REVISION OF REPRODUCTIVE MODULE RESET 2025

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Gross anatomy of male reproductive system

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MALE REPRODUCTIVE TRACT

A. PRIMARY SEX ORGAN: Testis

B. ACCESSORY SEX ORGANS :

a) DUCT SYSTEM:

1. Epididymis. 2. Vas deferens.
3. Ejaculatory duct. 4. Urethra.

B) GENITAL GLANDS :

1. Prostate.
2. Seminal vesicle.
3. Bulbourethral gland.

C) EXTERNAL GENEITALIA

1. Penis. 2. Scrotum.

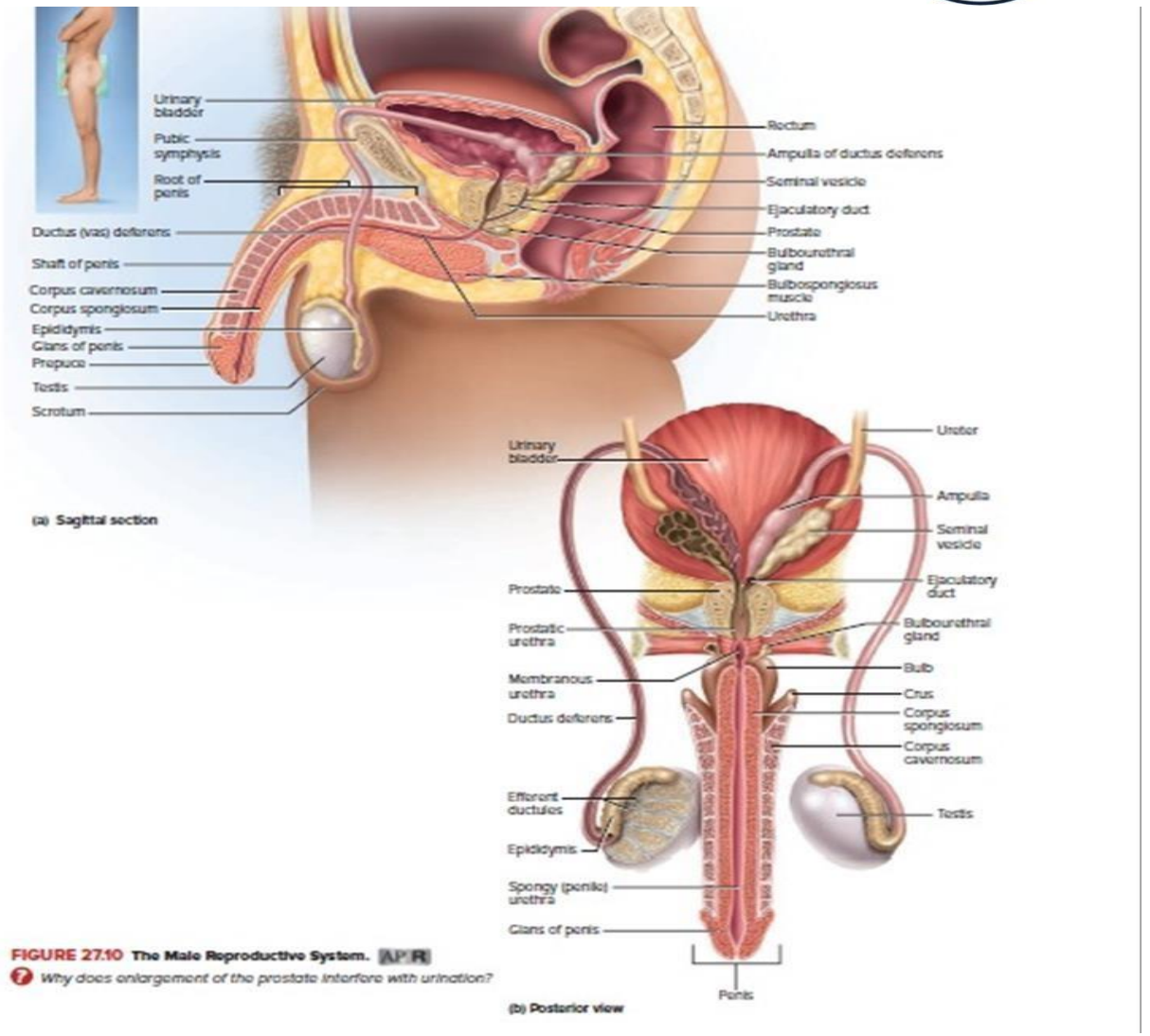


FIGURE 27.10 The Male Reproductive System. APR

Why does enlargement of the prostate interfere with urination?

I. THE TESTIS

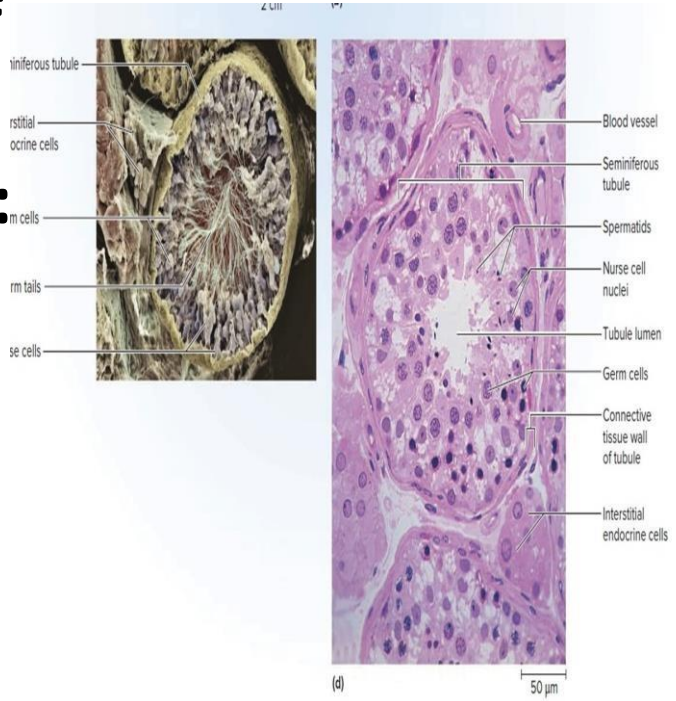
DEFINITION: It is the male primary sex organ.

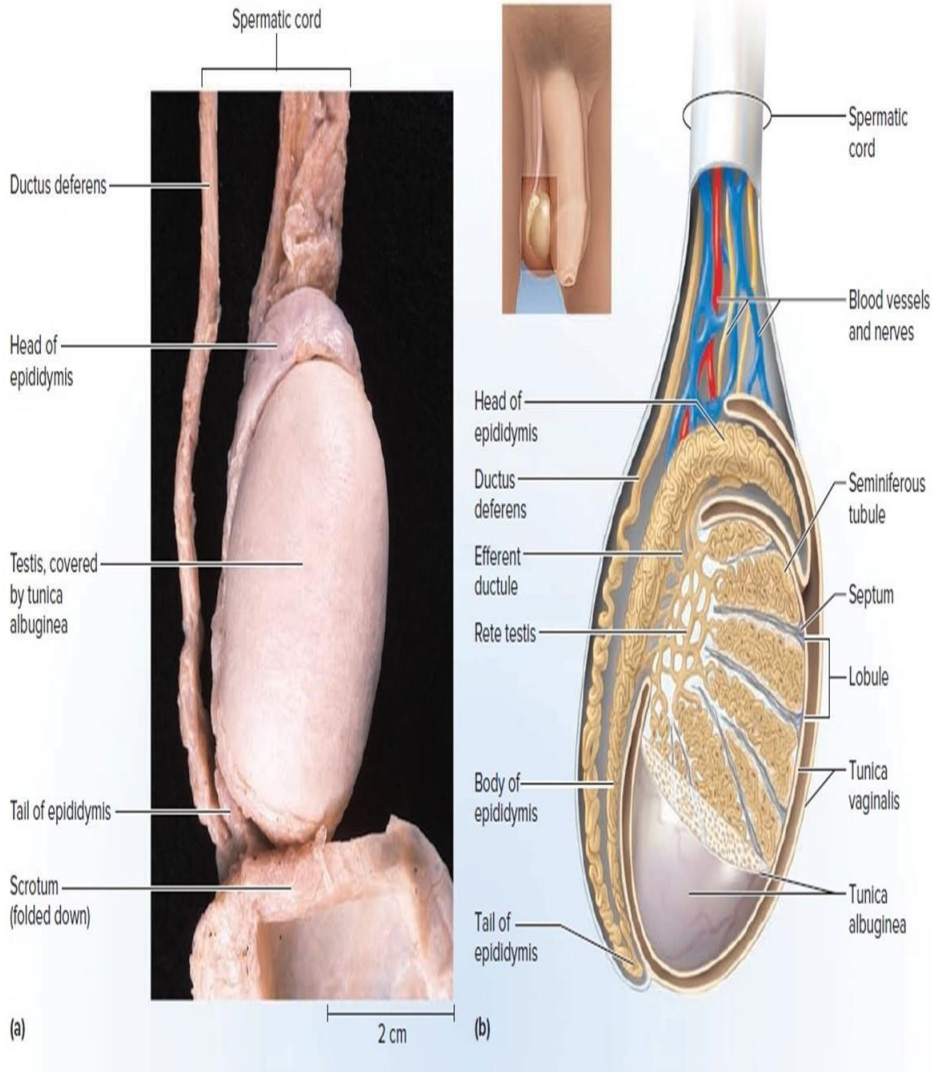
FUNCTION: production of:

a. Spermatozoa (exocrine function).

b. Testosterone hormone (endocrine function).

Location: in the scrotum suspended by spermatic cord.





I. THE TESTIS

❑ **Coverings:** each testis has the following coverings:

❑ **3 Capsules:**

a. Tunica vasculosa: it is the inner-most. It consists of a vascular plexus and loose connective tissue.

b. Tunica albuginea: fibrous layer, which thickened posteriorly to form mediastinum testis.

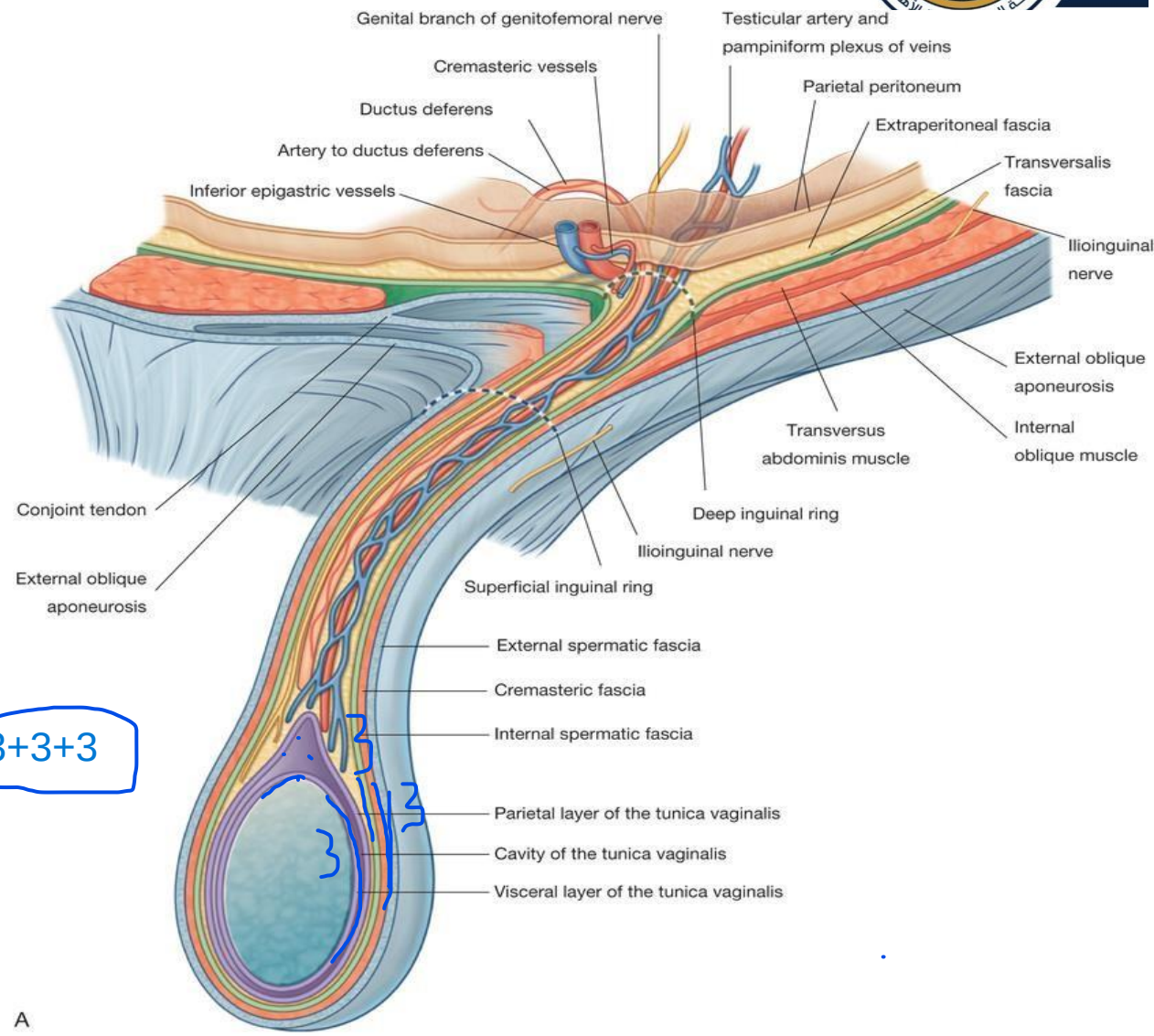
c. Tunica vaginalis: serous layer, which has visceral & parietal layers. peritoneum MCQ

