:

1. Obturator internus.

2. Piriforms

طالع من Middle piece of anterior surface of sacrum

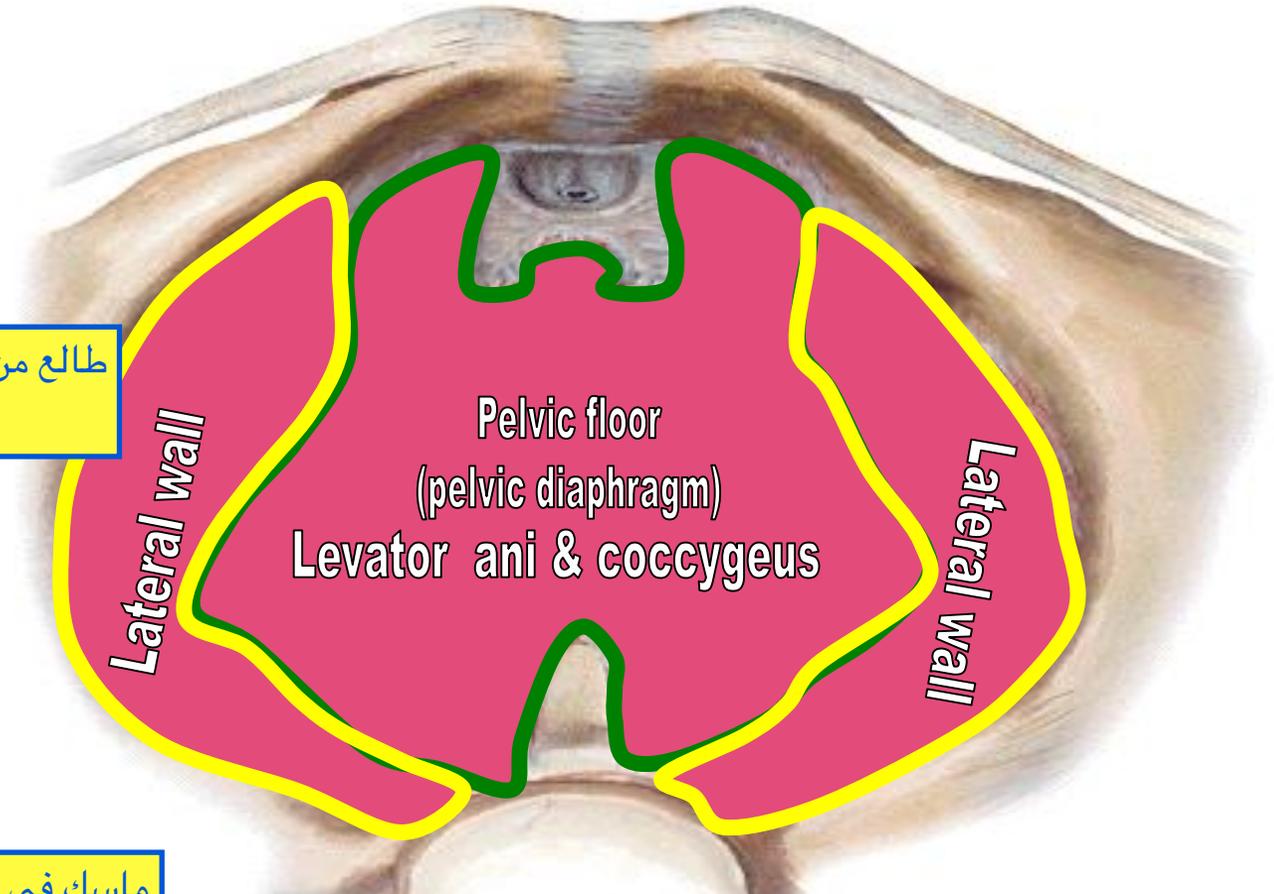
2) Muscles of the floor of the pelvis

[Pelvic diaphragm]

1. Levator ani.

2. Coccygeus

ماسك في last piece of sacrum & First piece of coccyx



- OSPE : Enumerate?

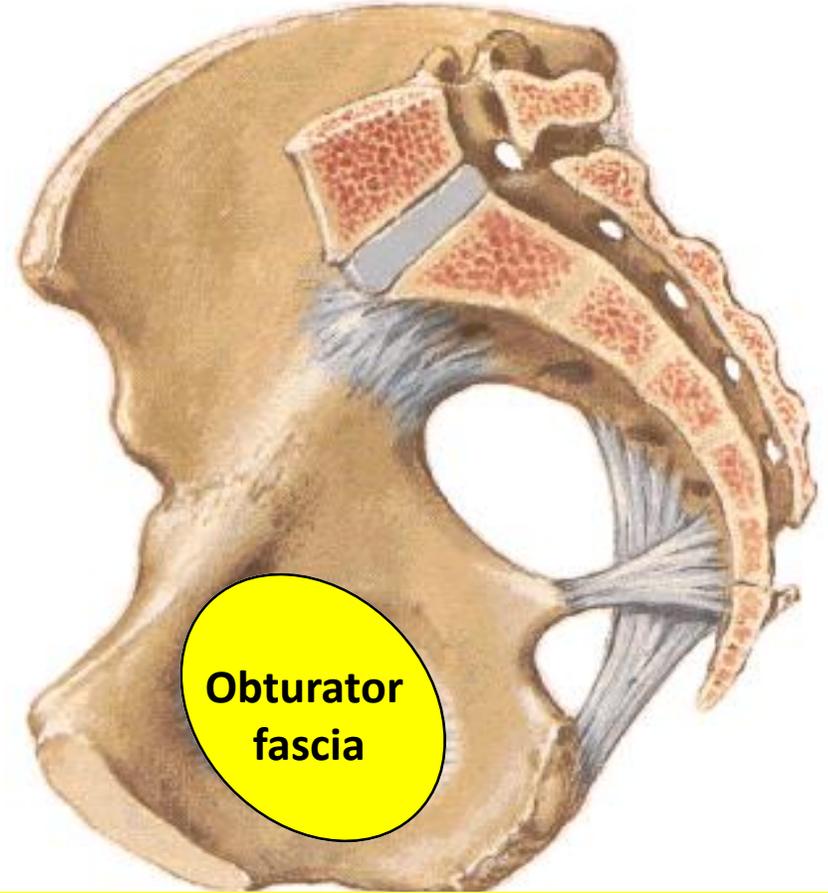
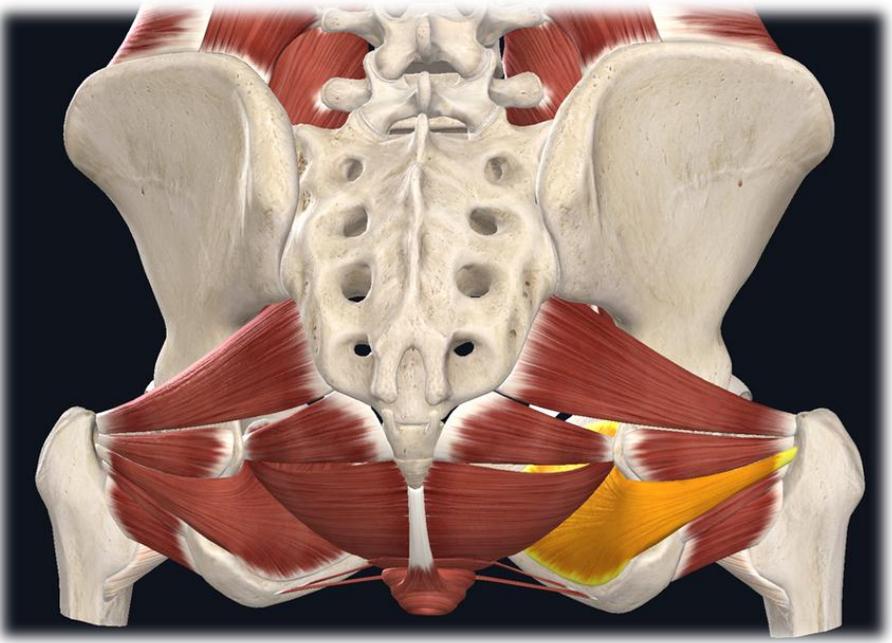
- Identify (Piriform - Coccygeus) ?



Muscles of the wall of pelvis

Obturator Internus

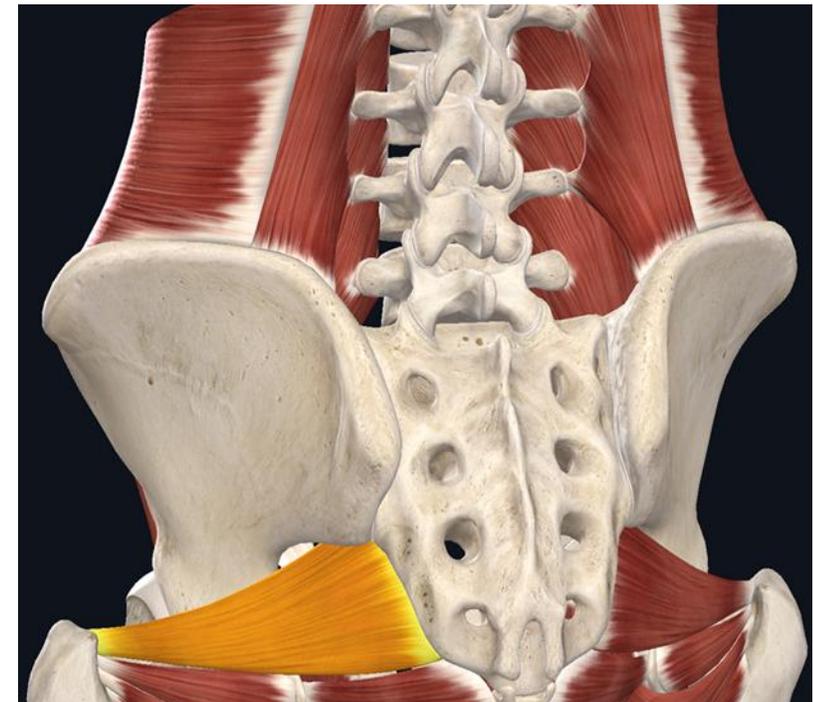
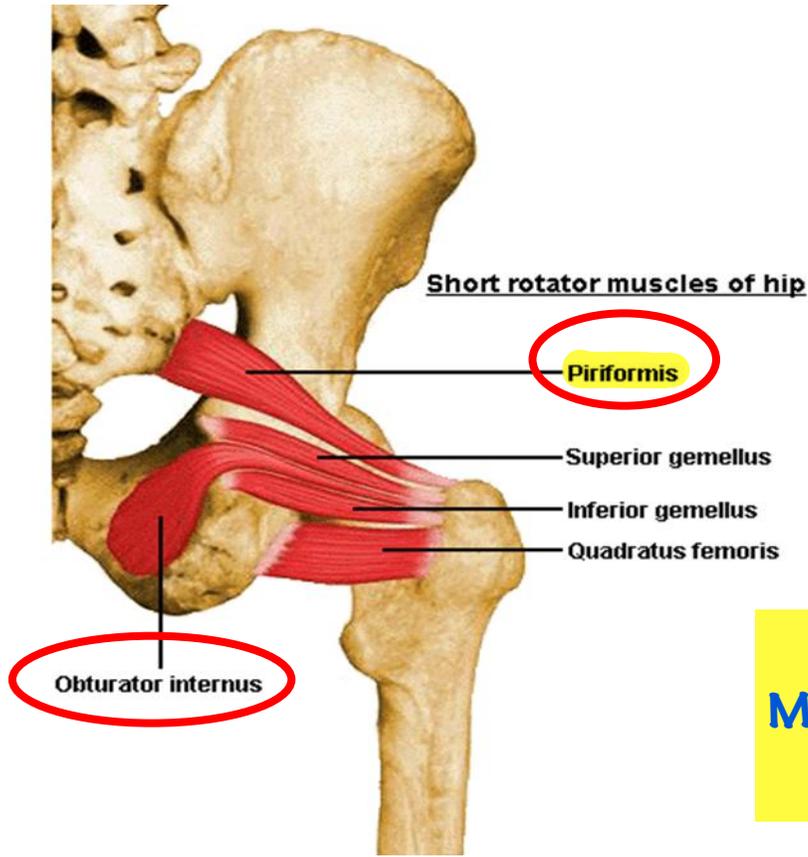
- **Origin:**
Obturator membrane.
 - **Insertion:**
Greater trochanter of femur.
- The muscle is covered with obturator fascia.



Muscles of the wall of pelvis

Piriformis Muscle

- **Origin:**
Anterior surface of sacrum.
- **Insertion:**
Greater trochanter of femur.