❑ **3 Coats:** derived from anterior abdominal wall:

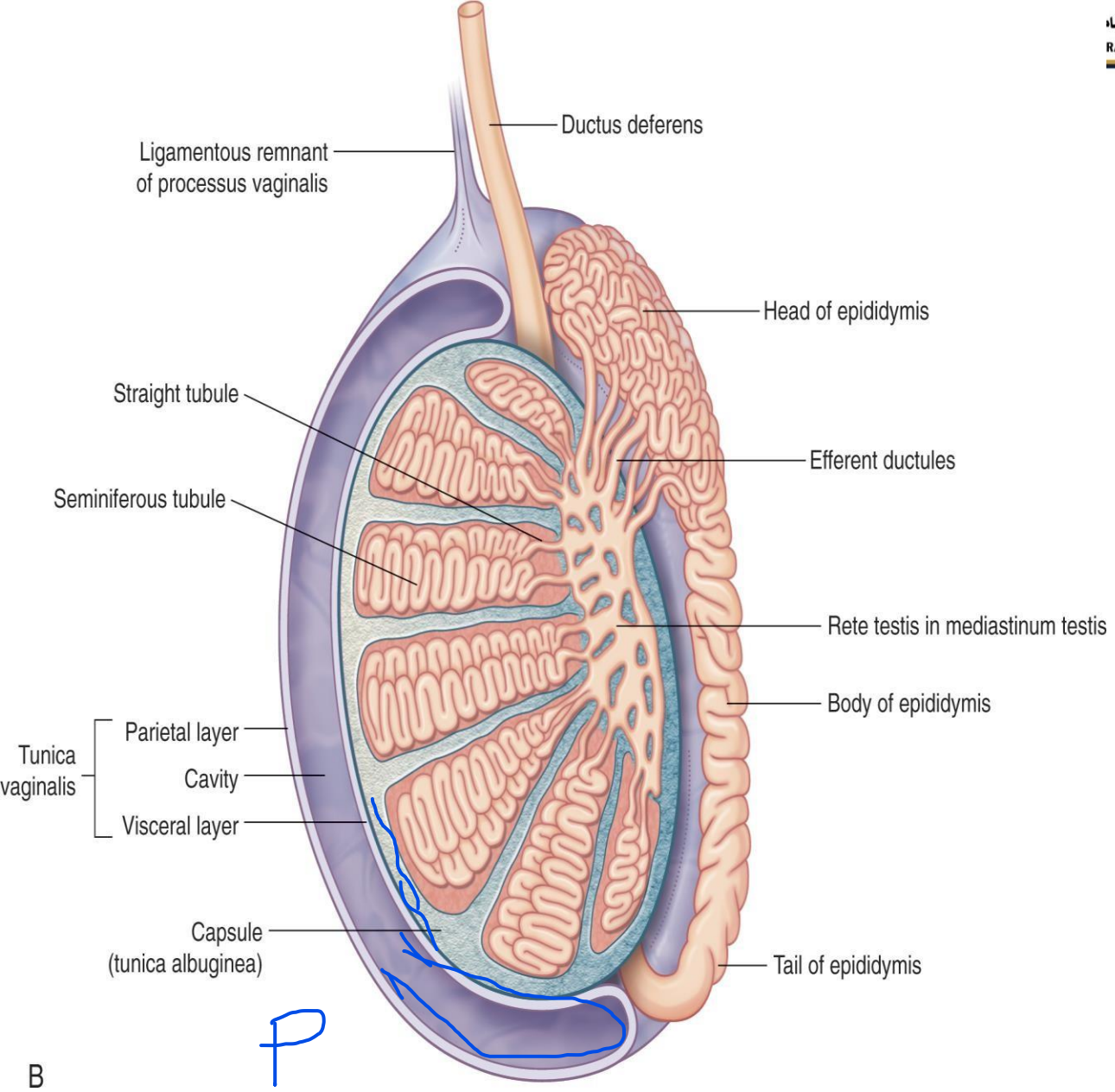
a. Internal spermatic fascia: derived from the fascia transversalis.

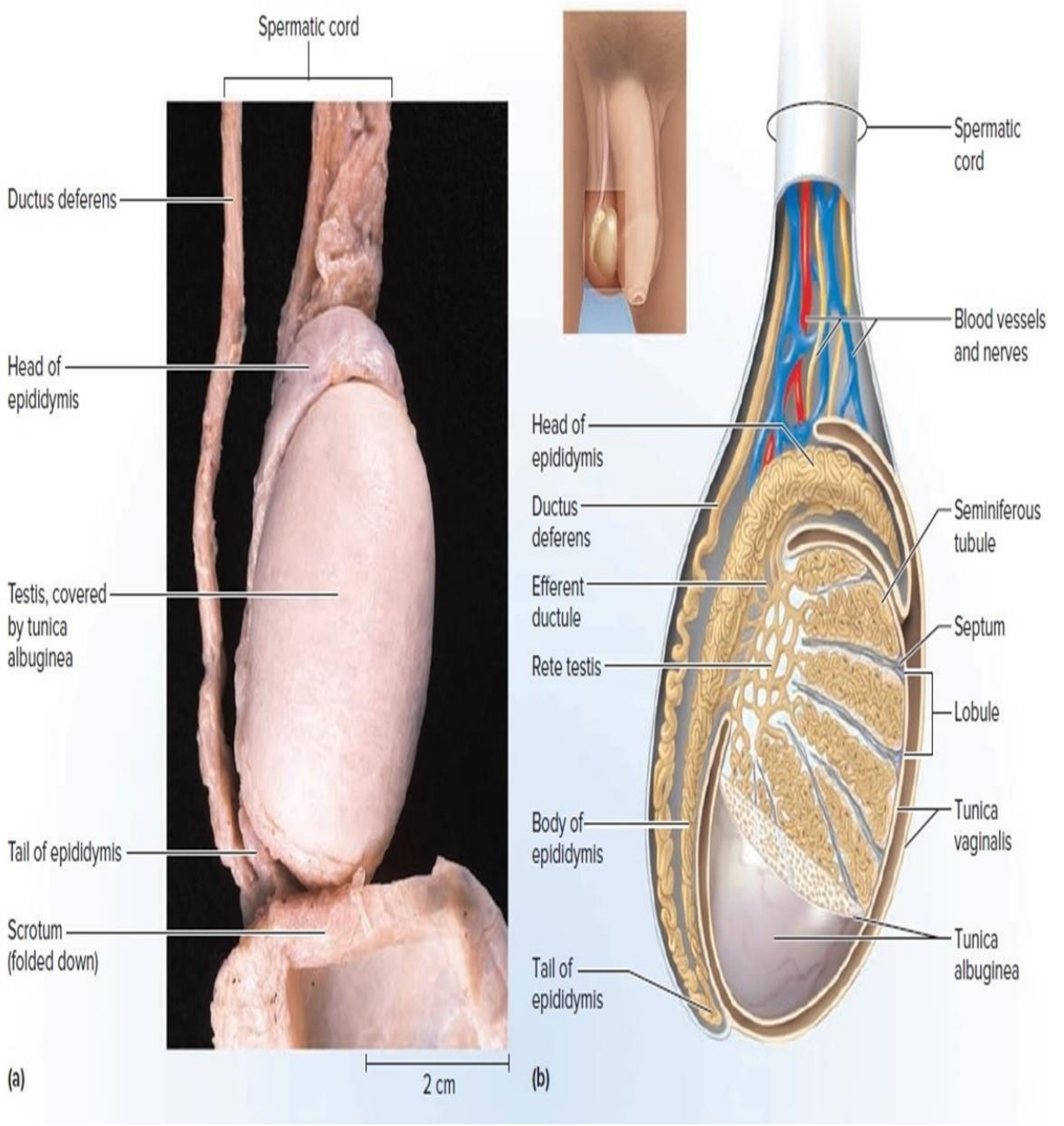
b. Cremasteric muscle and fascia: derived from the internal oblique muscle.

c. External spermatic fascia: derived from the external oblique aponeurosis.



3+3+3


Ligamentous remnant of processus vaginalis
Ductus deferens
Head of epididymis
Straight tubule
Efferent ductules
Seminiferous tubule
Rete testis in mediastinum testis
Body of epididymis
Tunica vaginalis
Parietal layer
Cavity
Visceral layer
Capsule (tunica albuginea)
Tail of epididymis
B

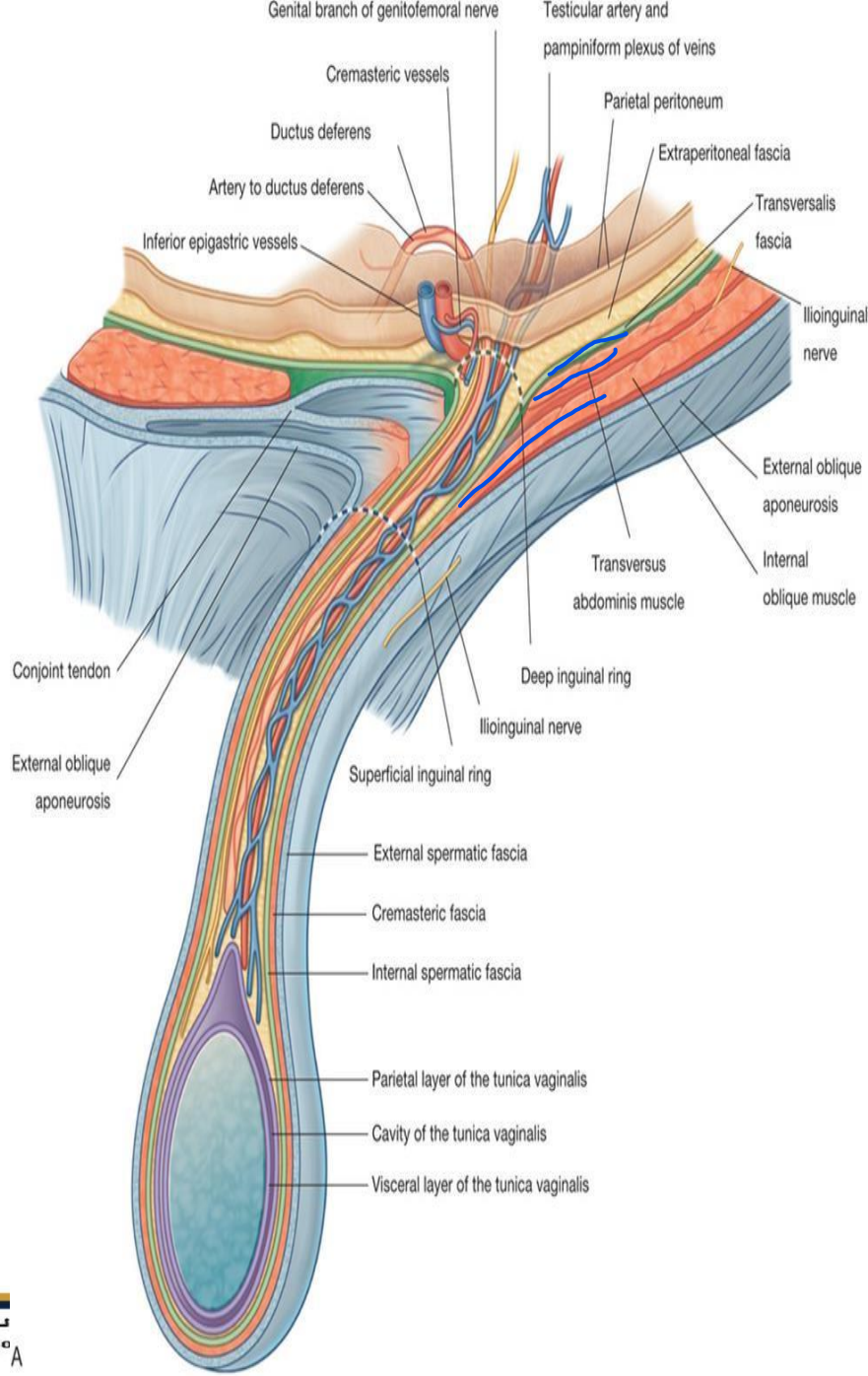

Spermatic cord
Ductus deferens
Head of epididymis
Testis, covered by tunica albuginea
Tail of epididymis
Scrotum (folded down)
2 cm
(a)
Spermatic cord
Blood vessels and nerves
Head of epididymis
Ductus deferens
Efferent ductule
Rete testis
Seminiferous tubule
Septum
Lobule
Body of epididymis
Tunica vaginalis
Tunica albuginea
Tail of epididymis
(b)

I. THE TESTIS

❖ Arrangement of the coverings of the testis (From outside inwards):

SAQ

1. Skin of the scrotum.
2. Dartos muscle.
3. Colle's fascia.
4. External spermatic fascia.
5. Cremasteric muscle & fascia.
6. Internal spermatic fascia.
7. Tunica vaginalis: 2 layers (parietal & visceral layers).
8. Tunica albuginea (fibrous capsule).
9. Tunica vasculosa.

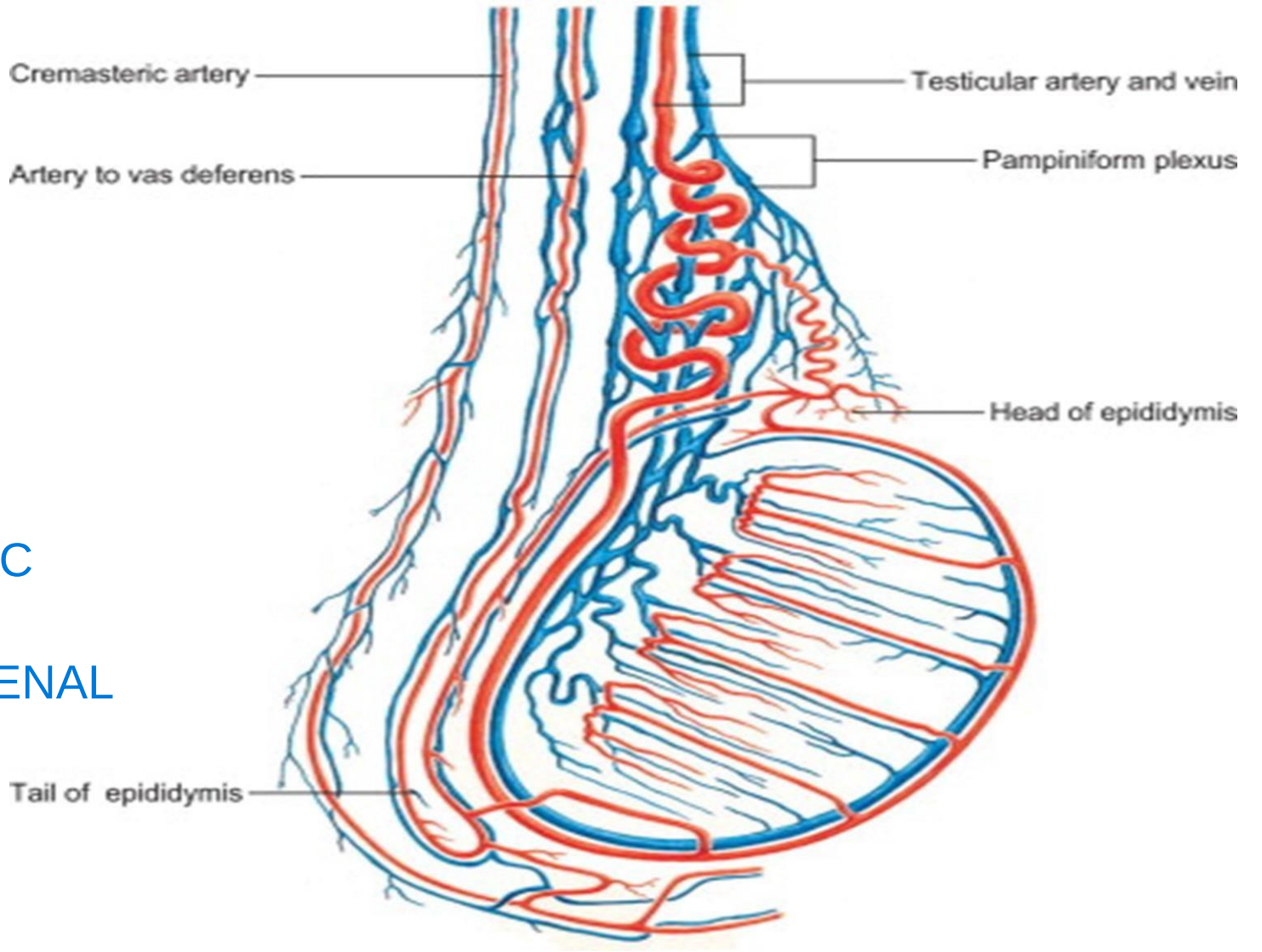


I. THE TESTIS

Blood supply of the testis:

- **Arterial supply: testicular artery:** it is a branch from abdominal aorta at the level of the **2nd lumbar vertebra.** MCQ
- **Venous drainage:** pampiniform plexus of veins which end in a **testicular vein** that terminates in:
  - **The right side** into the **inferior vena cava.** IVC
  - **The left side** into the **left renal vein.** RENAL

The lymph drainage: lumbar or paraaortic lymph nodes at the level of the **first lumbar vertebra.**



THE SPERMATIC CORD

Definition: The spermatic cord is a collection of structures that pass through the inguinal canal **to and from the testis.**

Coverings: it is covered **with 3 concentric layers** of fascia derived from the layers of the anterior abdominal wall.

Structures of the spermatic cord:

SAQ: COMPONENTS

1. Vas (ductus) deferens
2. Testicular artery
3. Testicular vein (pampiniform plexus)
4. Testicular nerve (autonomic)
5. Testicular lymph vessels
6. Remains of processus vaginalis

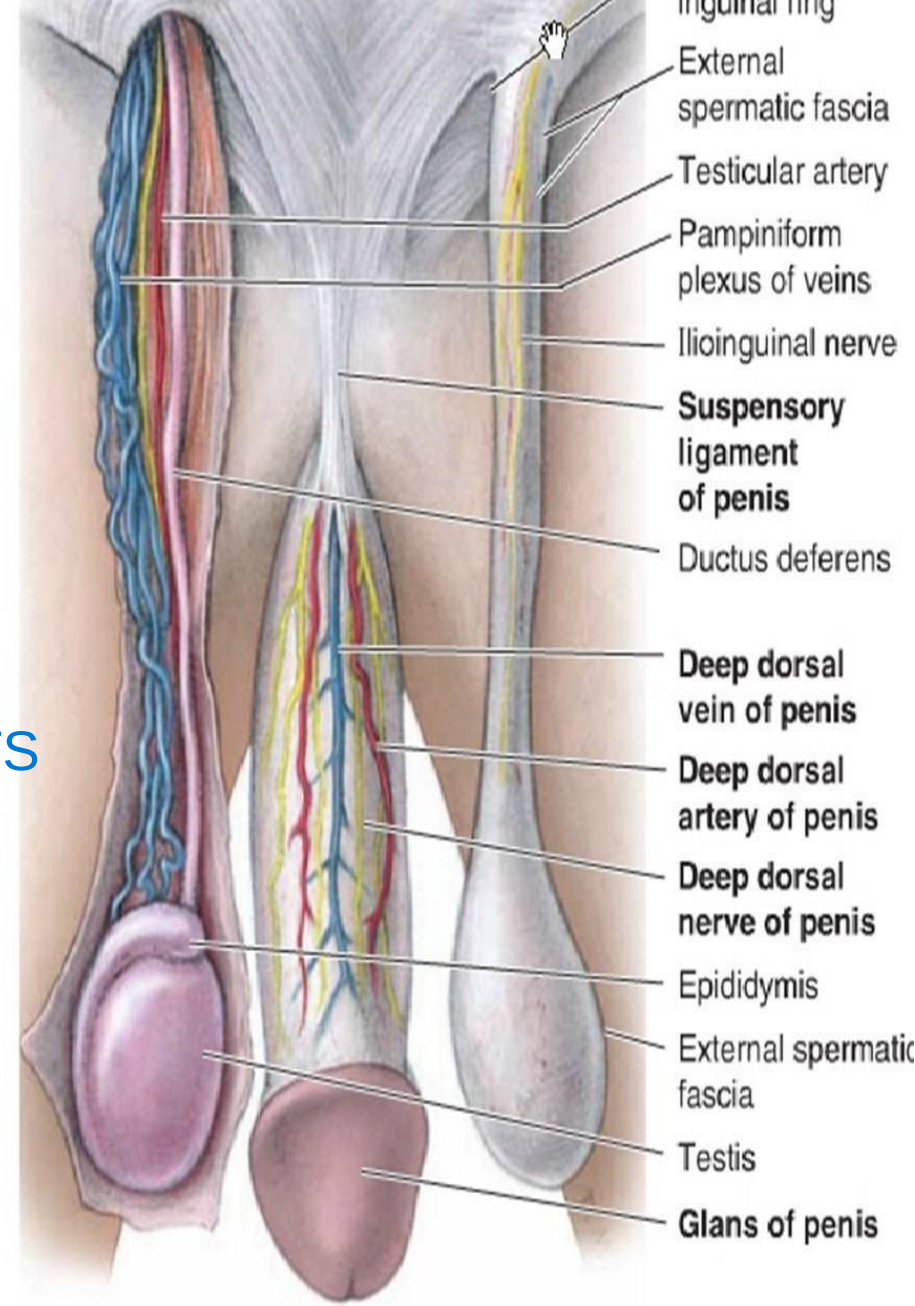


FIGURE 3.63. Vessels and nerves on dorsum of penis and contents of spermatic cord. The skin of the penis and scrotum has been removed. The

II. GENITAL DUCTS

They act as passages and storage for the sperms.

They include:

A. Tubuli recti.

B. Rete testis.

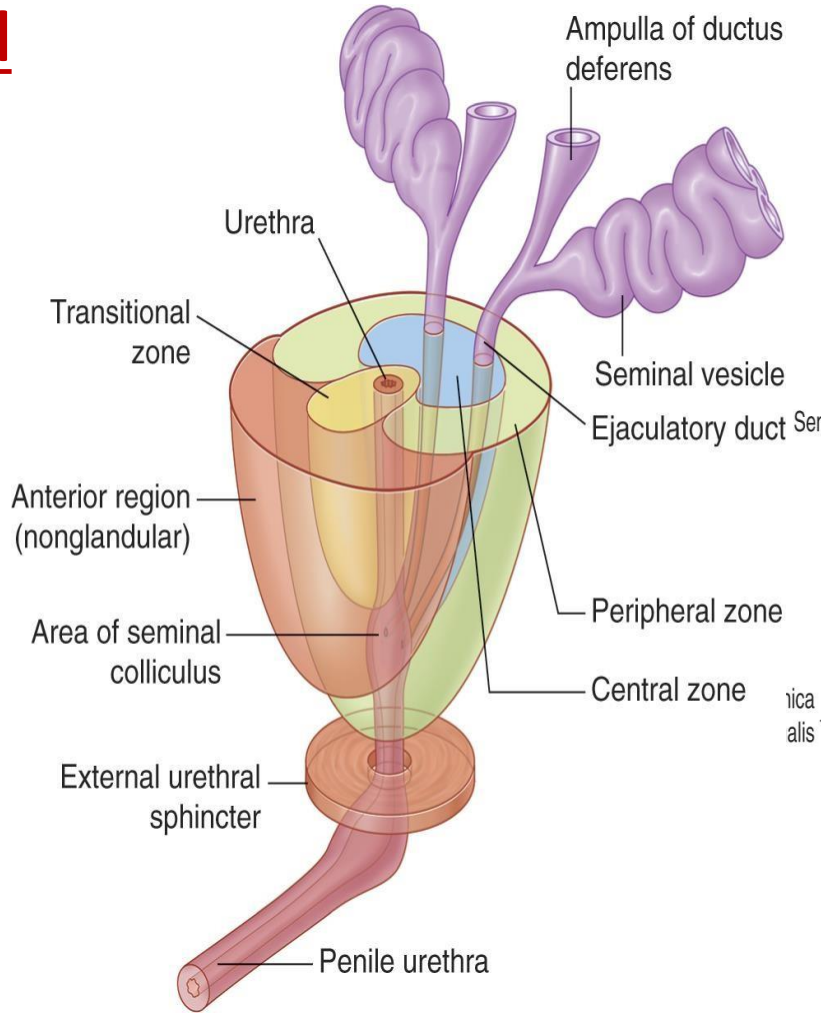
C. Efferent ductules.