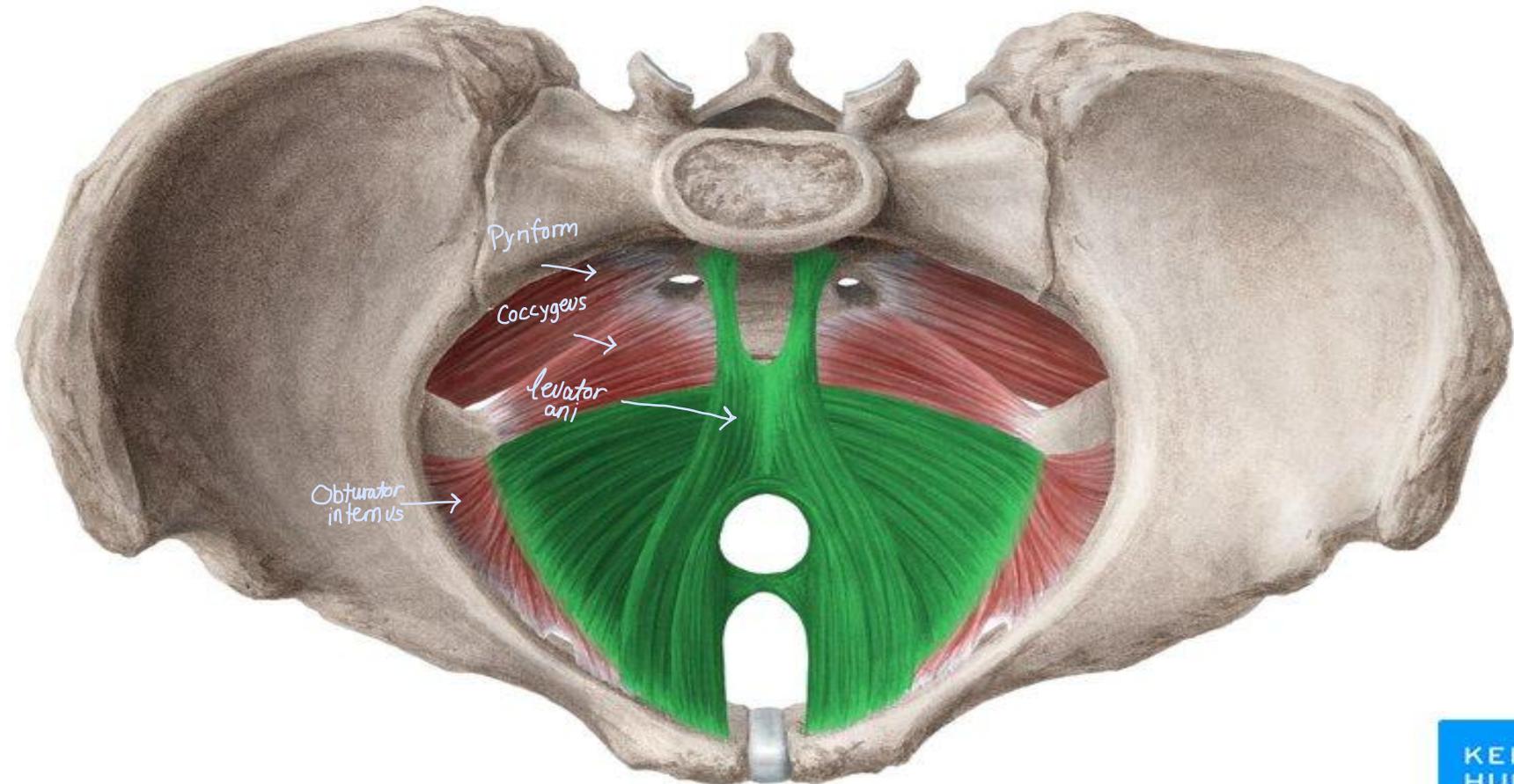


يشاور على
Middle piece of anterior surface of sacrum
وييسألك
Attached ms

Muscles of the floor of pelvis

Levator Ani

- Origin:**
1. Body of pubis
 2. White line
 3. Ischial spine



KEN HUB

مهم جدا نعرفها بالlabels

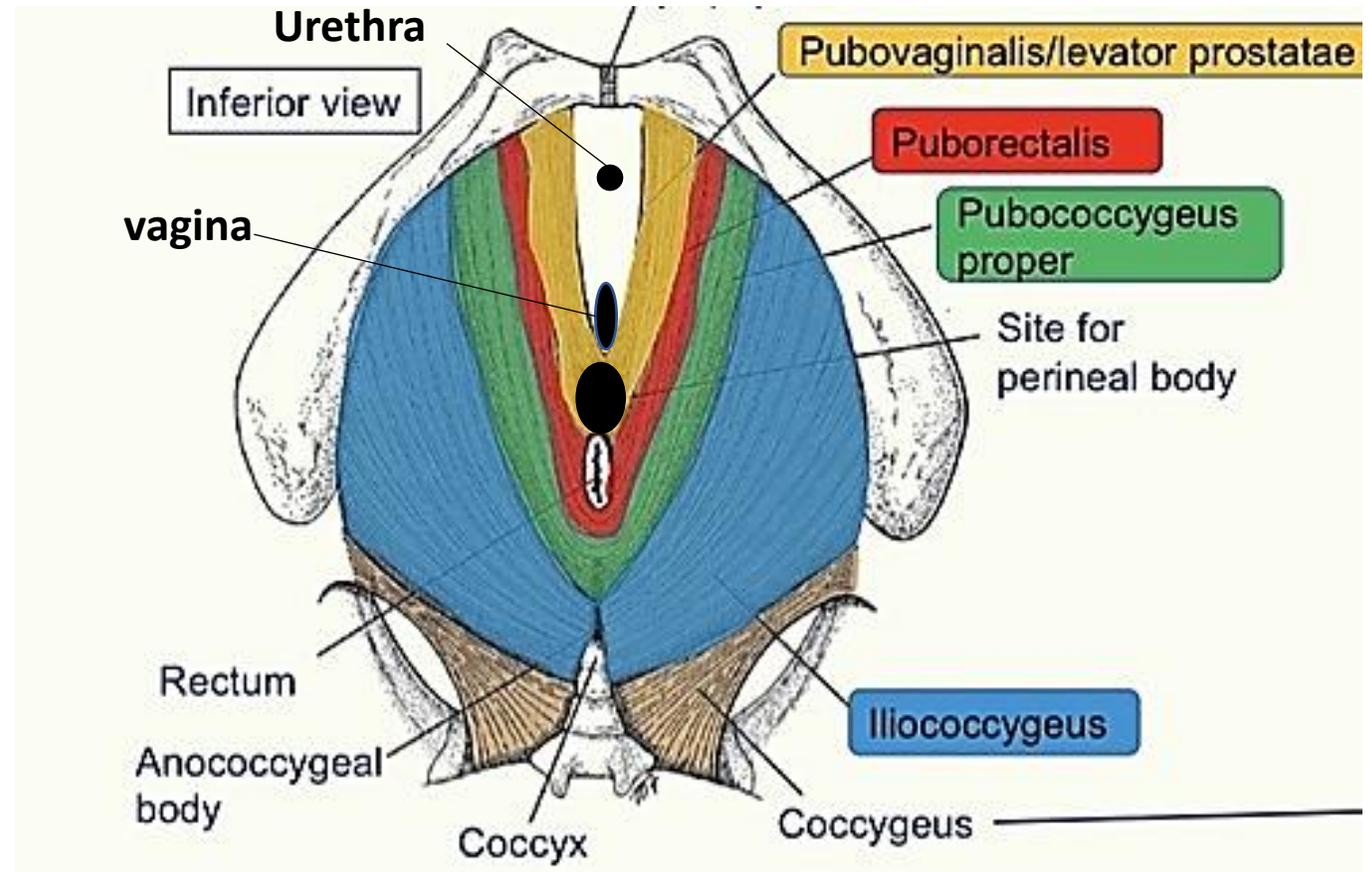
Muscles of the floor of pelvis

Levator Ani

مهمة مجرد أسماء

Insertion:

- **Anterior fibers (Levator prostate or sphincter vaginae):** inserted in perineal body.
- **Middle fibers (puborectalis):** Form U shaped loop around anorectal junction.
- **Posterior fibers:** inserted in anococcygeal body & tip of coccyx



Muscles of the floor of pelvis

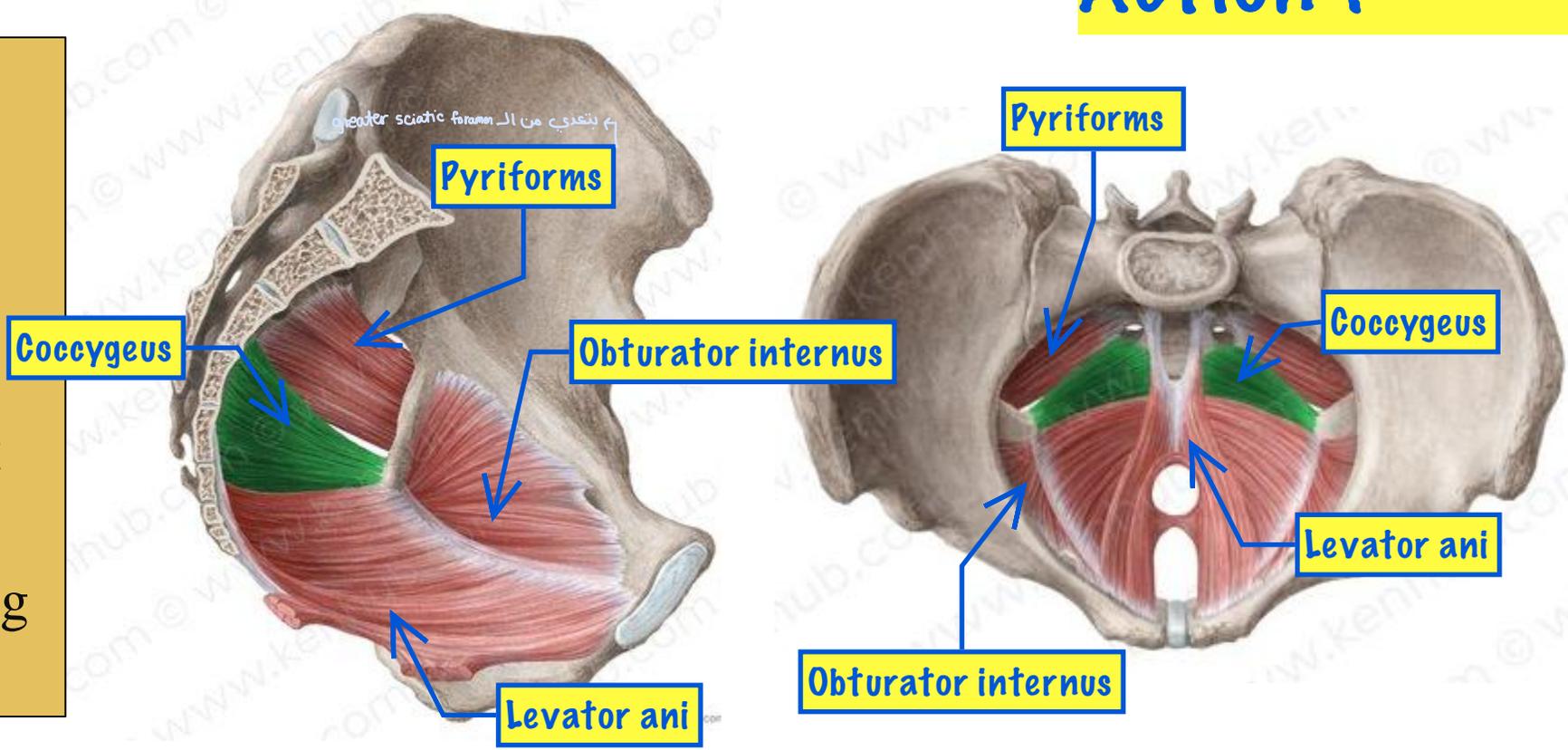
Label ?
Nerve supply ?
Action ?

Coccygeus

Origin:
Ischial spine

Insertion:
last piece of sacrum
&
First piece of coccyx

Action:
Support coccyx during defecation or labor.





WITH NOTES

Anatomy of the Male & Female Genital Systems

Department of human Anatomy and Embryology
Faculty of Medicine
Mansoura National University, Egypt