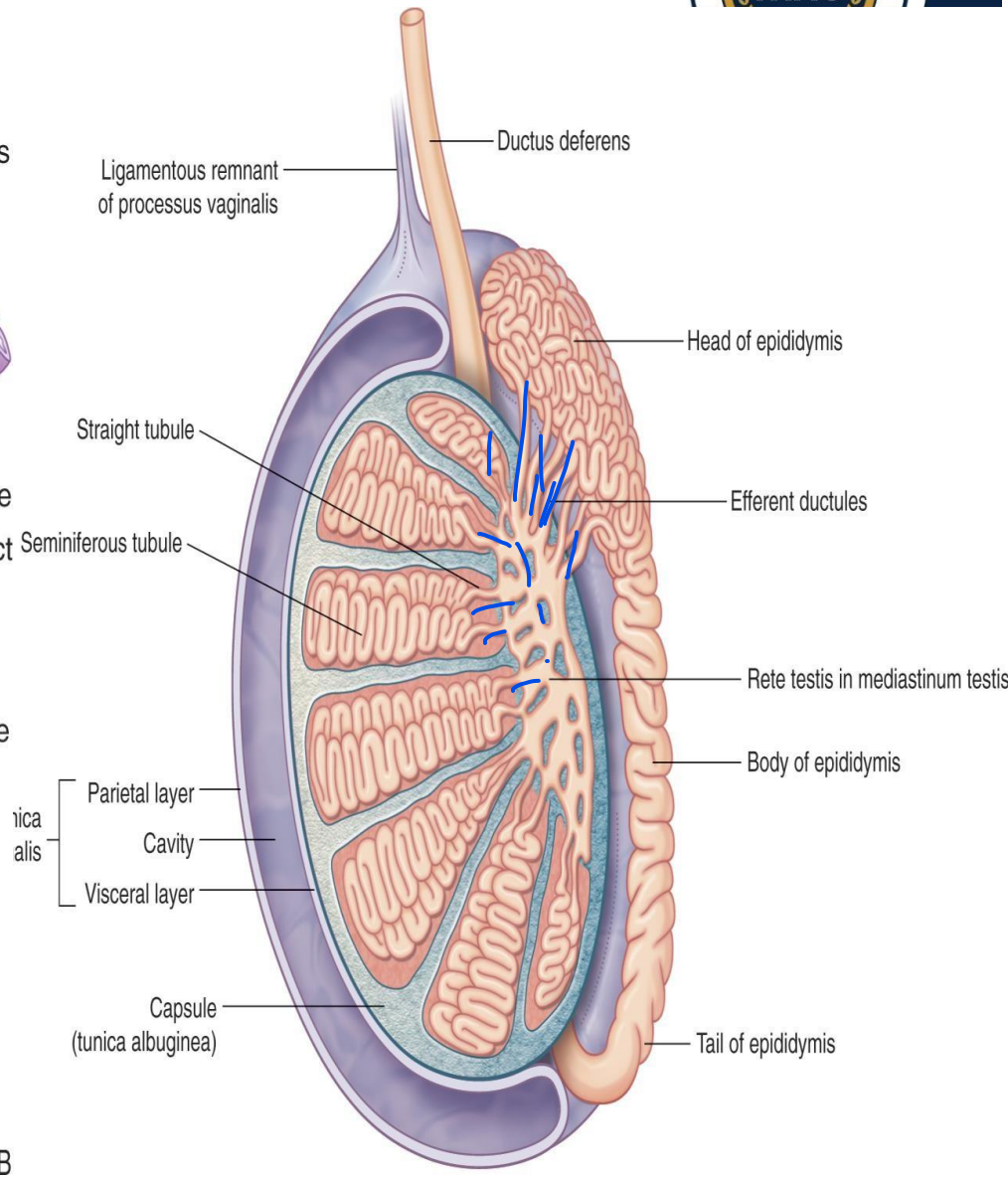
D. Duct of epididymis

E. Vas deferens

F. Ejaculatory ducts

G. Urethra





B

A. THE EPIDIDYMIS

Definition: It is a highly coiled tube (6 meters)

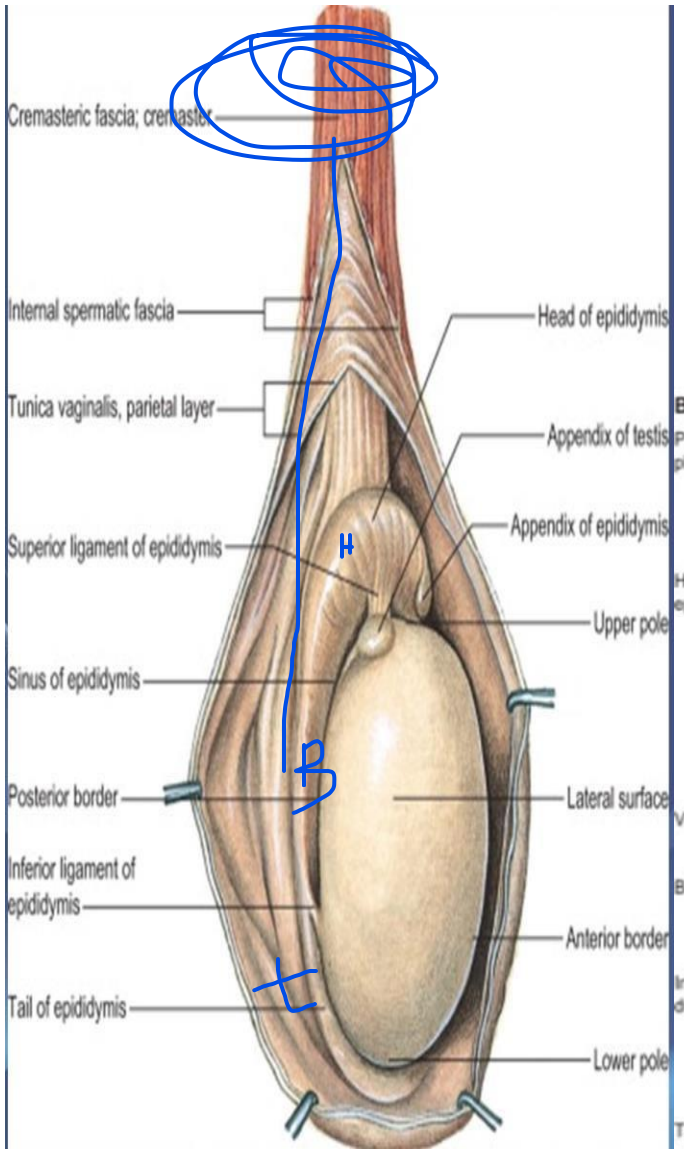
Shape: forms a comma-shaped structure in relation to the posterior part of testis.

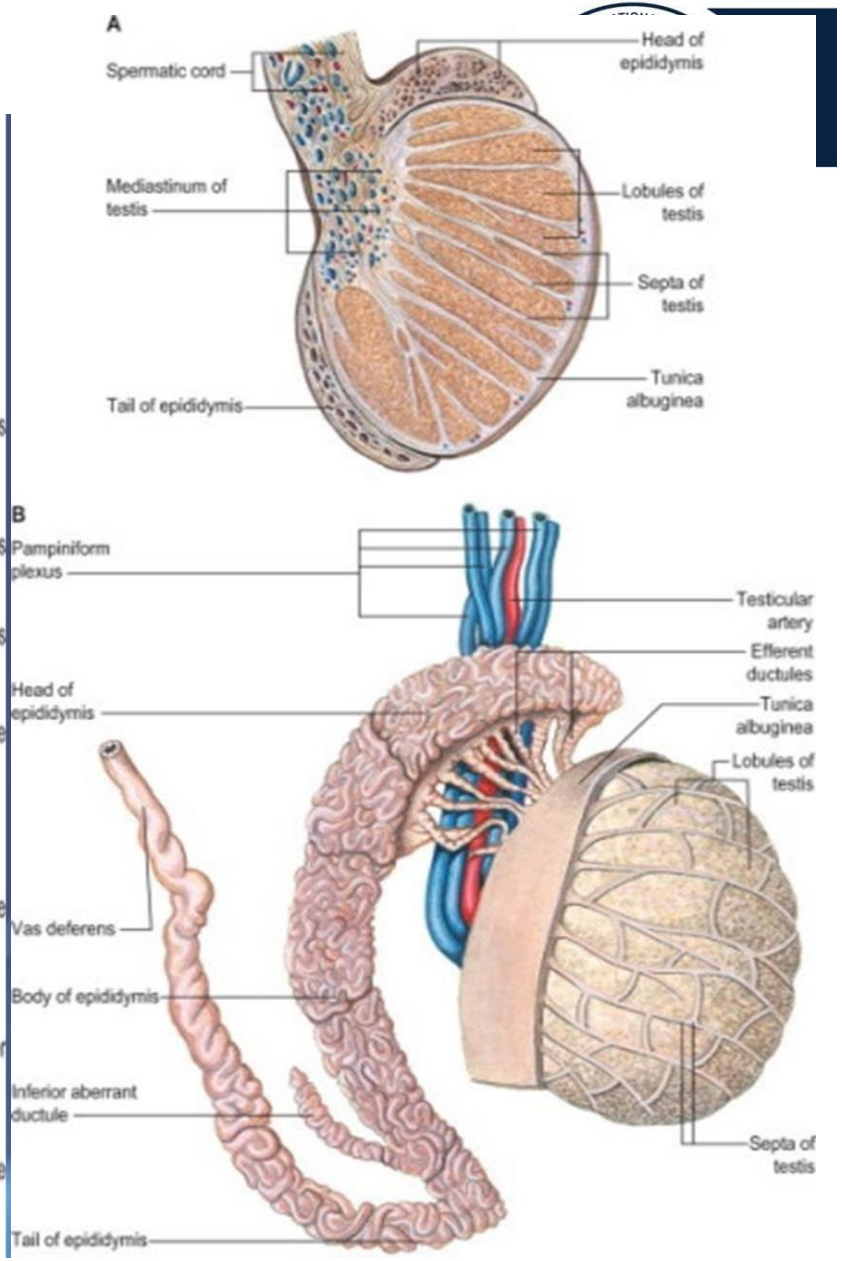
It is formed of:

A. Head: the upper part that forms a cap around the upper pole of the testis.

B. Body: the middle part behind the testis.

C. Tail: the lower part which is continuous with the vas deferens.





B. THE VAS DEFERENS

Definition:

It is a cord like structure (45 cm) with thickmuscular wall.

Shape: It begins in the scrotum as a continuation of the tail of the epididymis behind the testis.

- ❖ It ascends in the spermatic cord to enter the inguinal canal
- ❖ At the deep inguinal ring, it hooks around the lateral side of the inferior epigastric artery to enter the pelvis.
- ❖ Then, it passes on the side wall of pelvis crossing the following from above down:

A. External iliac vessels. B. Umbilical artery.

C. Obturator nerve & vessels.

- ❖ Then, it passes medially crossing over the ureter and descends behind the base of urinary bladder medial to seminal vesicle where it forms the ampulla of vas.
- ❖ It ends by joining the duct of seminal vesicle to form ejaculatory duct.

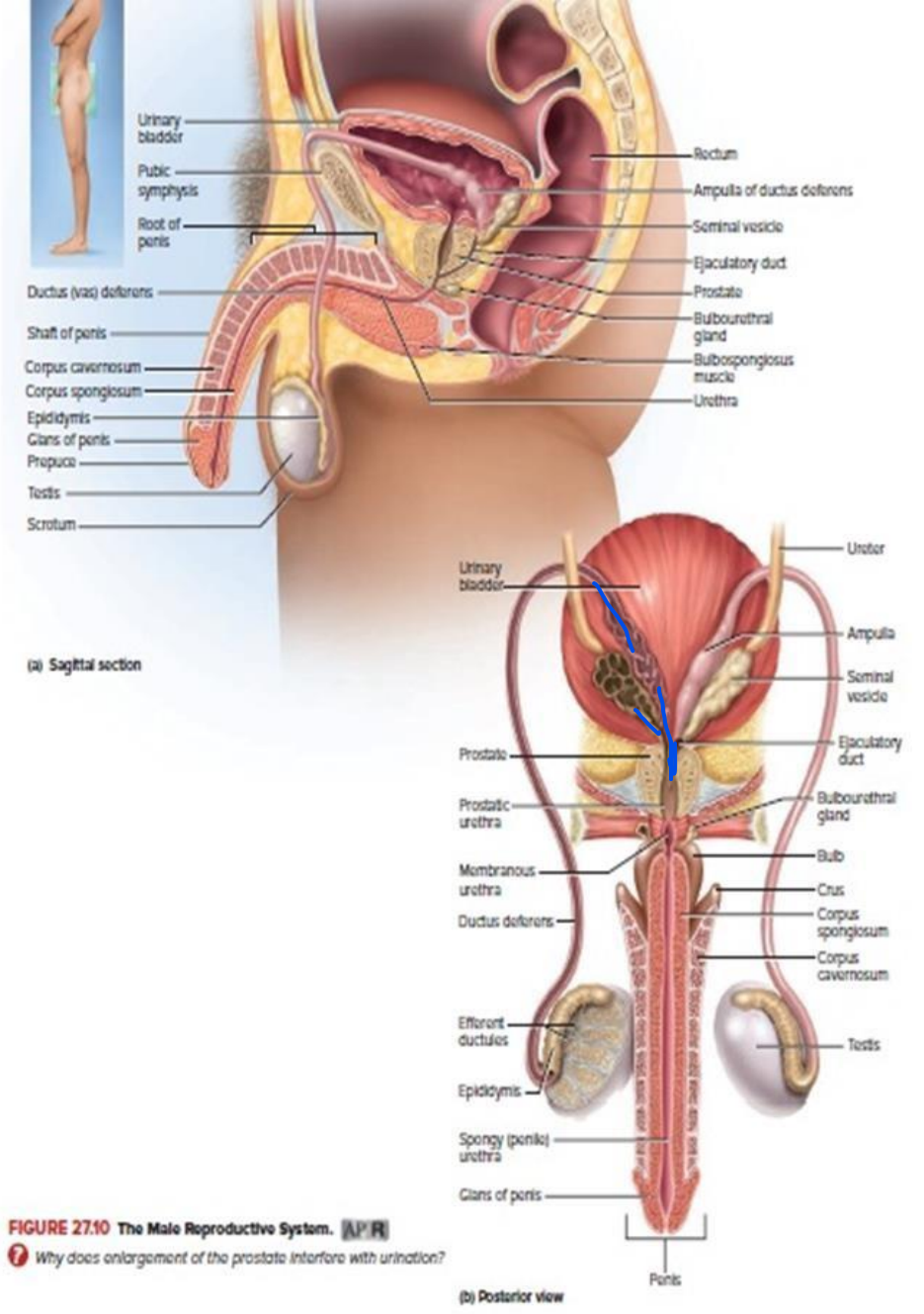
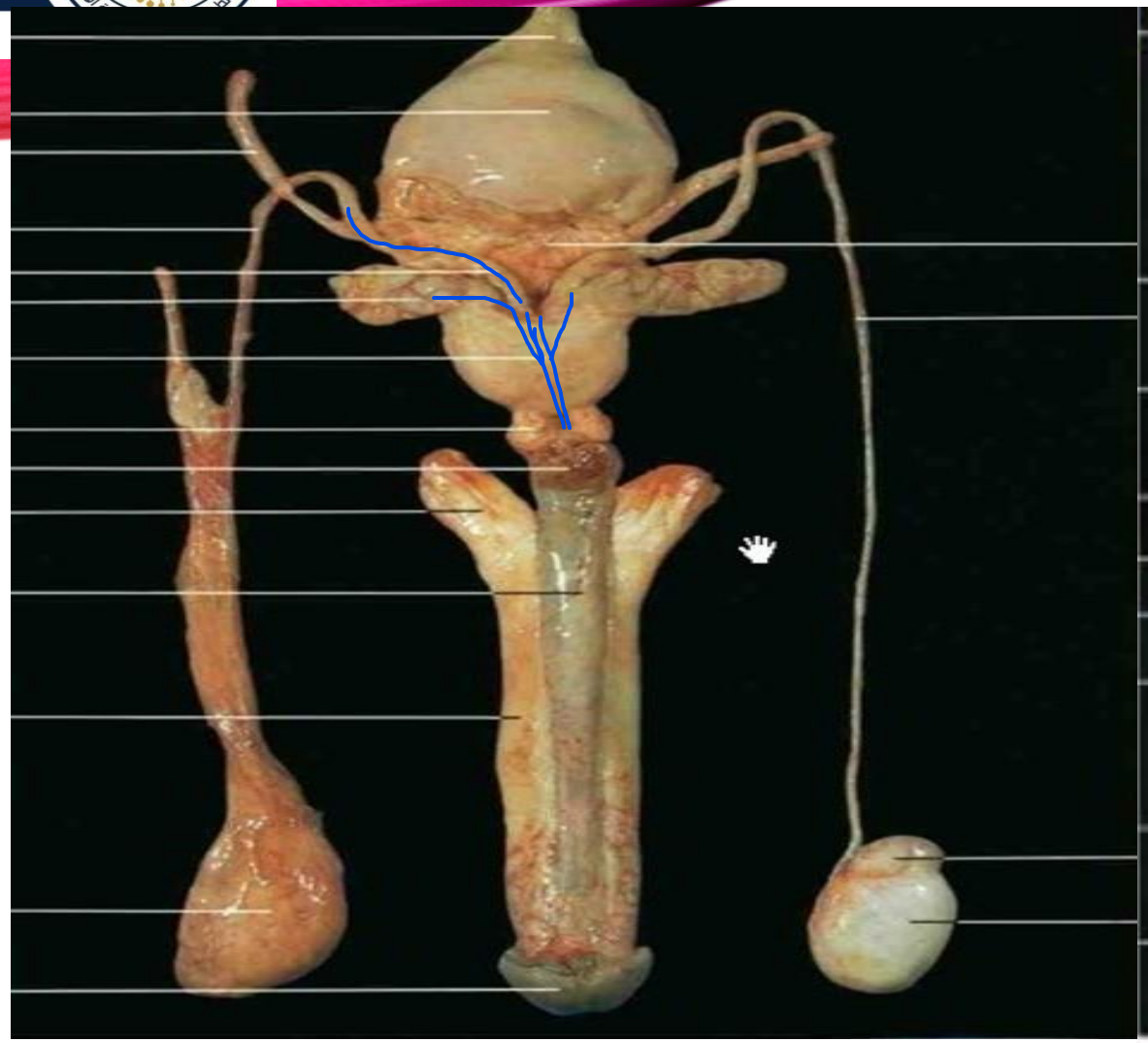
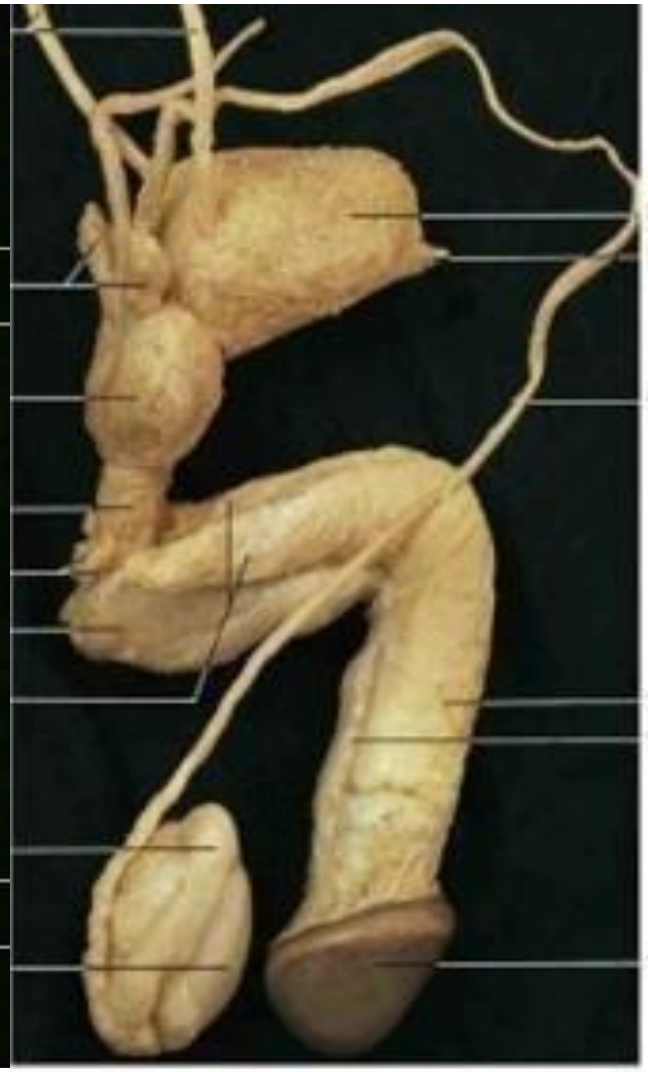


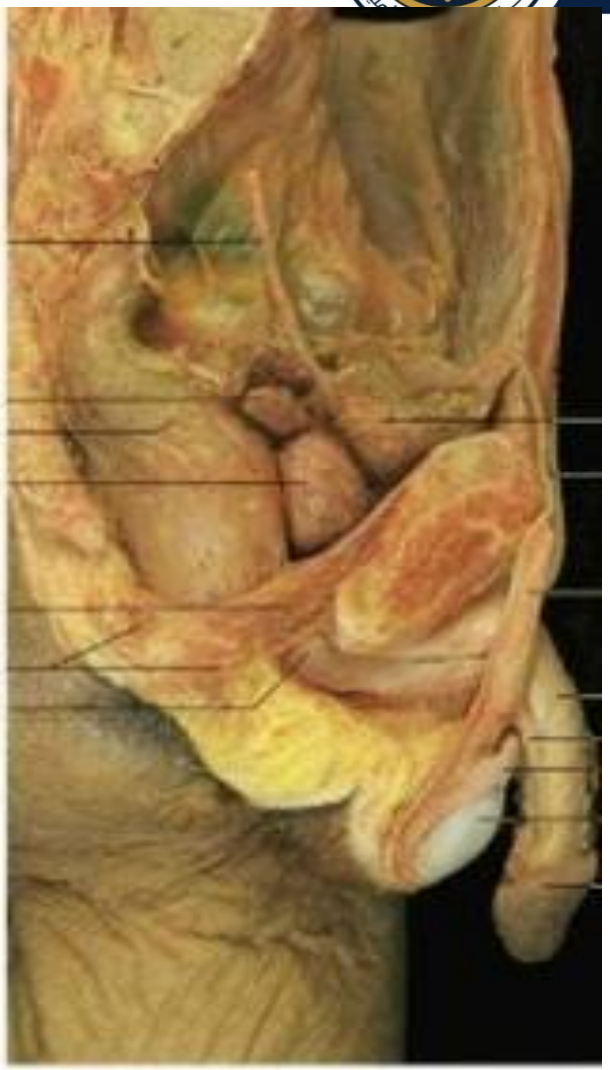
FIGURE 27.10 The Male Reproductive System. APR

Why does enlargement of the prostate interfere with urination?





Male genital organs, isolated (right lateral aspect).

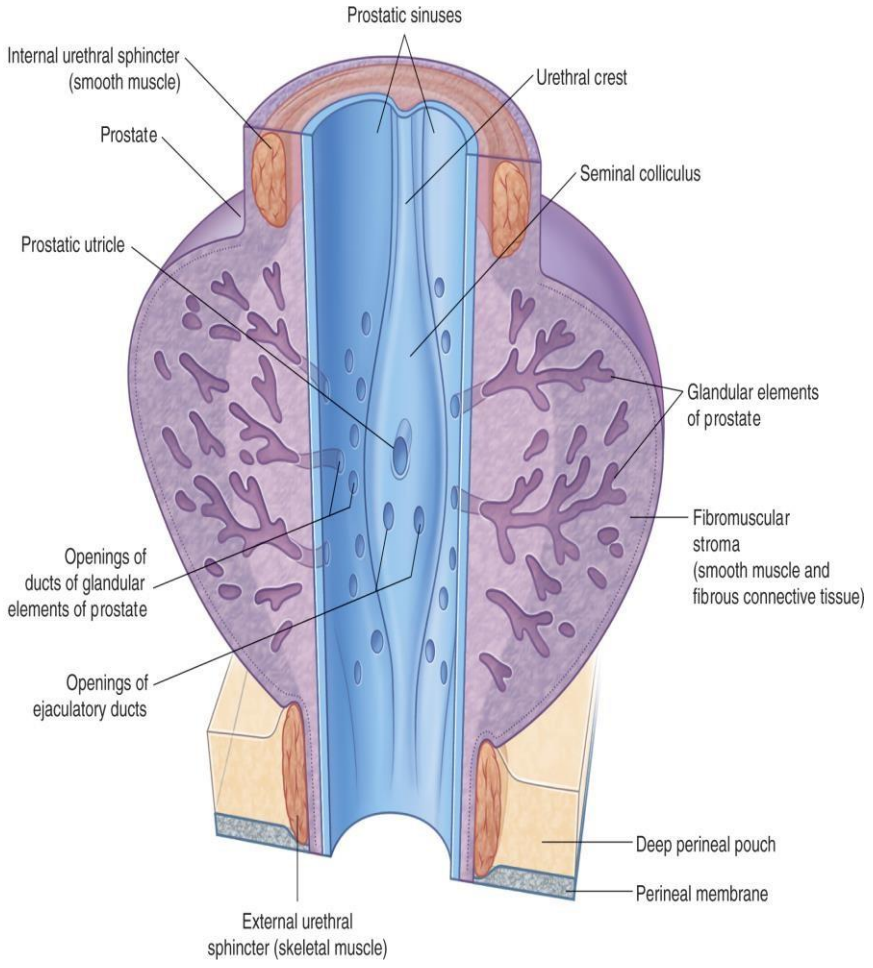


Male genital organs in situ (right lateral aspect).

C. THE EJACULATORY DUCT

MCQ

- Formed by union of the ampulla of the vas deferens with the duct of the seminal vesicle.
- It opens in the prostatic urethra.