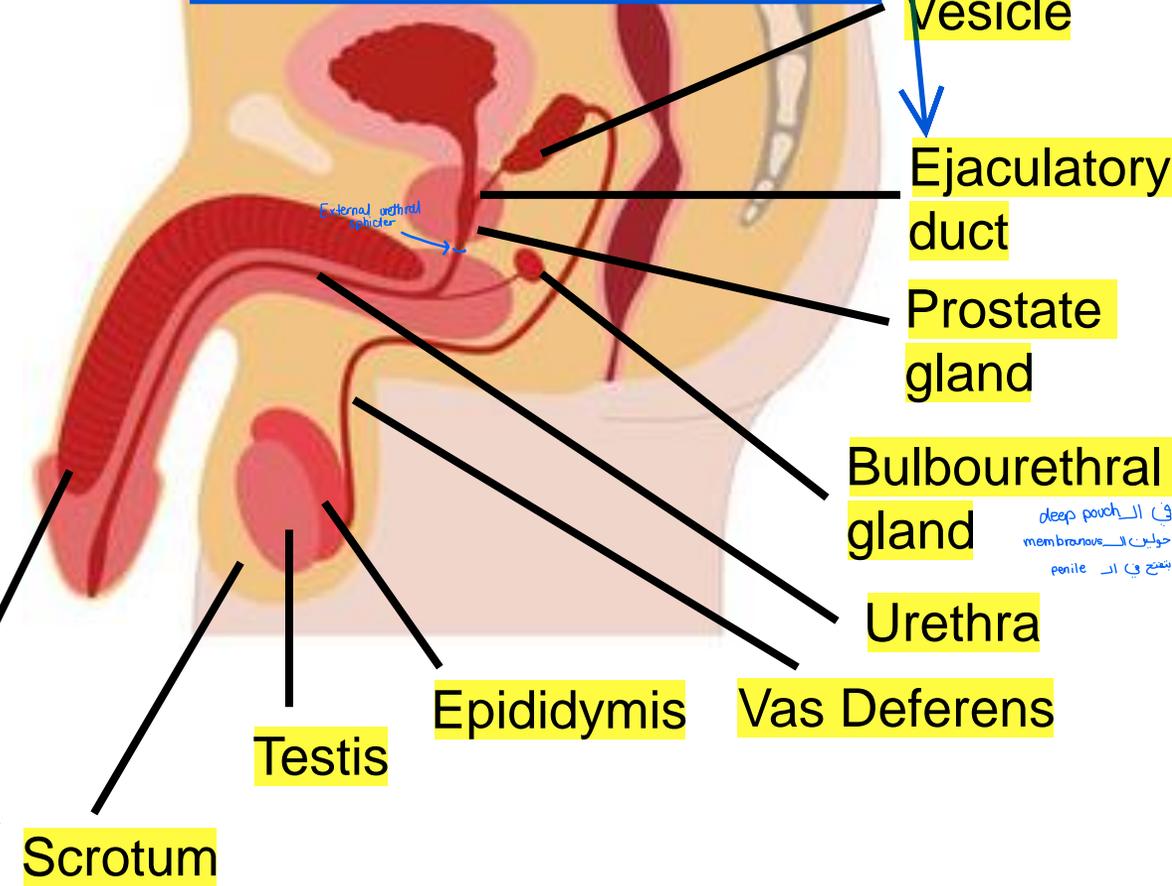
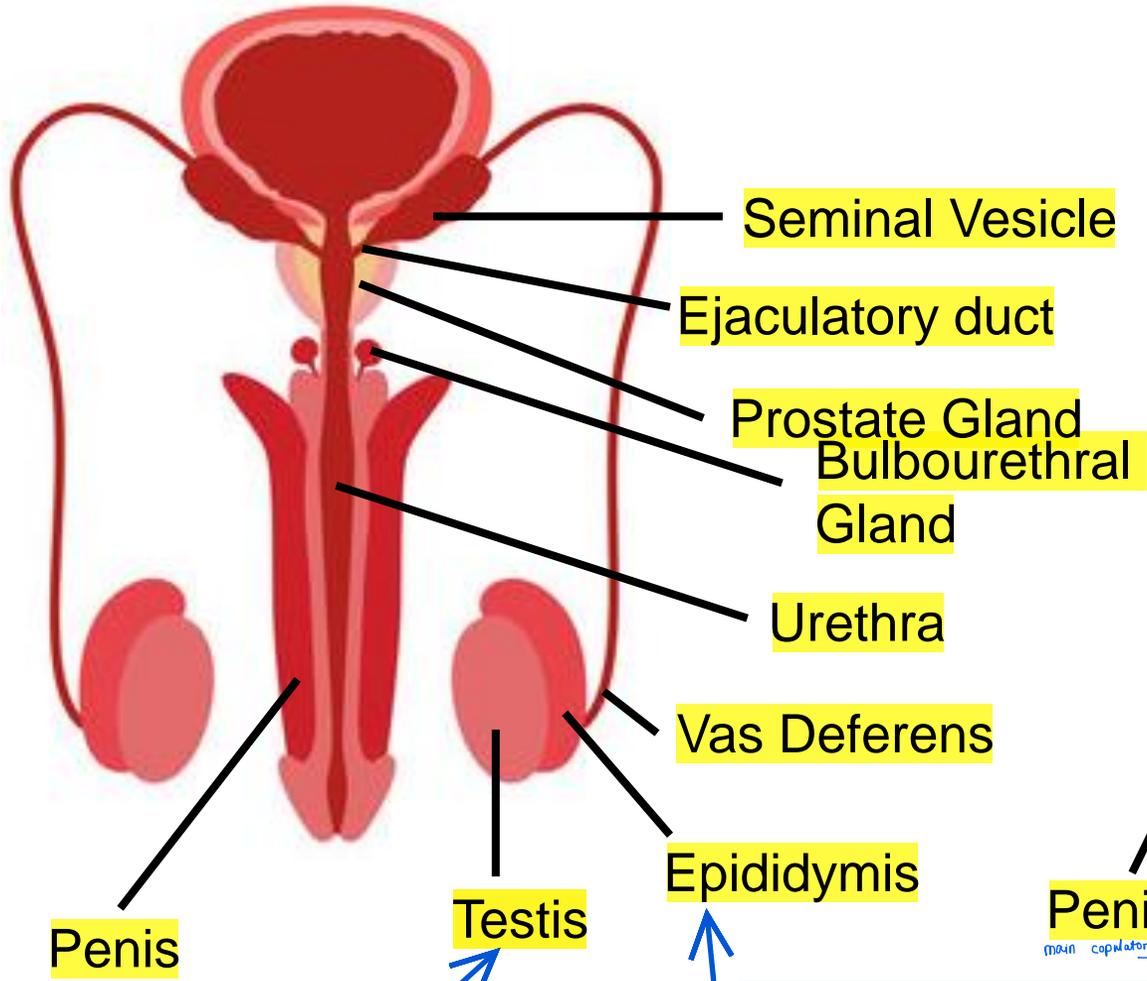
M N U



Male Genital System

- Identify ?

Formed by ? Union of Seminal vesicle & Ampulla of vas deferens
Site ? Behind UB



في الحقيبة العميقة
حولها غشاء
التي تسمى
penile

Identify ?
2 function ? Spermatogenesis & Steroidogenesis

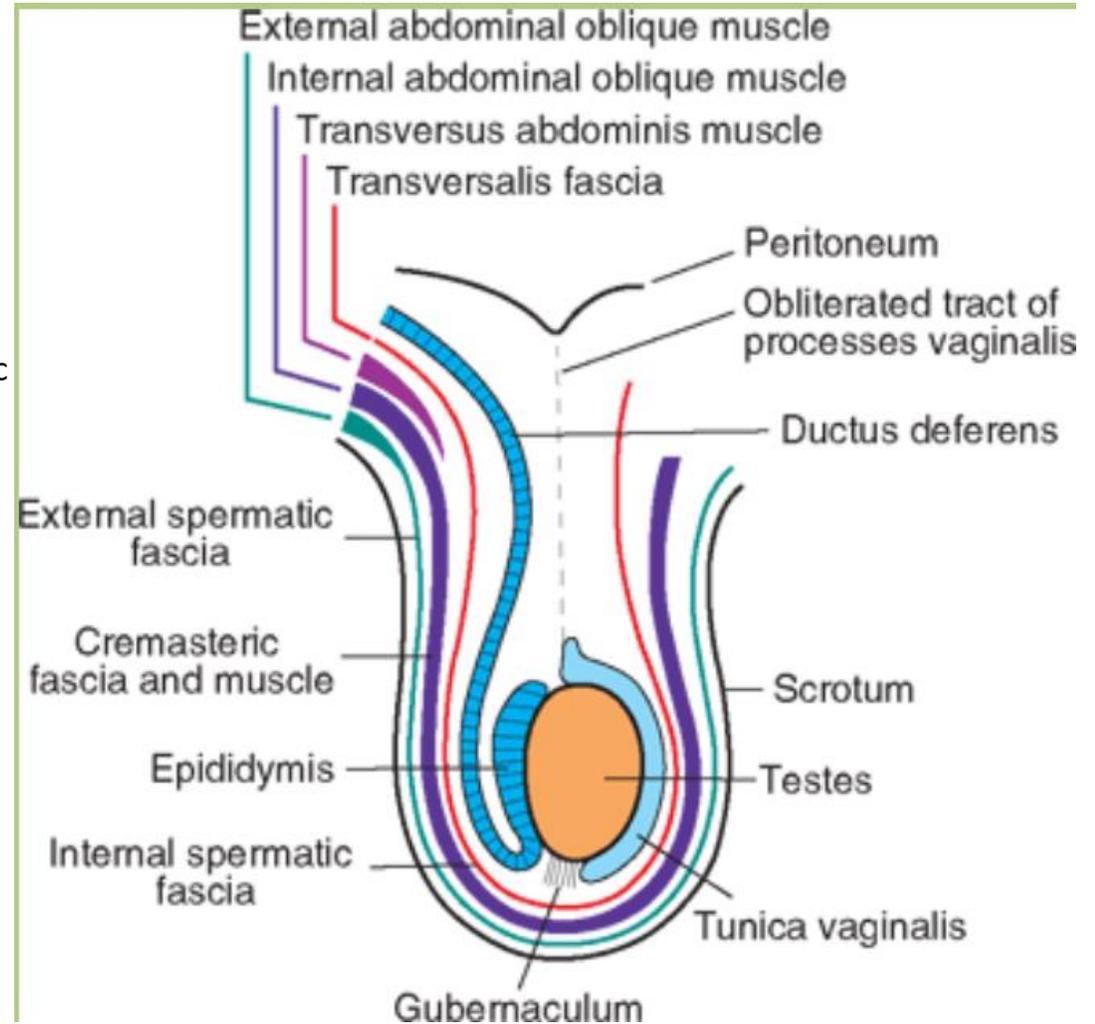
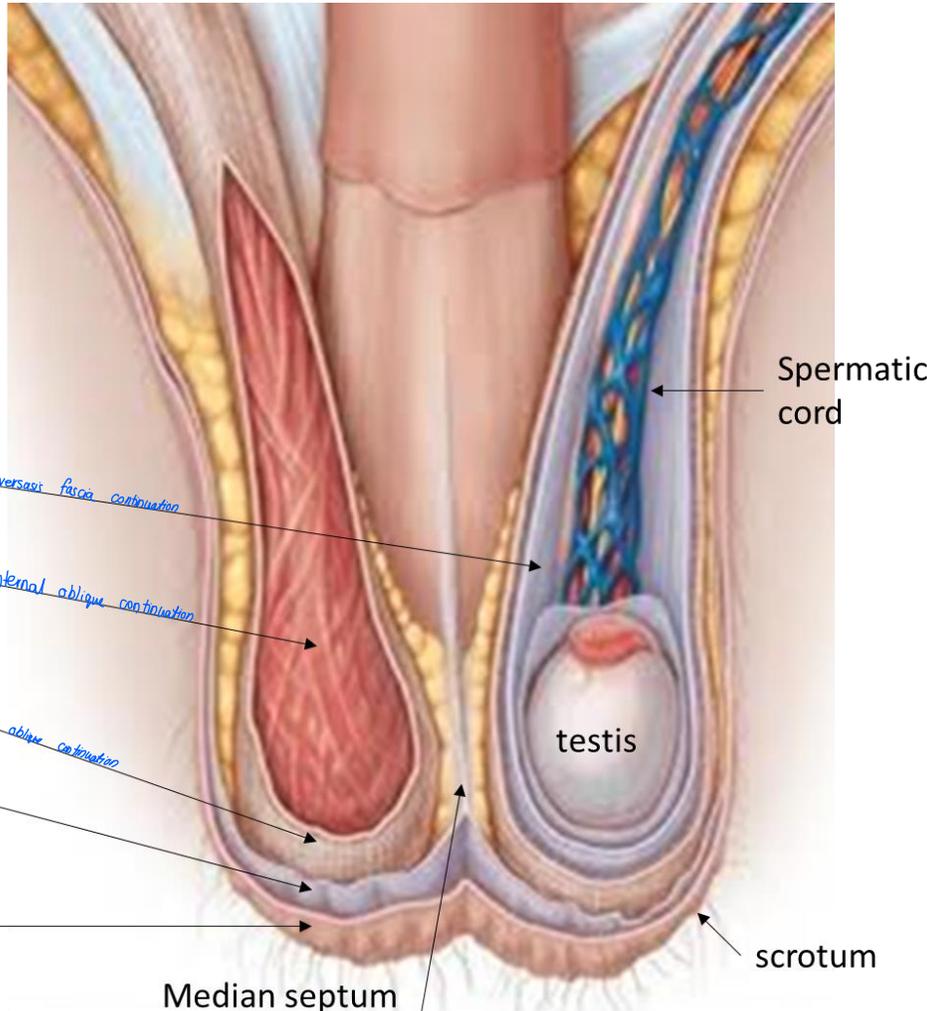
Identify ?
2 function ? Transport - maturation - storage



Enumerate ?