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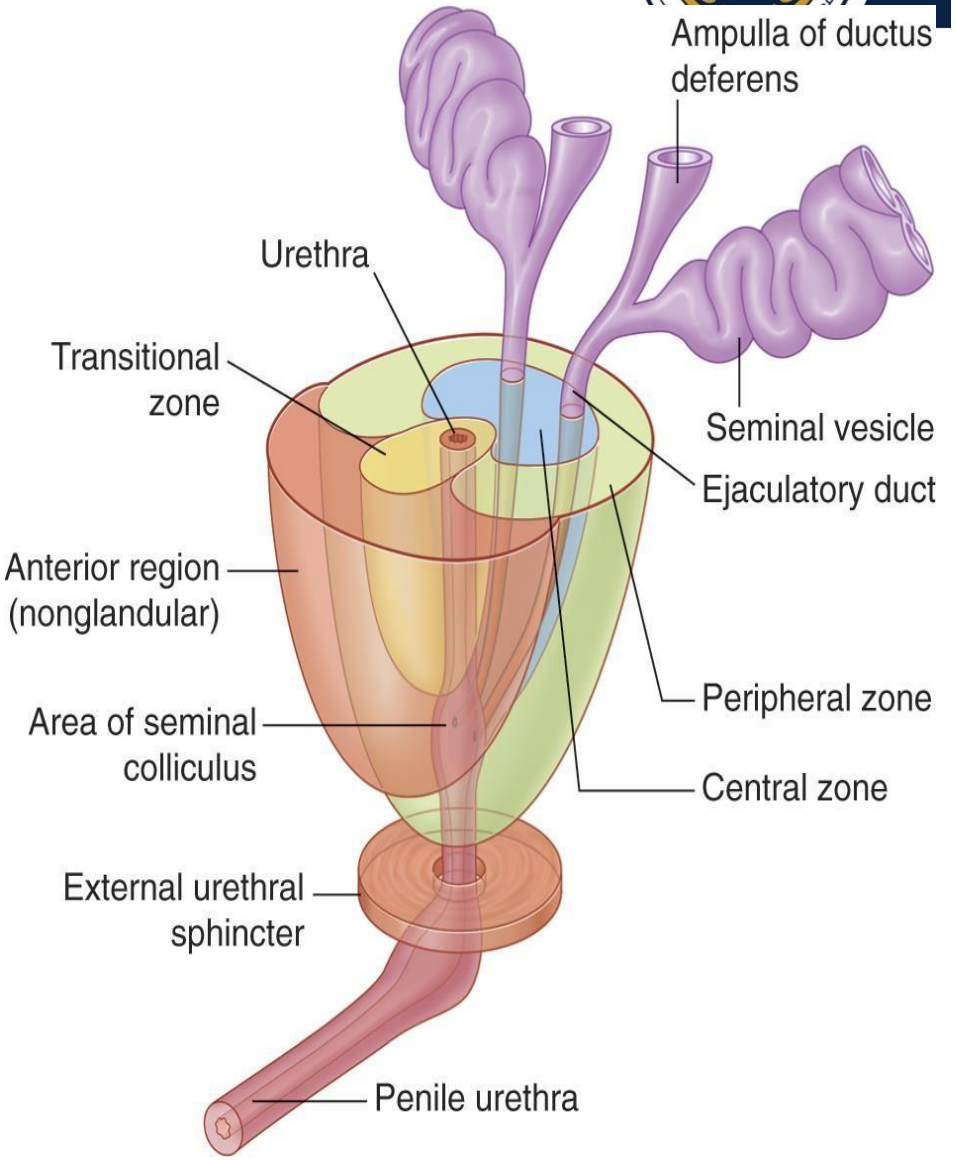


D. THE URETHRA

It is a common passageway for urine and semen

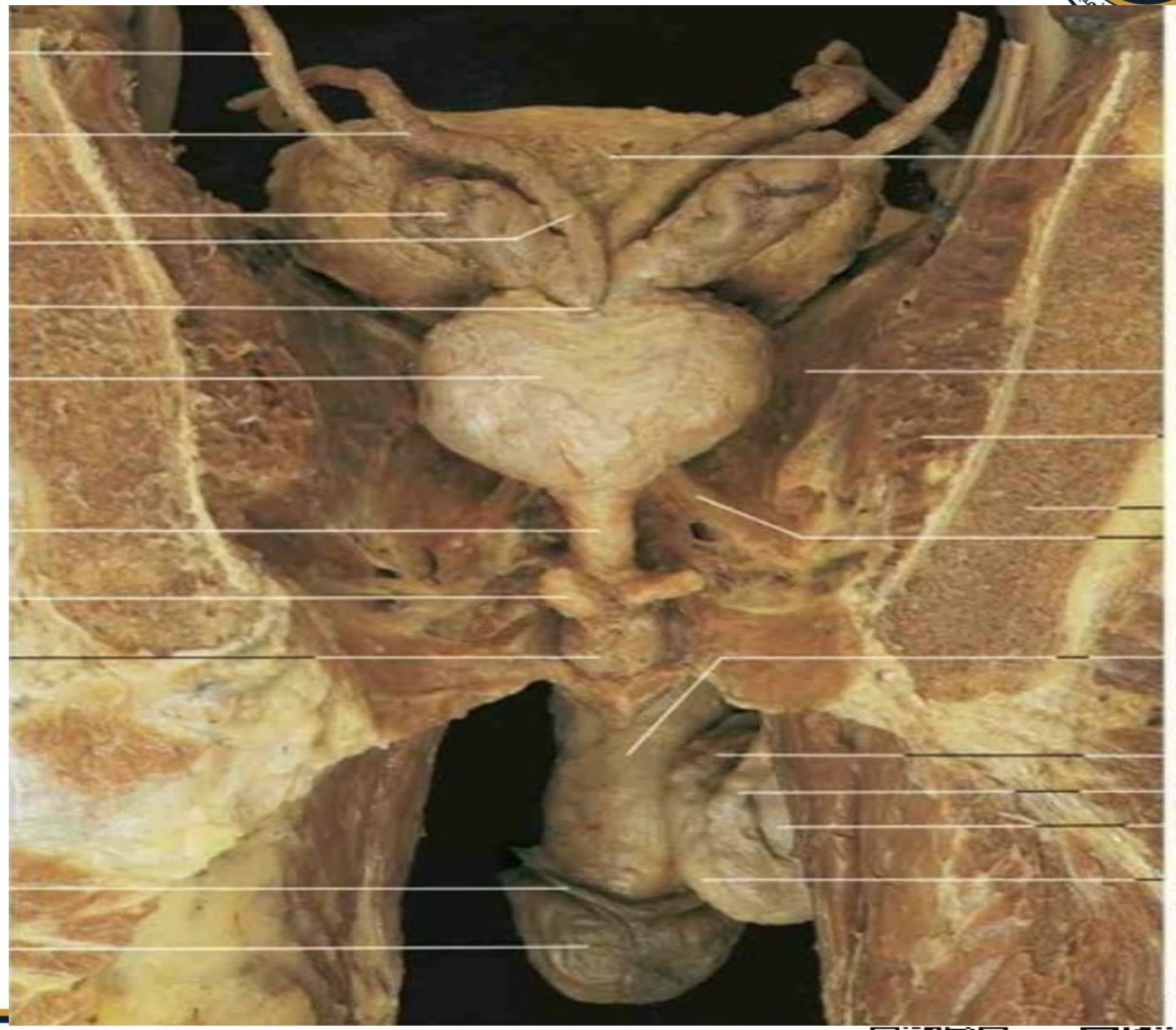
III. THE ACCESSORY GLANDS

They include:

A. Seminal vesicle

B. Prostate

C. Bulbourethral (Cowper's) glands

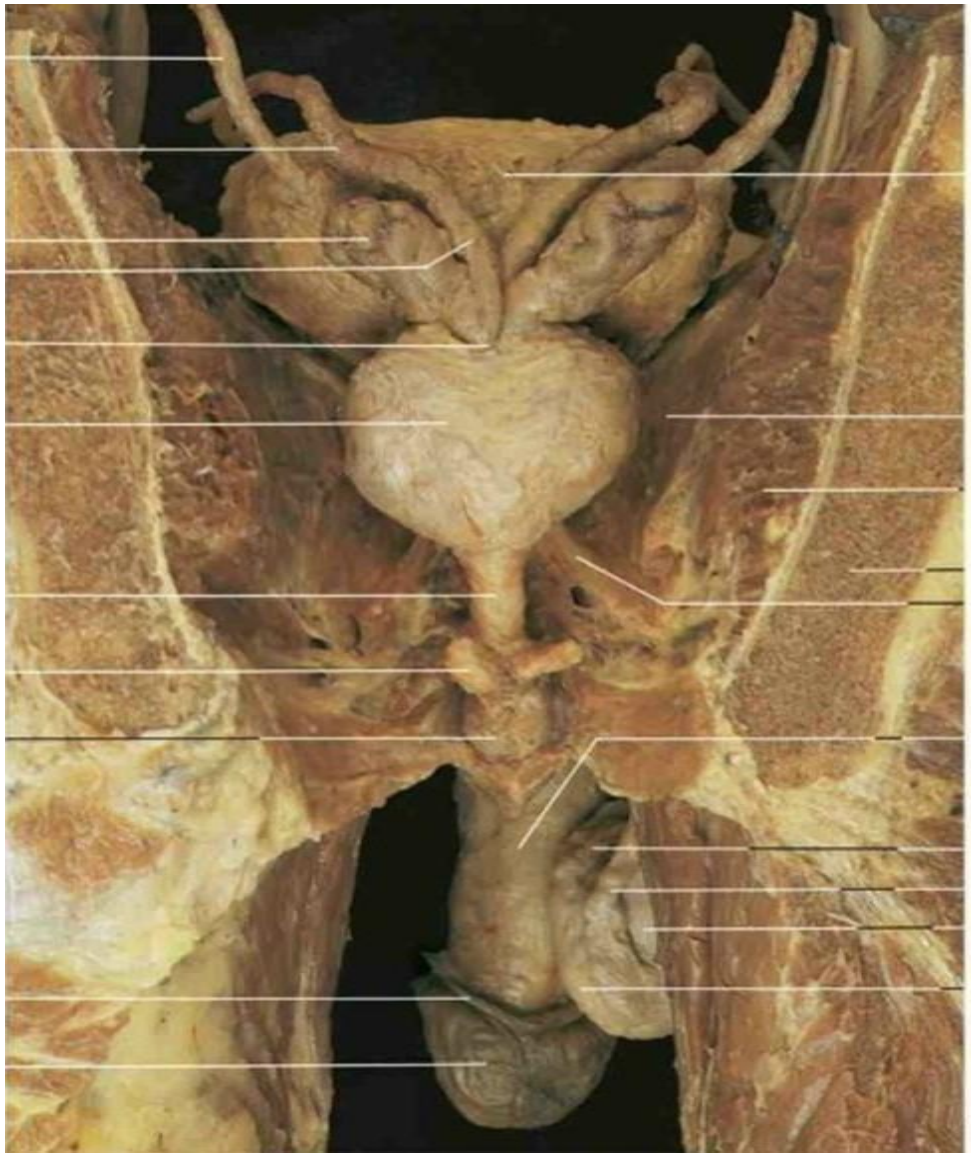


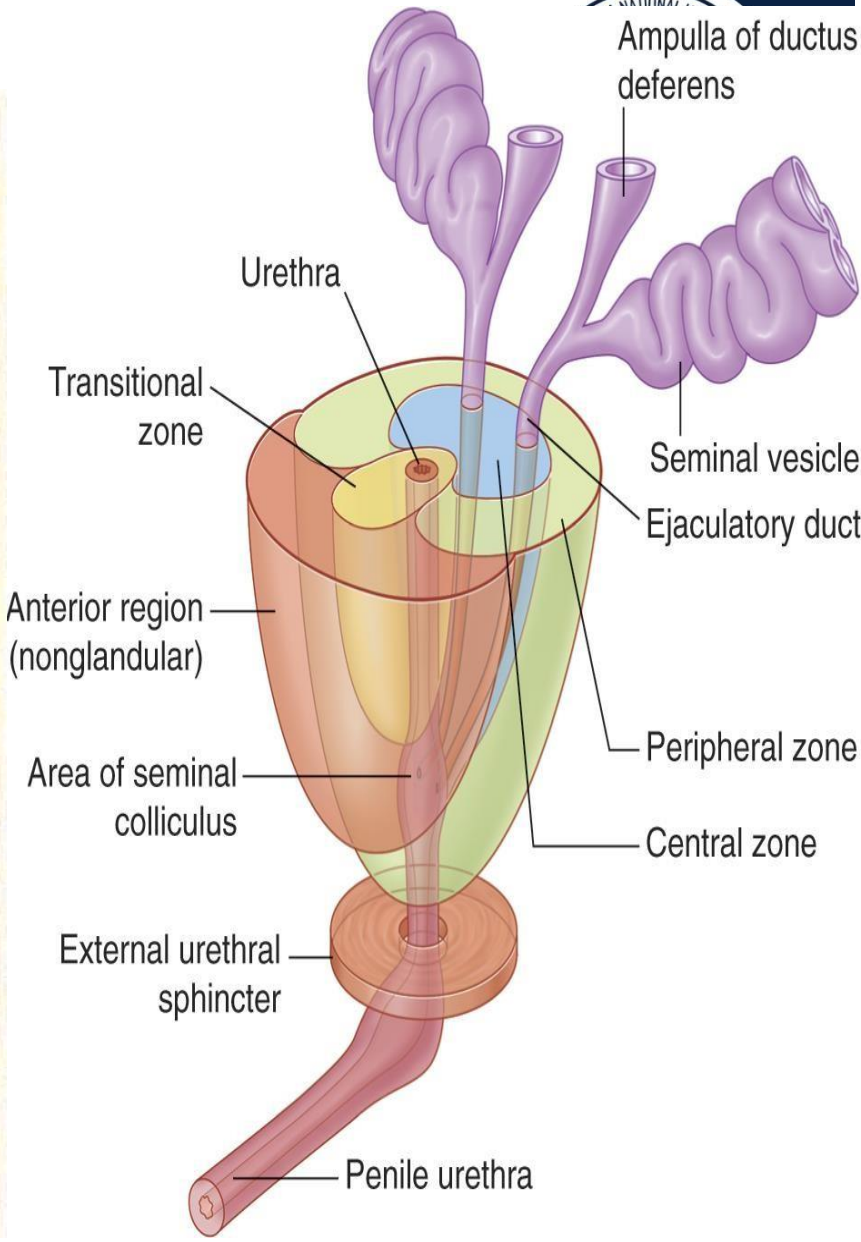
A. THE SEMINAL VESICLES

2 sacculated glands (5 cm long).

Lying behind the urinary bladder, lateral to the ampulla of vas & anterior to the rectum.

Its duct joins the vas deferens to form ejaculatory duct.





B. THE PROSTATE GLAND

- The urethra & 2 ejaculatory ducts traverse the prostate: dividing it into **5 lobes:**

- **MEDIAN LOBE:**
  - It lies between the urethra and the 2 ejaculatory ducts.
  - It projects inside the urinary bladder forming "uvula vesicae" just behind the **Internal Urethral Meatus.**
  - It contains much glandular tissue (common site of enlargement and adenomas).
- **Anterior Lobe.**
- Posterior Lobe.
- Right Lobe.
- **Left Lobe.**

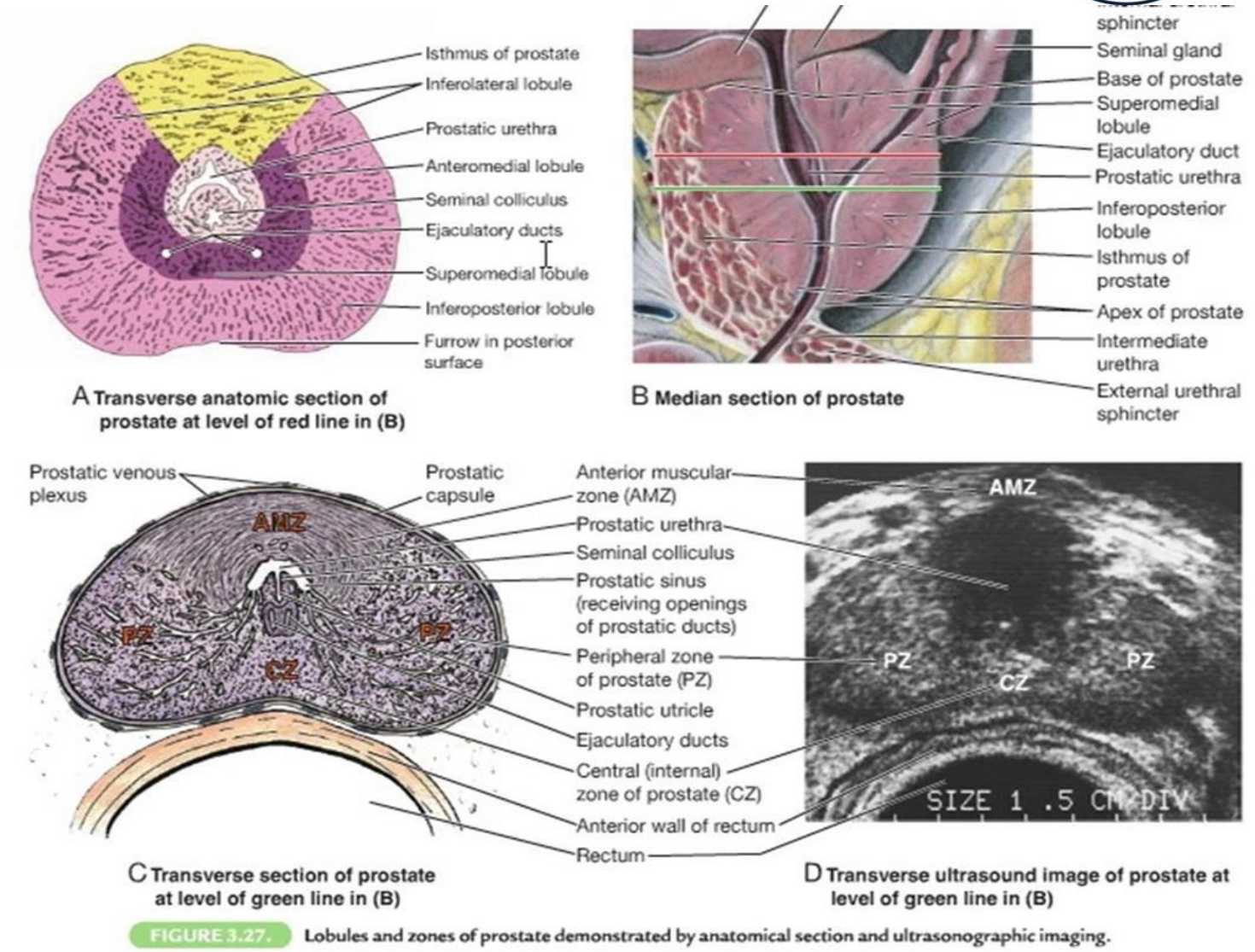
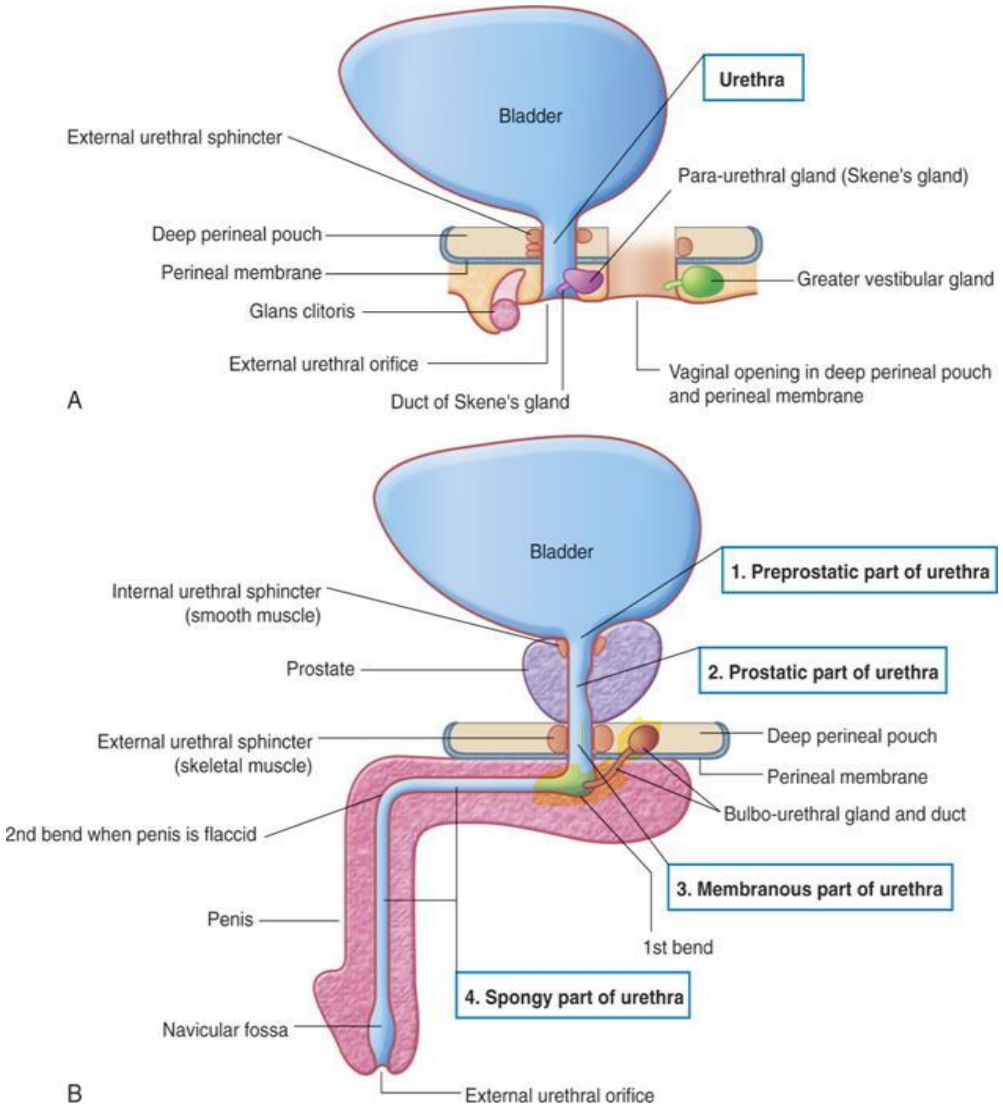


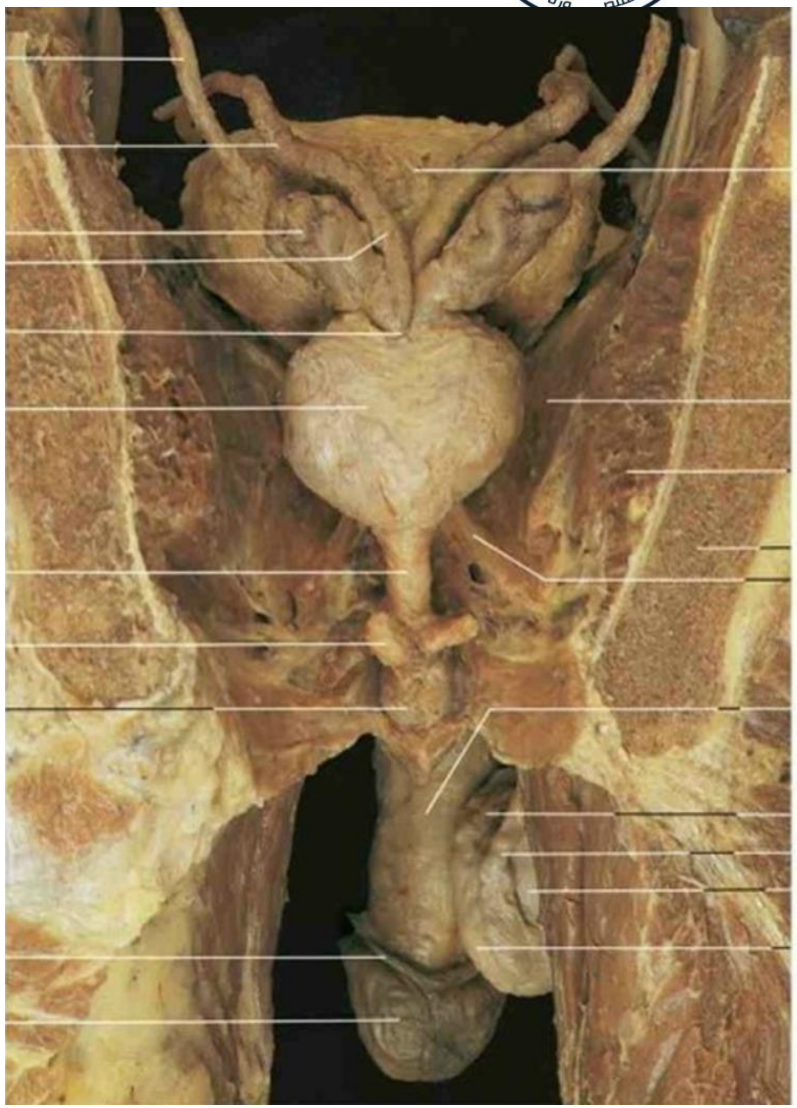
FIGURE 3.27. Lobules and zones of prostate demonstrated by anatomical section and ultrasonographic imaging.

C. THE BULBOURETHRAL (Cowper's) glands:

They are small gland that lie on either side of membranous urethra.

They open into penile urethra.





Female reproductive organs

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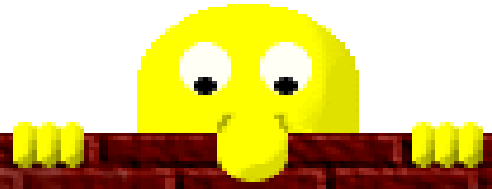