مهم نعرف ال labels

Testis Coverings



Internal spermatic fascia *transversalis fascia continuation*

Cremasteric muscle & fascia *internal oblique continuation*
↳ Elevation of testes in response to cold - Cremasteric reflex

External spermatic fascia *External oblique continuation*

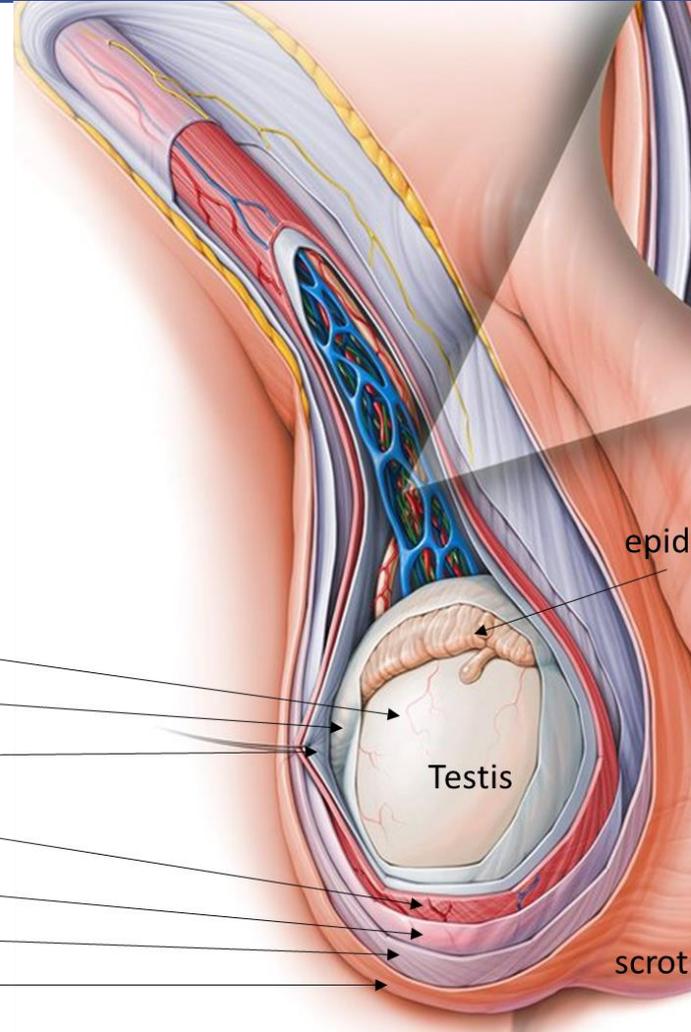
Superficial fascia

Dartos muscle *↳ wrinkling of skin*

skin

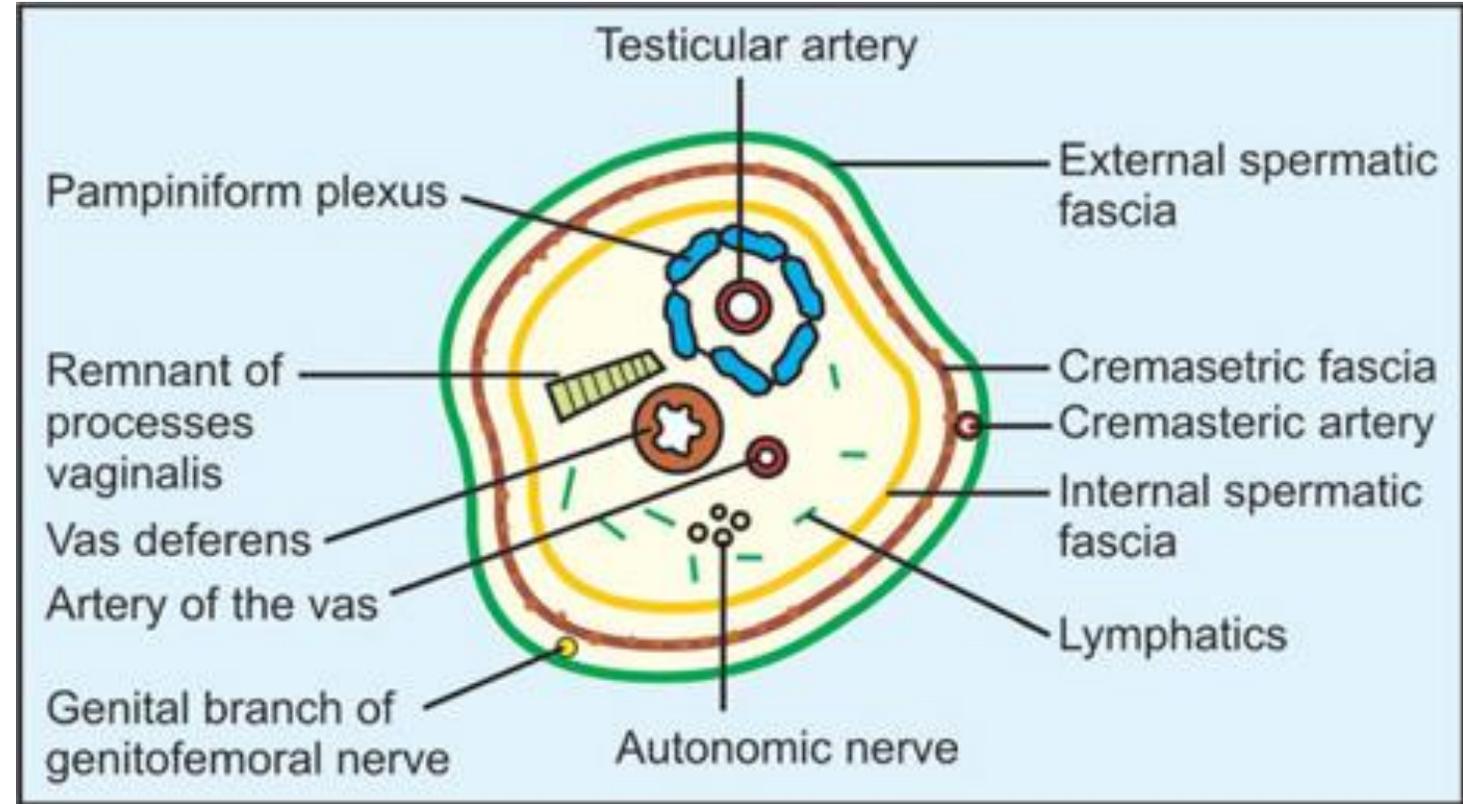
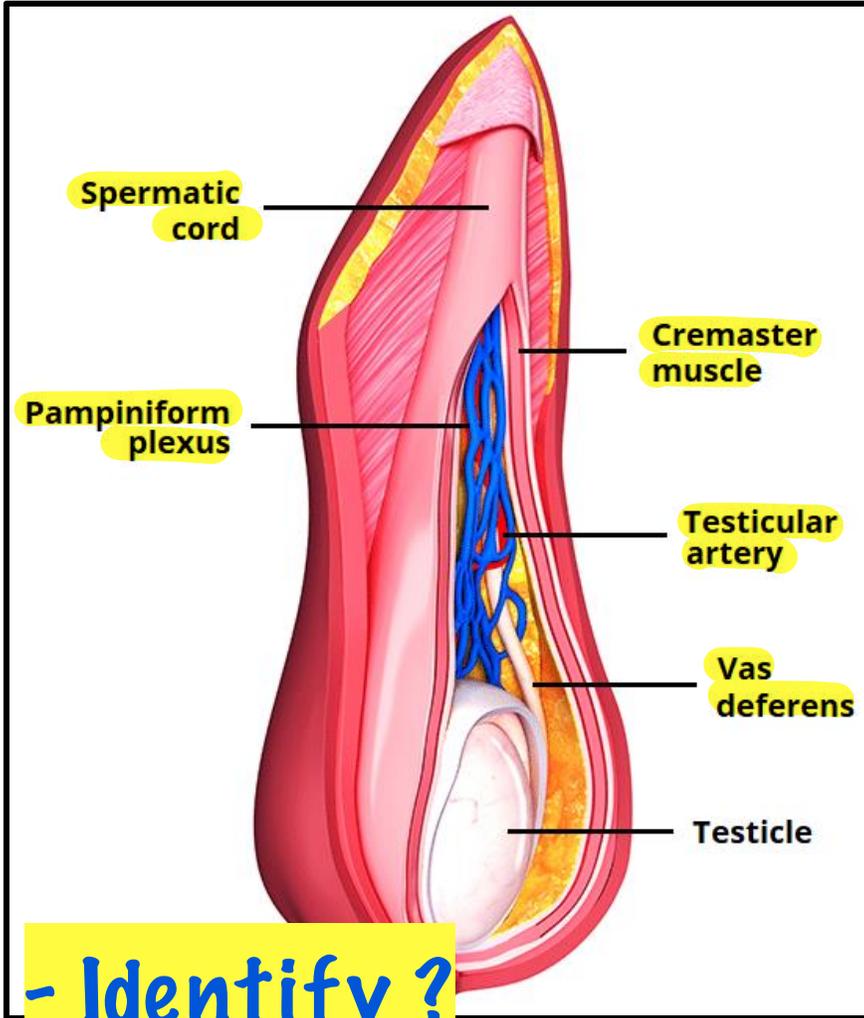
Testis Coverings

Enumerate?
مهم نعرف ال
labels



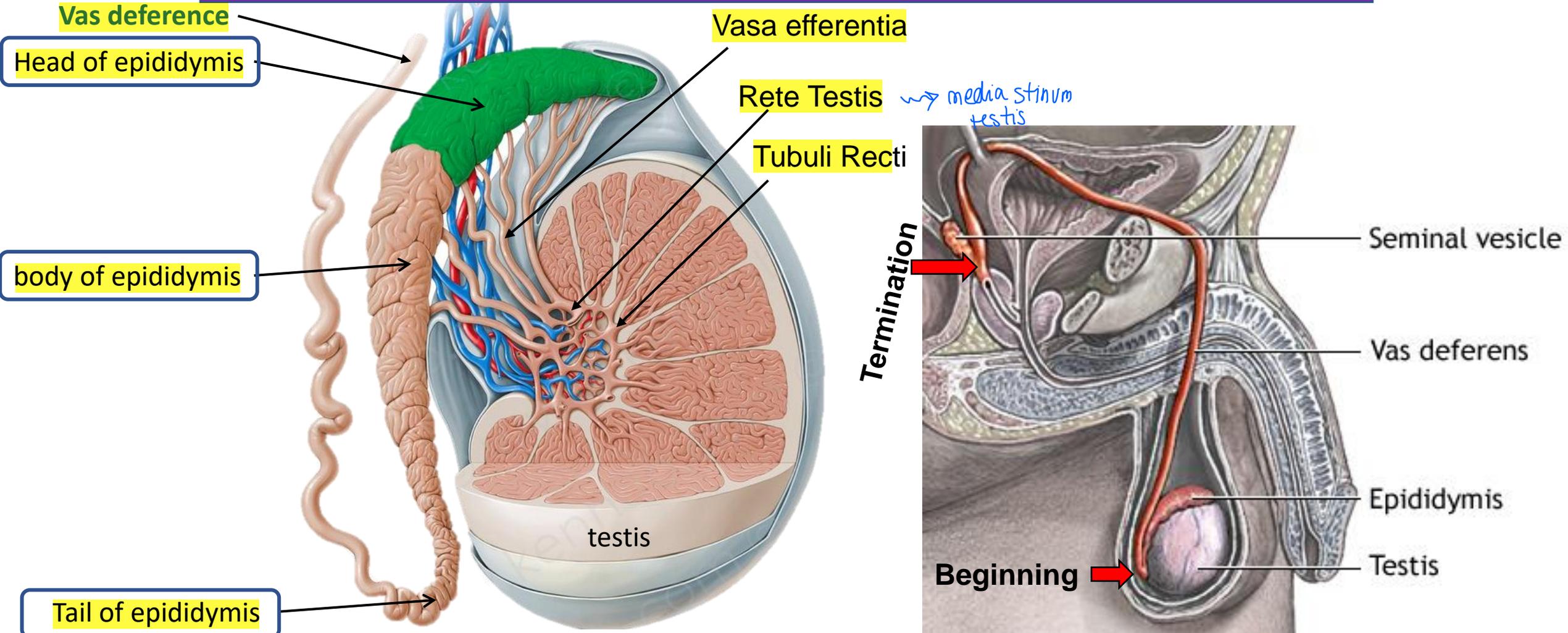
- Tunica albuginea
- Tunica vaginalis
- Internal spermatic fascia
- Cremastric muscle & fascia
- external spermatic fascia
- Superficial fascia & dartos
- skin
- epididymis
- Testis
- scrotum

Spermatic Cord



- Identify ?

Epididymis & Vas Deferens

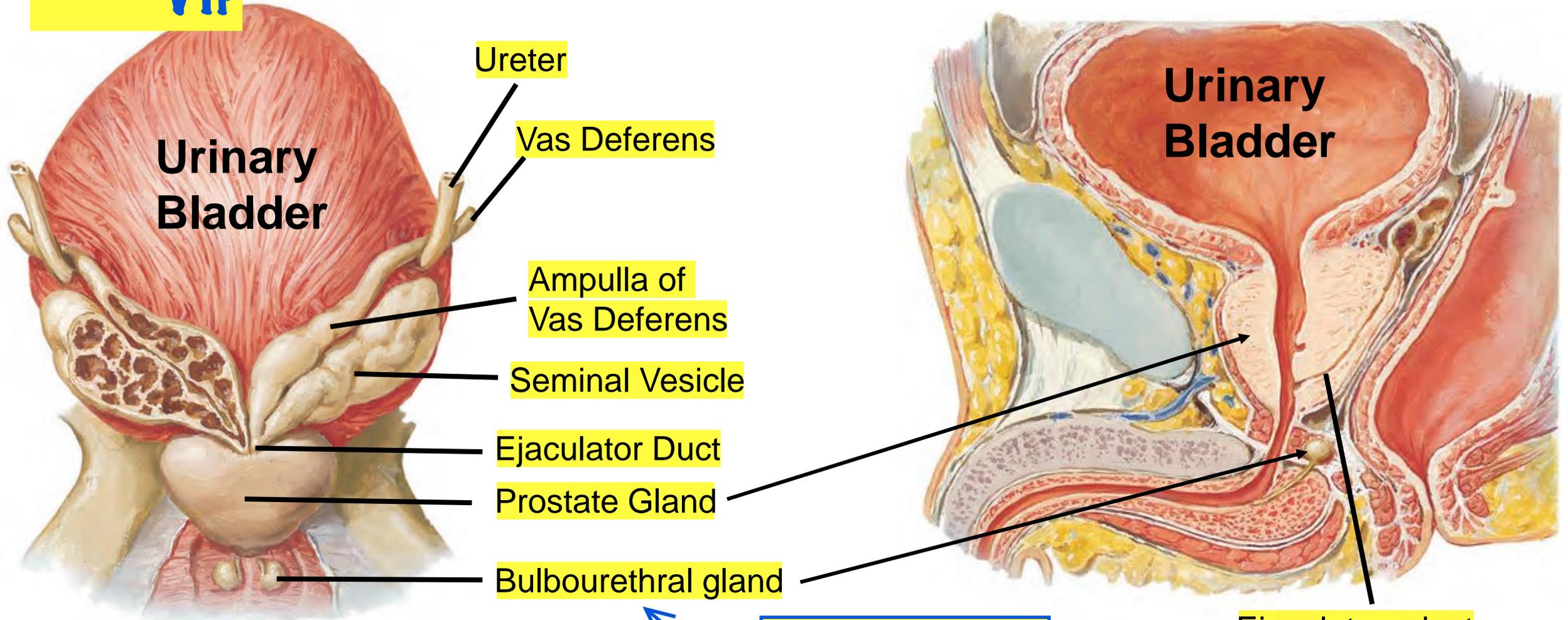


- Identify ?



Seminal Vesicle & Prostate

مهمة جدا
VIP

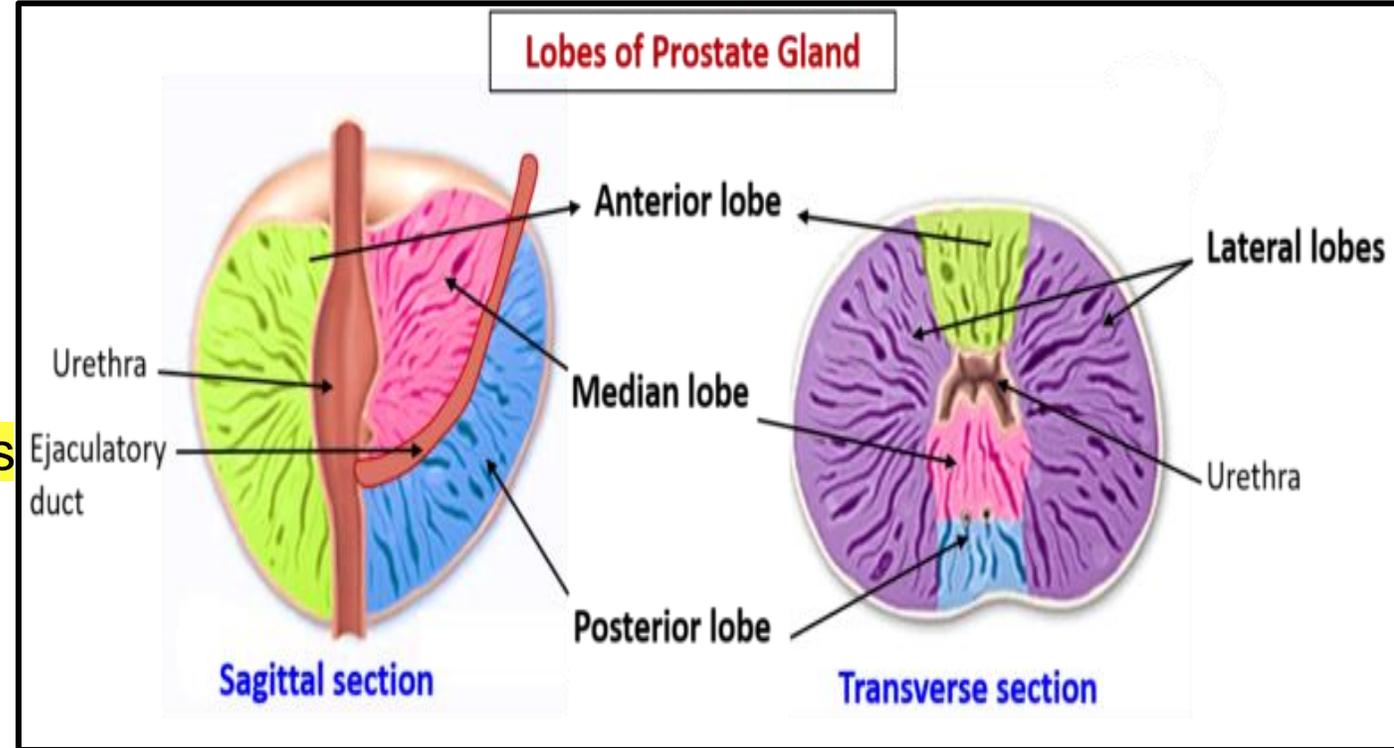
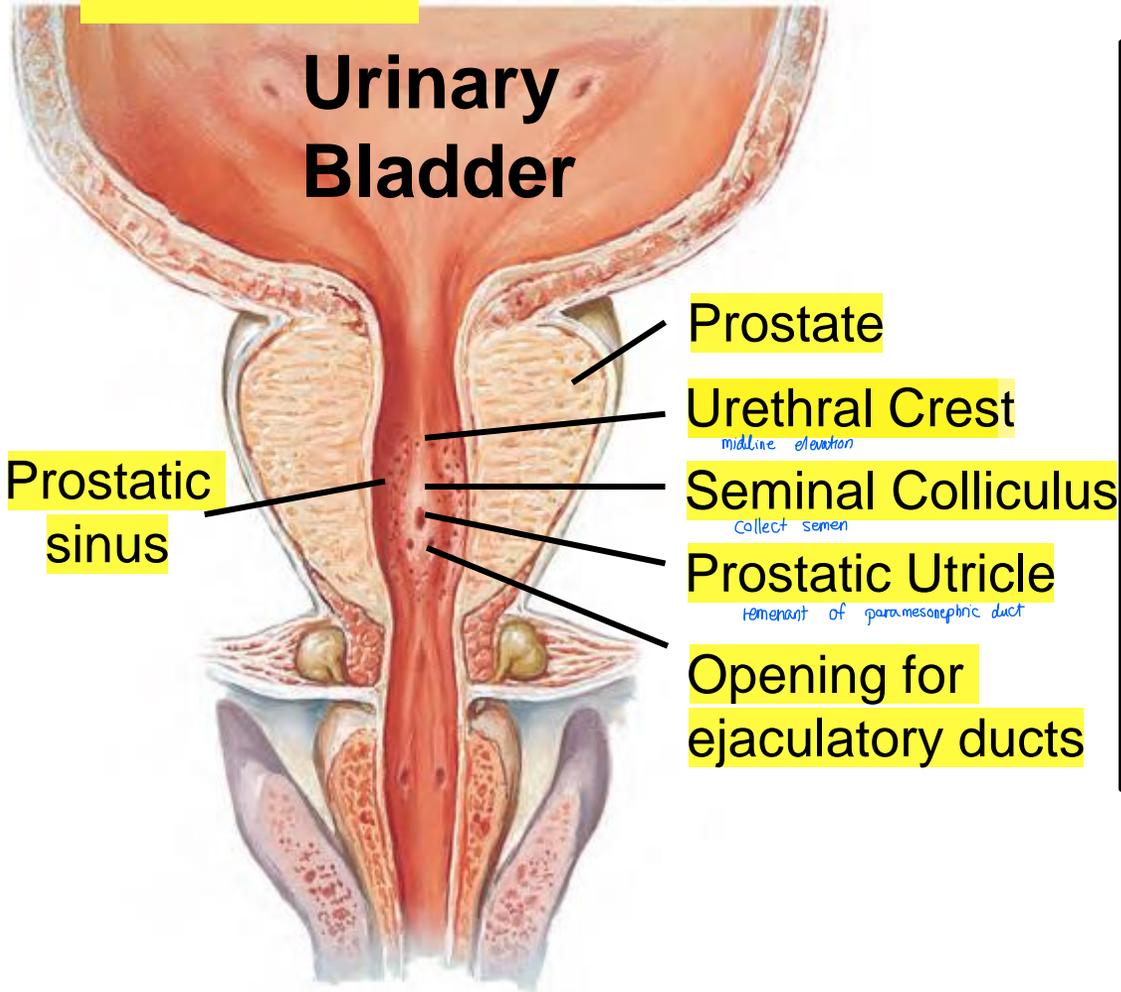


In which perineal pouch?
Deep perineal pouch

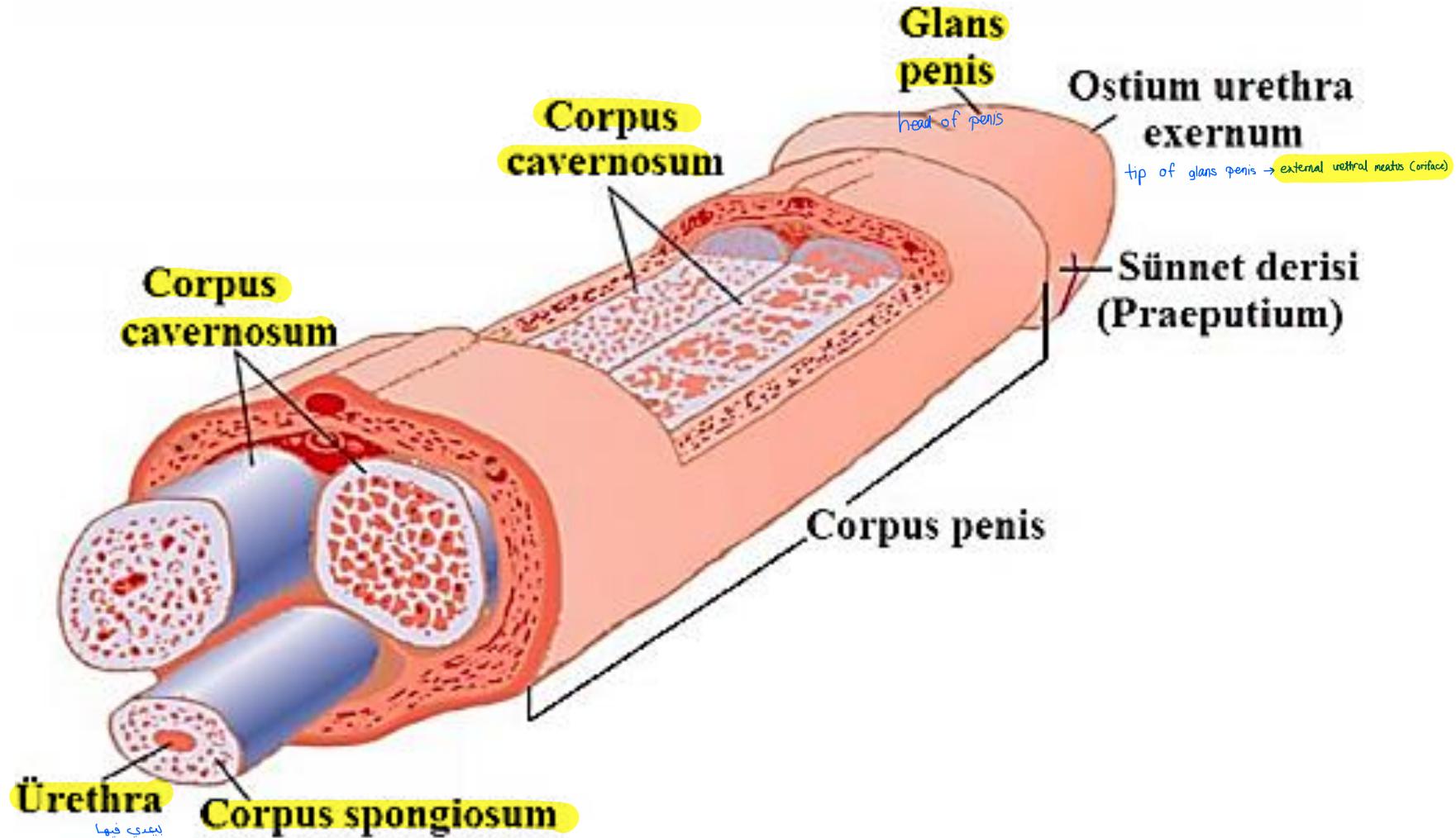
مهمة جدا

VIP

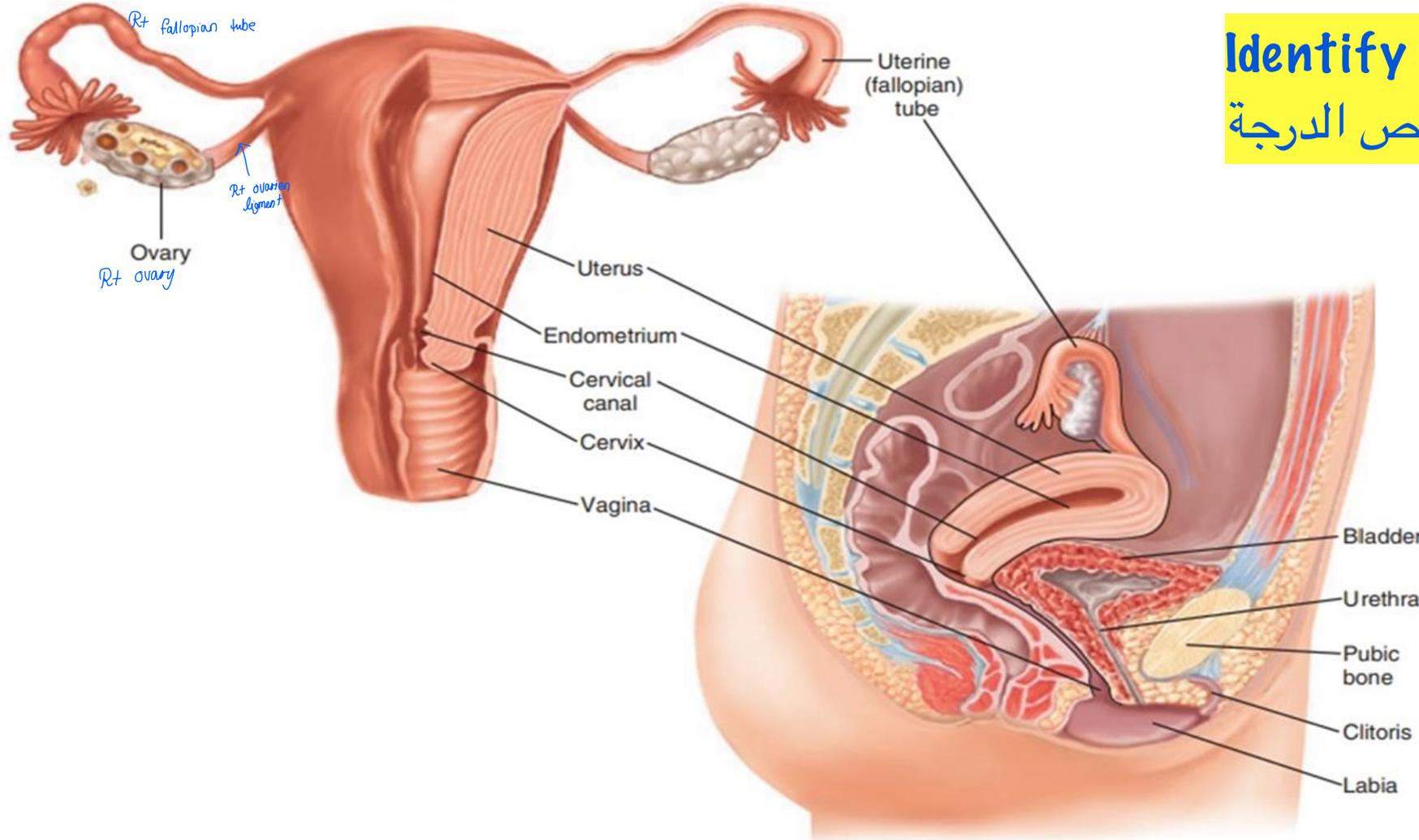
Prostate



Penis



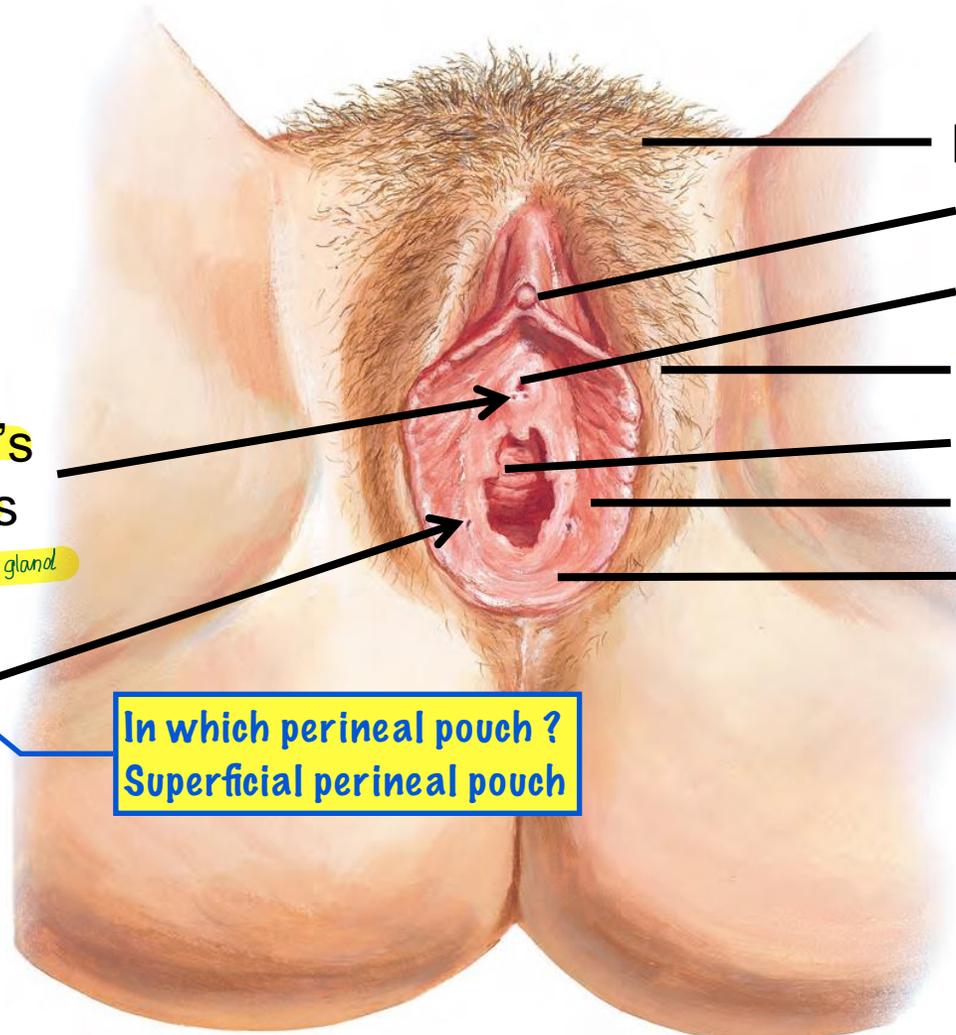
Female Genital System



Identify ?

مهم نحدد ال site عشان عليه نص الدرجة

External Genitalia (Vulva)



Mons Pubis → Hair filled area

Clitoris

Urethra

Labia Majora

Vagina

Labia Minora

Vesitbule
() 2 Labia minora

Skene's glands

= para urethral gland

Bartholin's glands

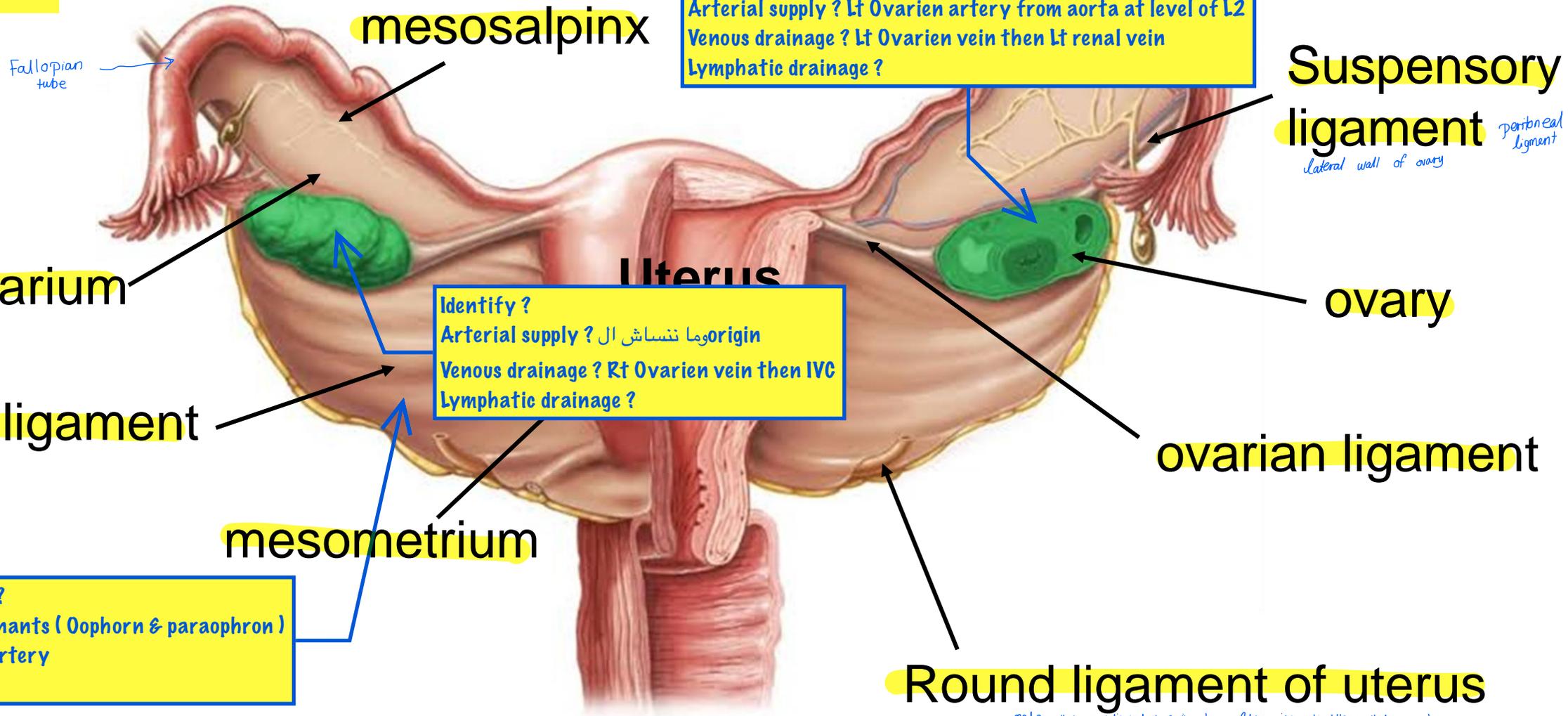
= greater vestibular gland

In which perineal pouch ?
Superficial perineal pouch

مهمة جدا
VIP



Ovaries



Identify ? Lt ovary
Arterial supply ? Lt Ovarien artery from aorta at level of L2
Venous drainage ? Lt Ovarien vein then Lt renal vein
Lymphatic drainage ?

Identify ?
Arterial supply ? الـوما تنساش الـ origin
Venous drainage ? Rt Ovarien vein then IVC
Lymphatic drainage ?

Suspensory ligament
peritoneal ligament
lateral wall of ovary

mesovarium

broad ligament

mesometrium

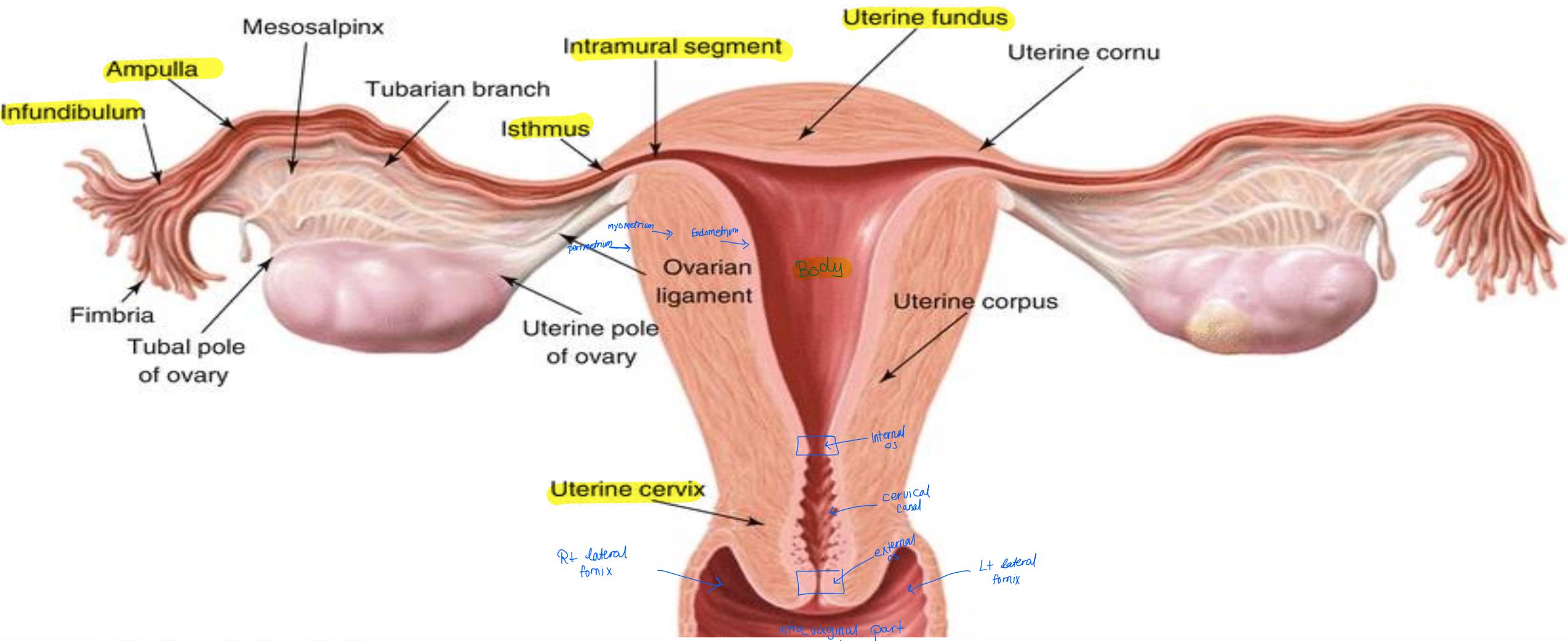
Round ligament of uterus

Mention 2 contents ?
- Empryological remenants (Oophorn & paraophron)
- Ovarien & uterine artery
- Uterine tube

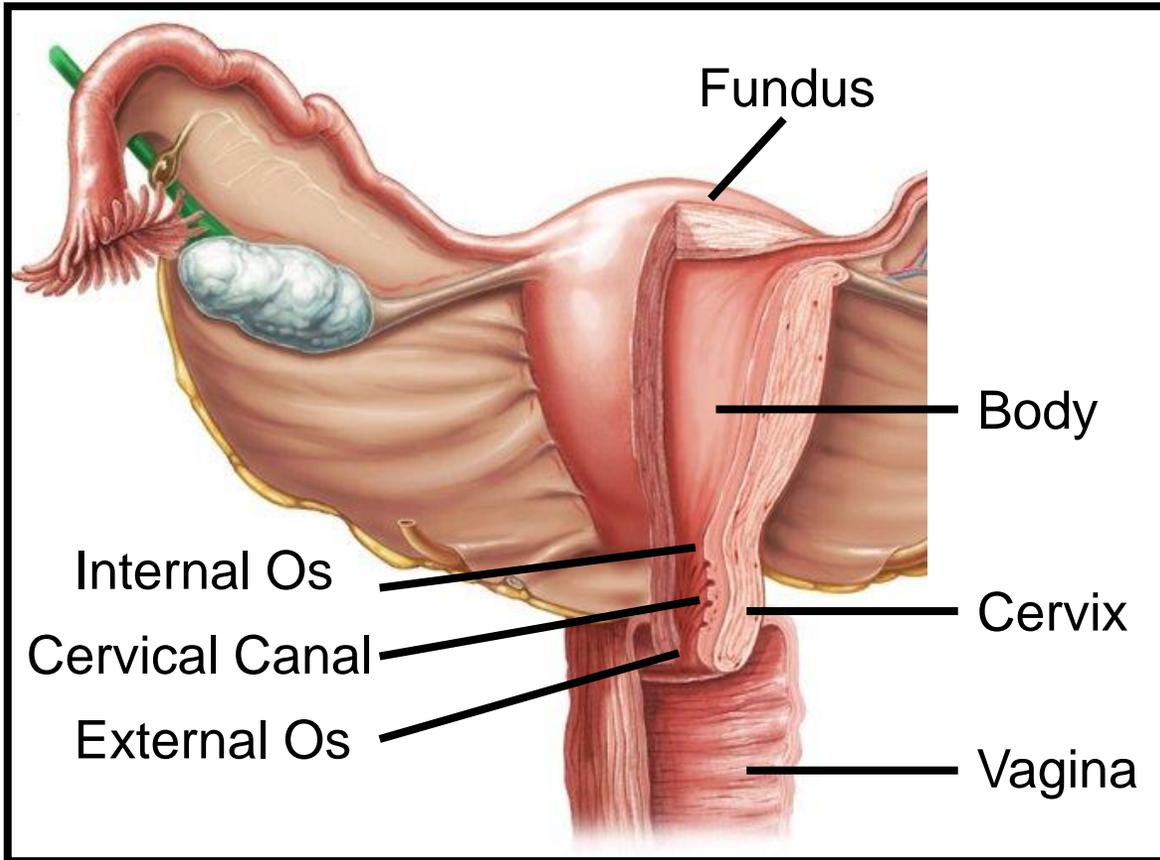
لـ يتوصل الـ Uterus بالـ Labia majora لـ شبه الـ spermatic cord في الـ male



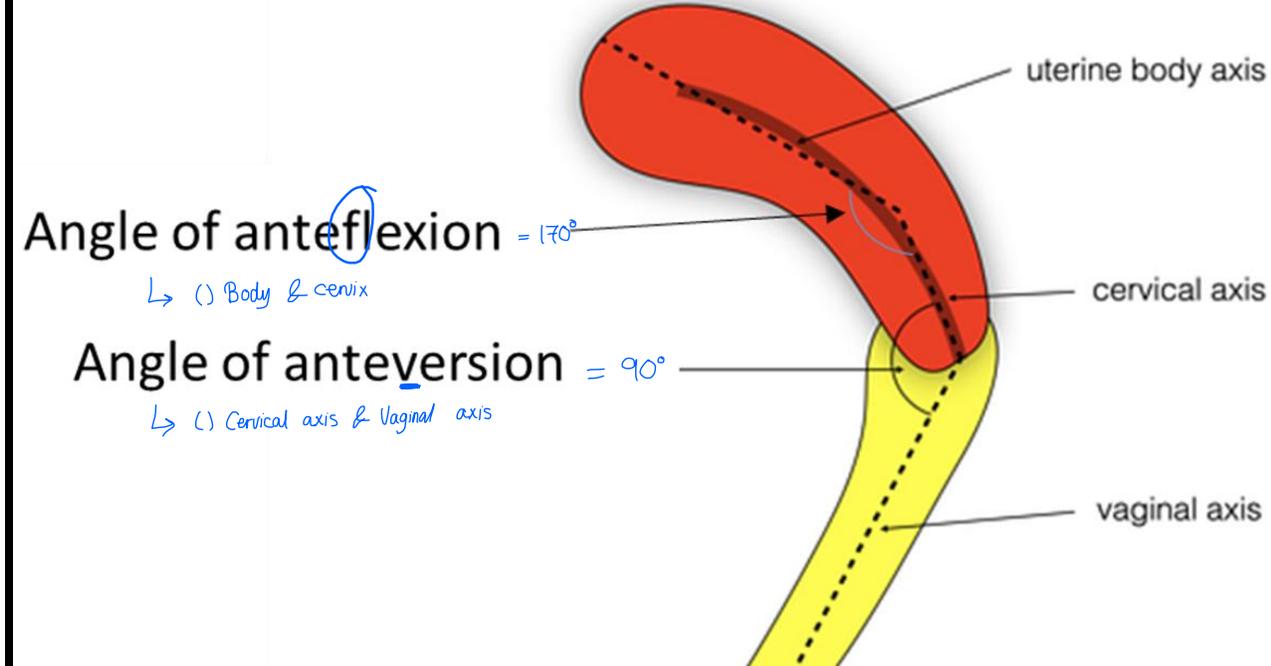
Fallopian Tubes



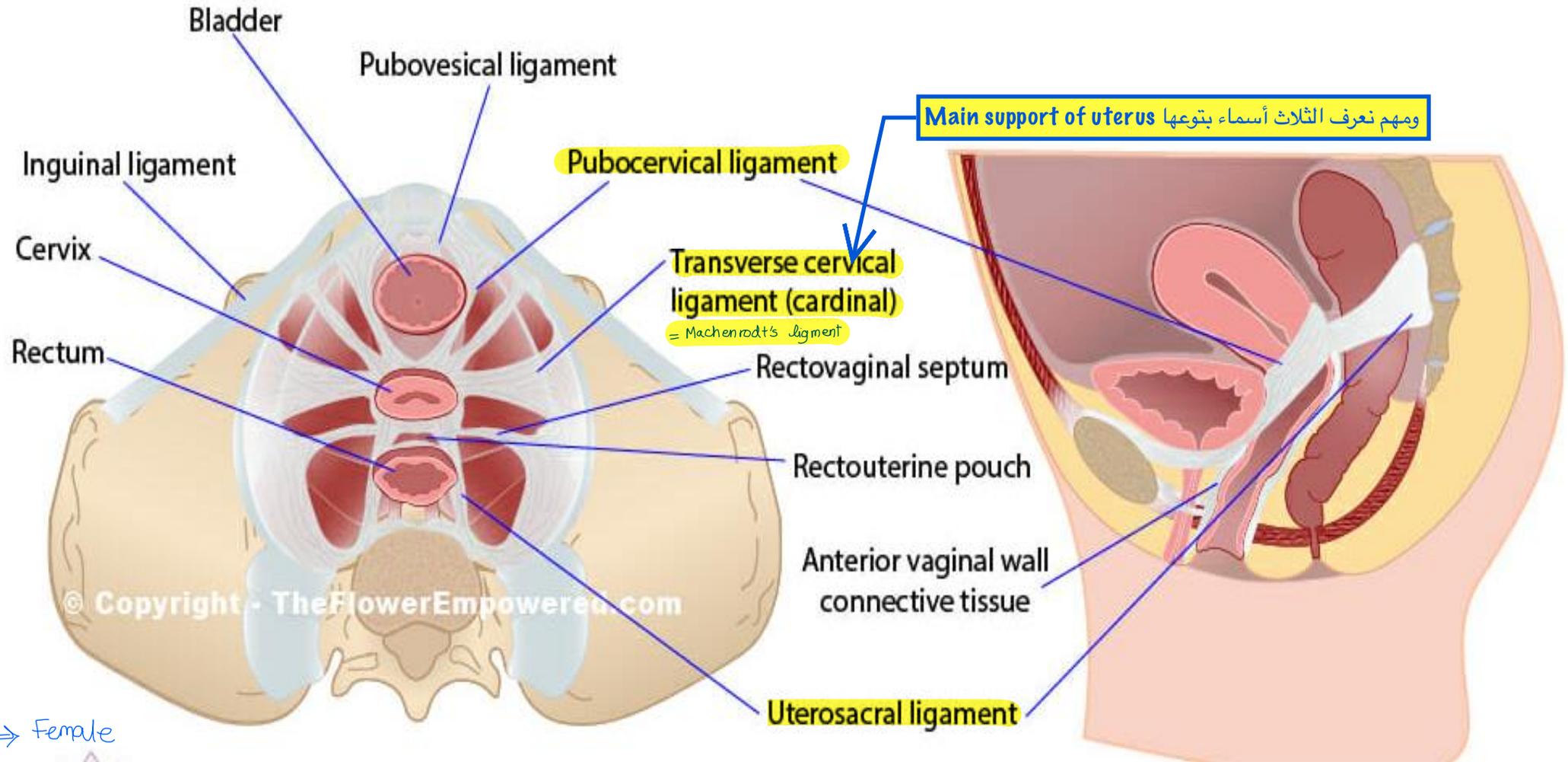
Uterus



Normal Position of the Uterus



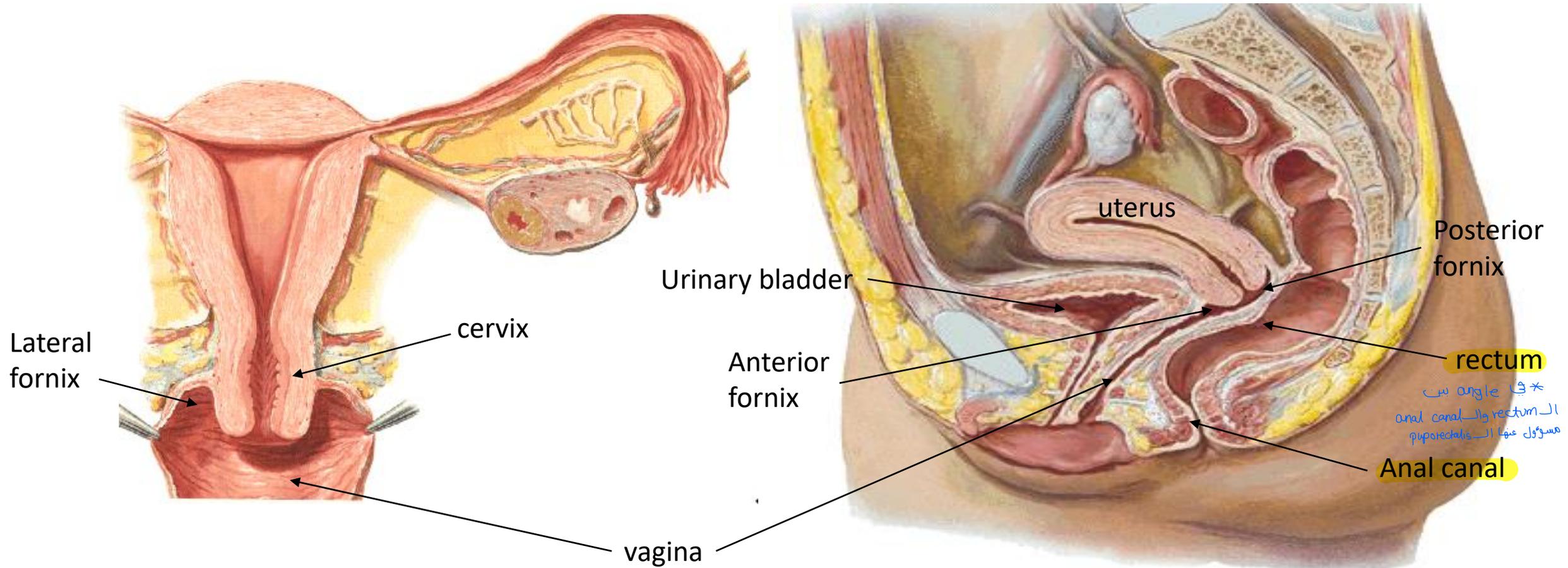
Uterus: Supporting Ligaments



3 opening ⇒ Female

OSPE : Identify اللي بالهايليت

Vagina



Lateral fornix

cervix

Urinary bladder

Anterior fornix

uterus

Posterior fornix

rectum

* في angle بين
الrectum والanal canal
مسؤول عنها ال-puporectalis

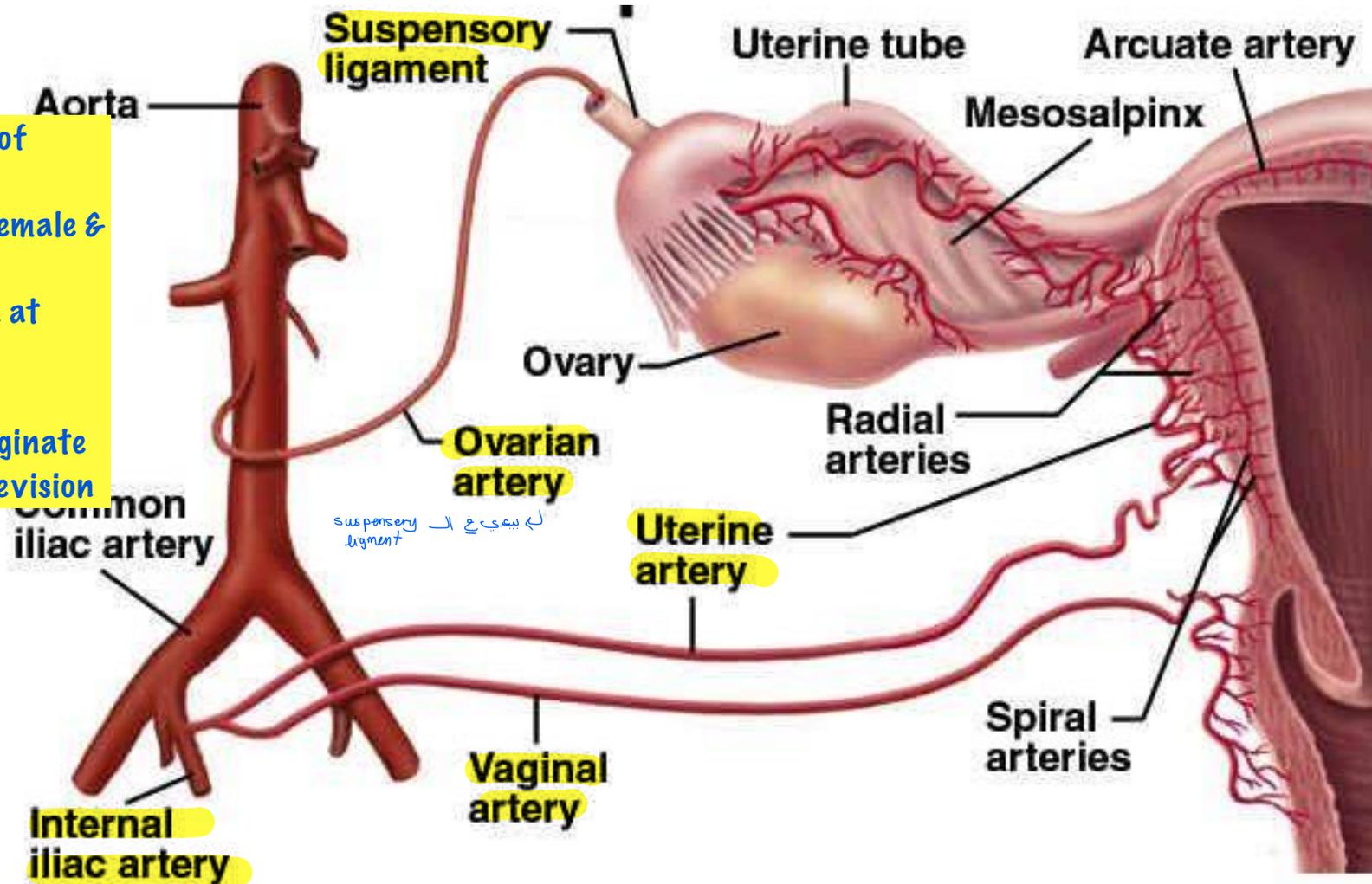
Anal canal

vagina

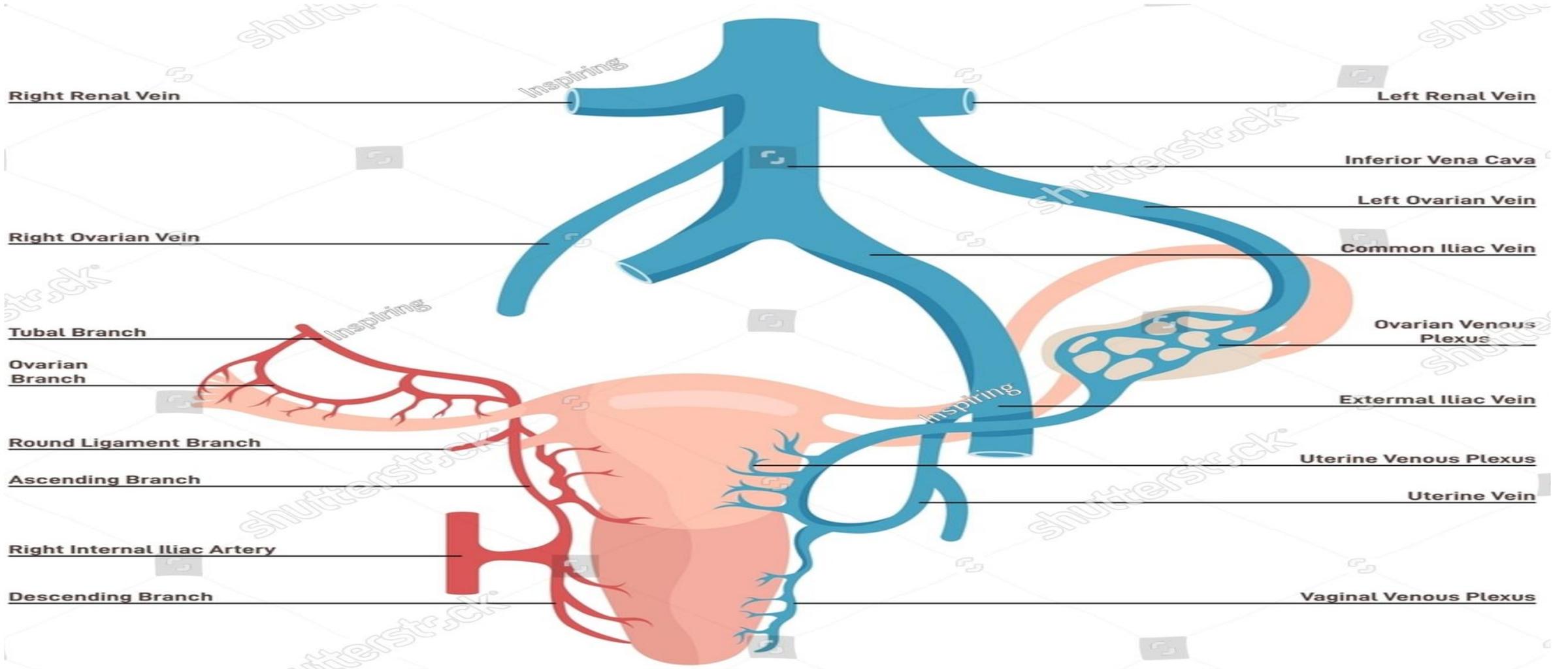
لـ يفتح في الvestibule و الurethra وقدم ال anus
* بين الvestibule وال anus فـلاق ال perineal body

Arterial Supply

- What is the arterial supply of ovary or testis ?
Gonadal artery (Ovarien in female & testicular in male)
Origin : From abdominal aorta at level of L2
- Vaginal & uterine artery originate from internal iliac anterior division



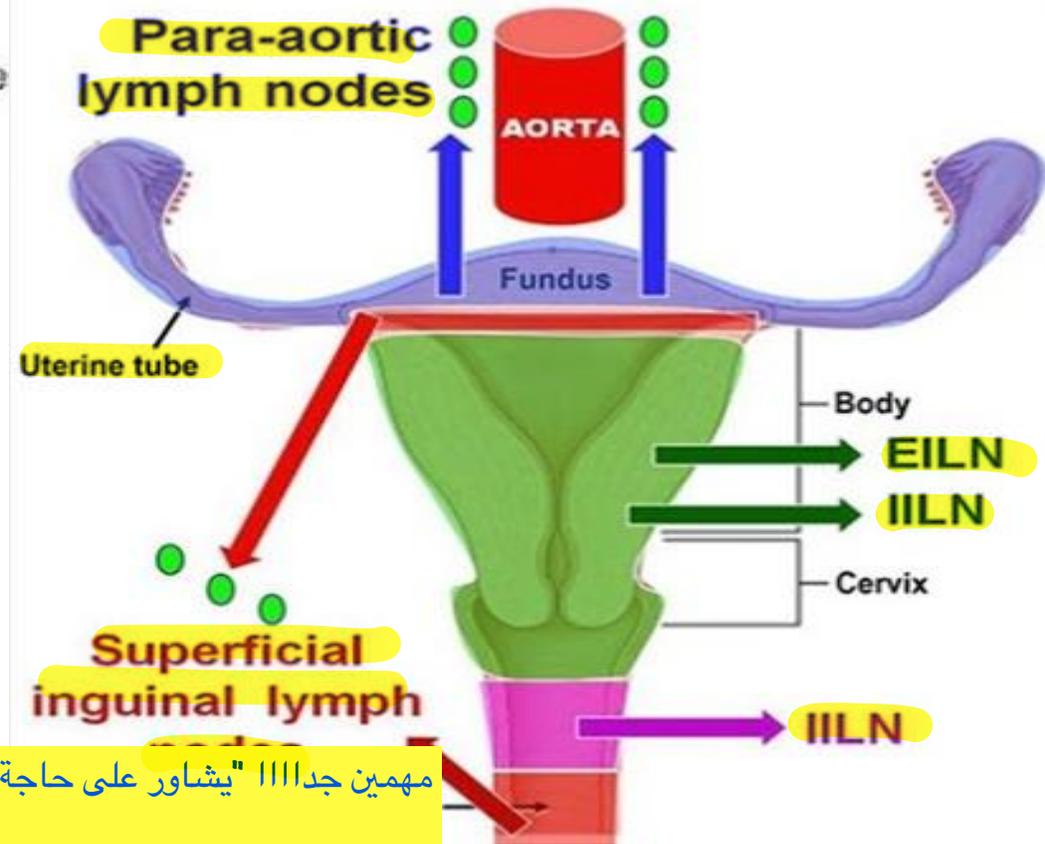
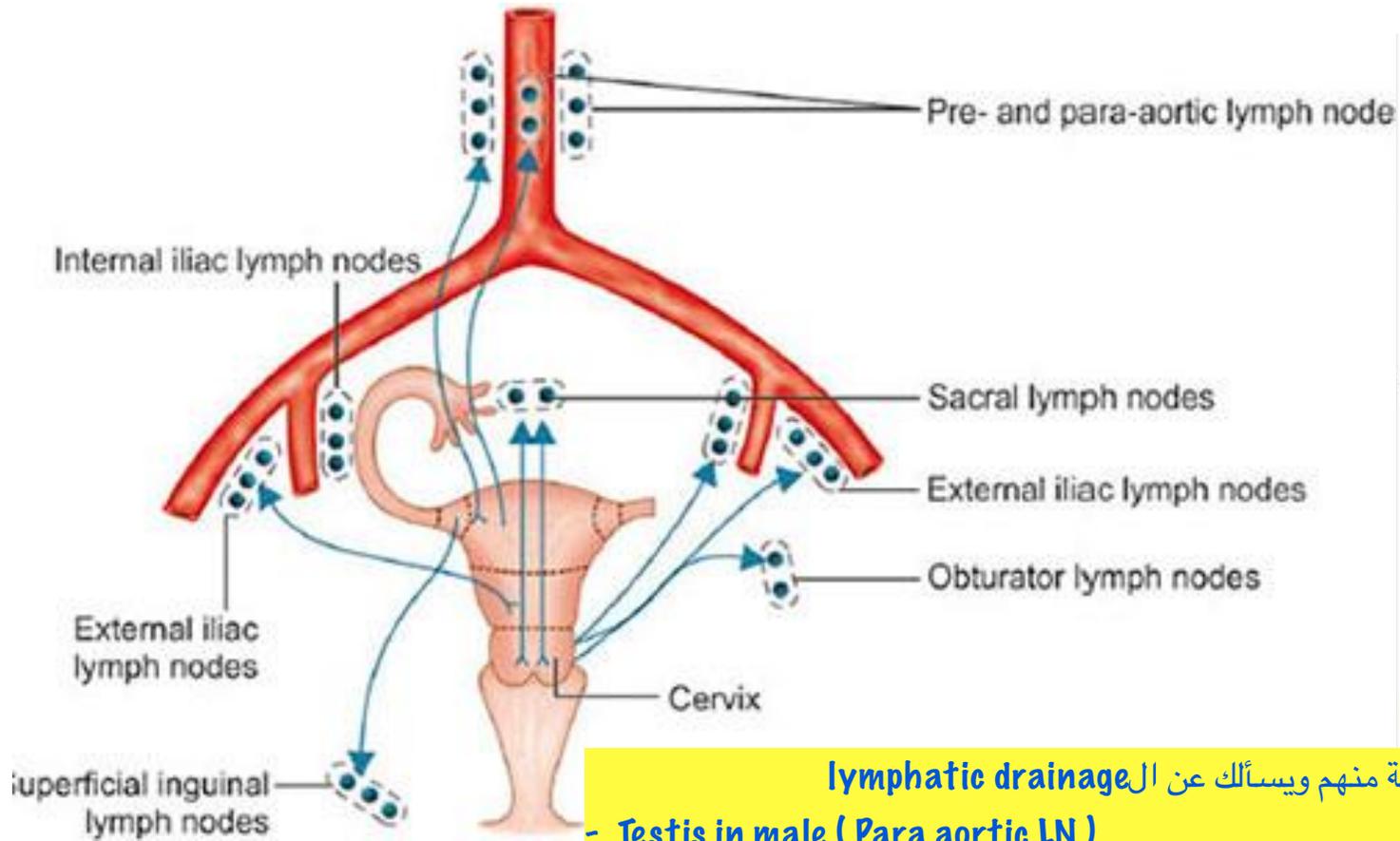
Venous Drainage



M N

أهم حاجة الـ **ovary** والـ **testis** ونميز دي شمال ولا يمين وبتودي الـ **venous drainage** فين

Lymphatic Drainage



- مهمين جدا!!! "يشاور على حاجة منهم ويسألك عن الlymphatic drainage"
- Testis in male (Para aortic LN)
 - Scrotum in male (Superficial inguinal LN)
 - Ovary - fallopians tube - Fundus of uterus (Para aortic LN)
 - Isthmus - lower third of vagina to (superficial inguinal LN)
 - Body of uterus - cervix - Upper third of vagina (External & internal iliac LN)
 - Middle third of the vagina (Internal iliac LN)

Thank You!