Female External Genitalia

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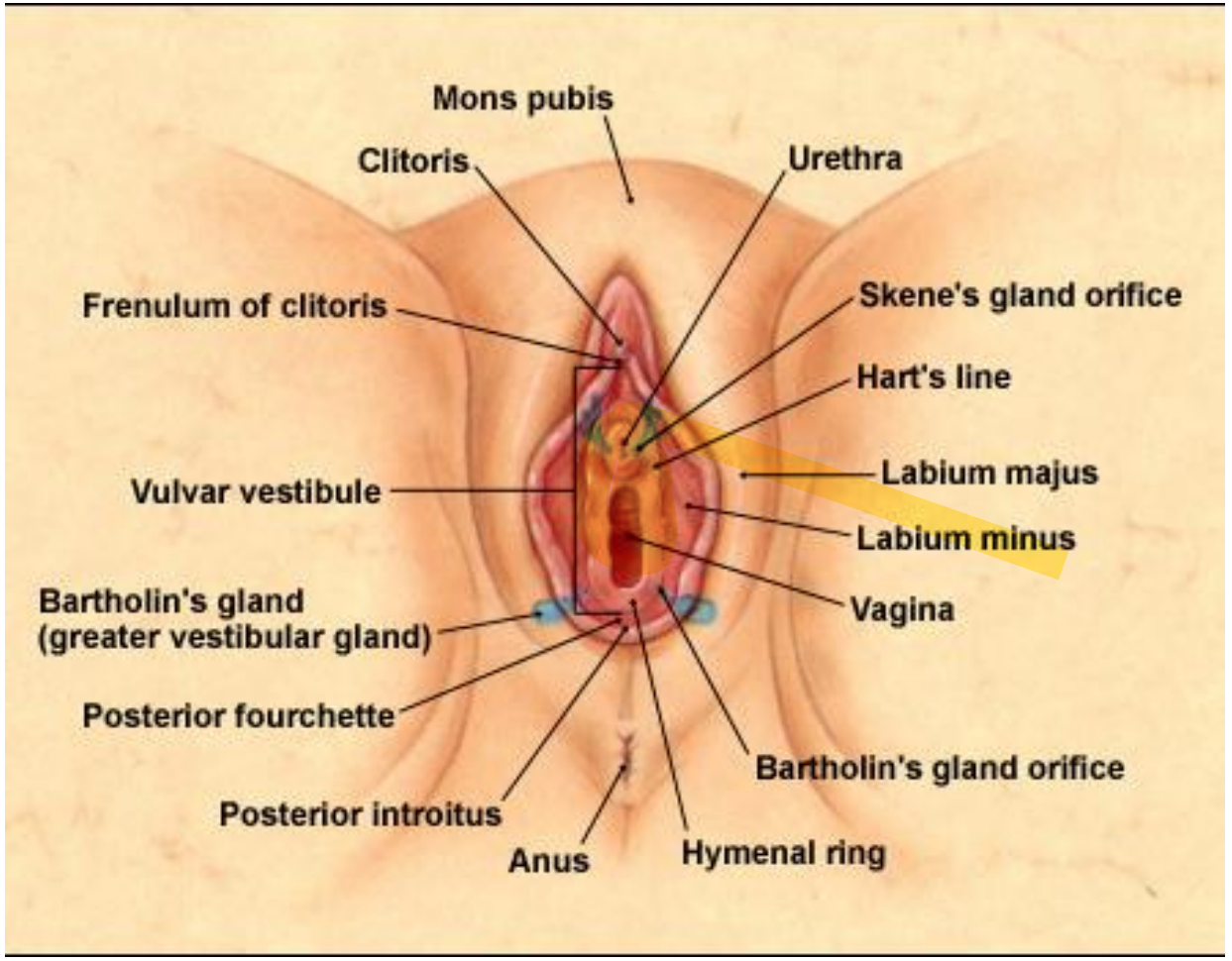
THE VULVA

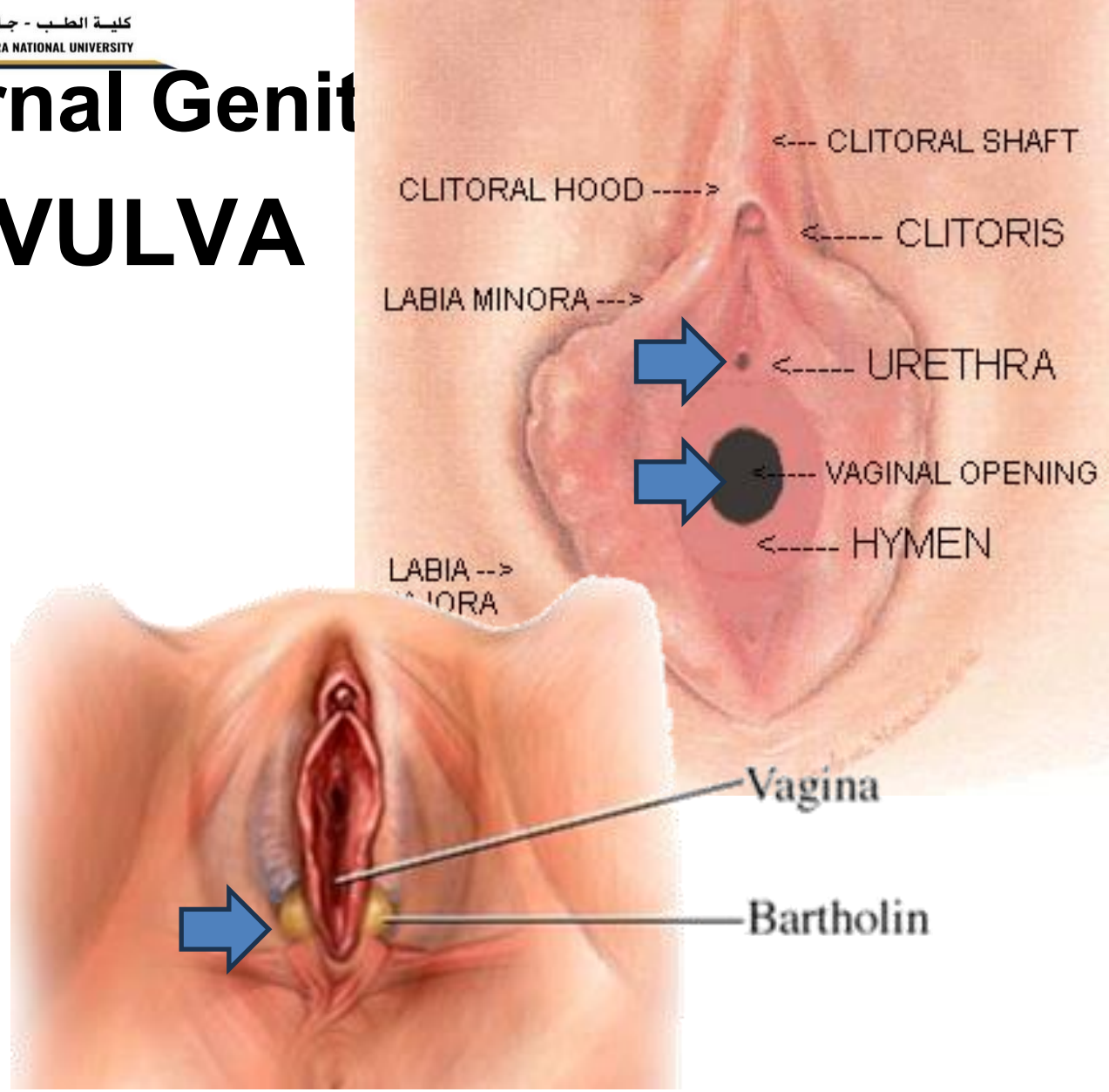

Mons pubis
Clitoris
Urethra
Frenulum of clitoris
Skene's gland orifice
Hart's line
Labium majus
Vulvar vestibule
Labium minus
Vagina
Bartholin's gland
(greater vestibular gland)
Posterior fourchette
Bartholin's gland orifice
Posterior introitus
Anus
Hymenal ring

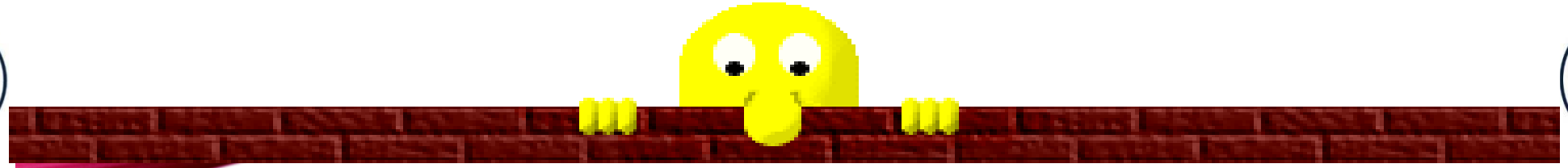
Female External Genit

THE VULVA

Vestibule:

- The area between the inner aspects of the labia minora.
- **Structures that open in the vestibule** are:
  - A. Urethra
  - B. The Bartholin glands & paraurethral ducts.
  - C. The vagina.





Female internal Genitalia

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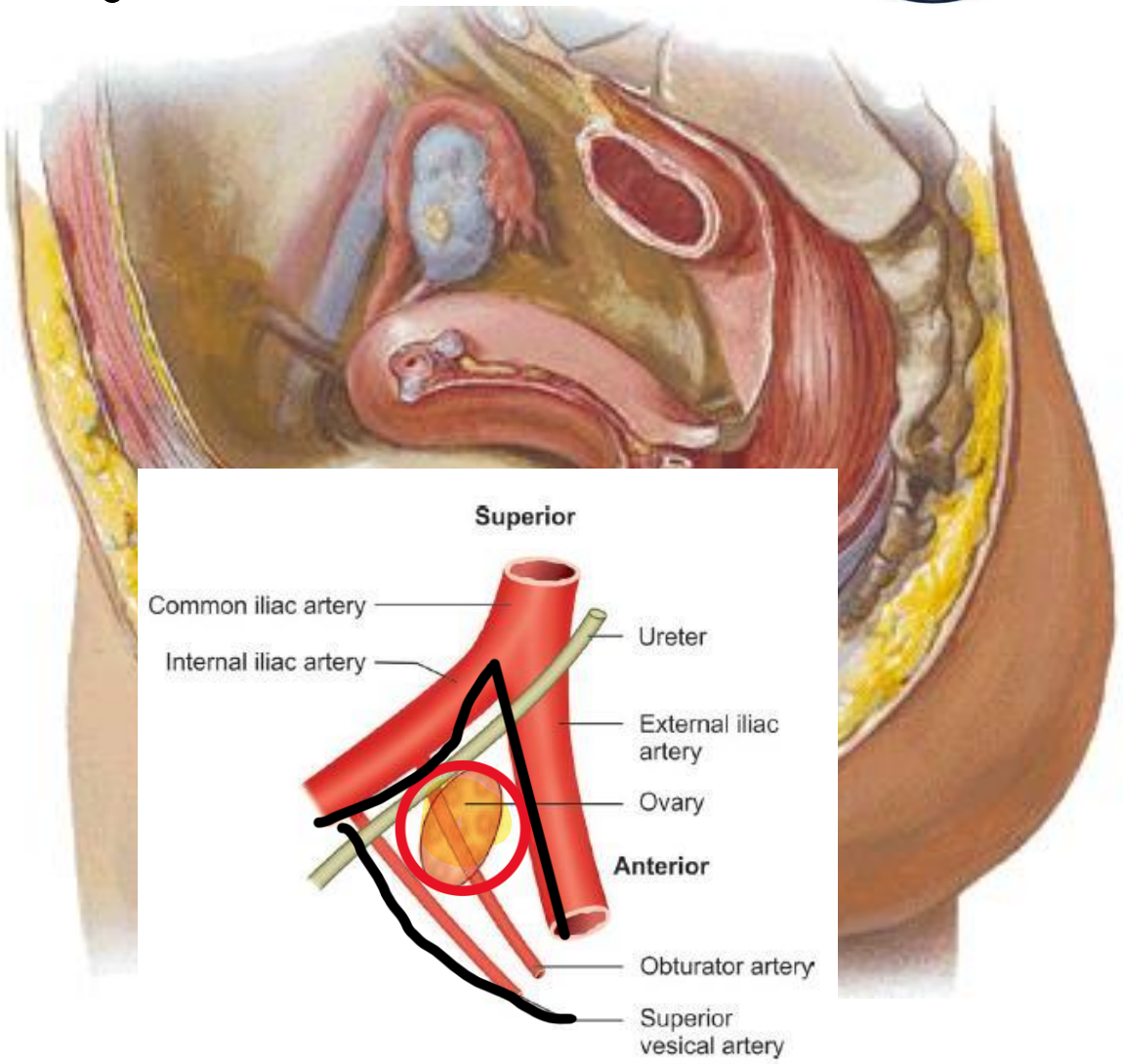
The Ovary

Site: The position of the ovary is variable but commonly lie against the lateral wall of the true pelvis in a depression called the **ovarian fossa.**

SAQ

The ovarian fossa is bounded by:

- External iliac vessels **above**.
- Obturator nerve & vessels **below**.
- Internal iliac vessels & ureter **behind**



The Ovary

The ovary is completely covered by peritoneum and attached to the broad ligament by mesovarium.

A. Peritoneal ligaments:

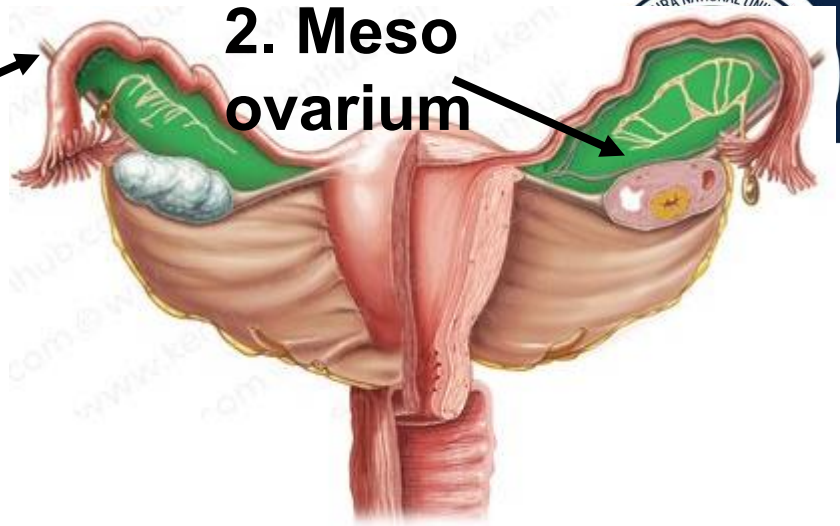
1. Suspensory ligament; between the tubal end of the ovary to side wall of the pelvis.

2. Mesovarium: between the anterior border of the ovary to the upper layer of the broad ligament.

B. Non-peritoneal ligaments:

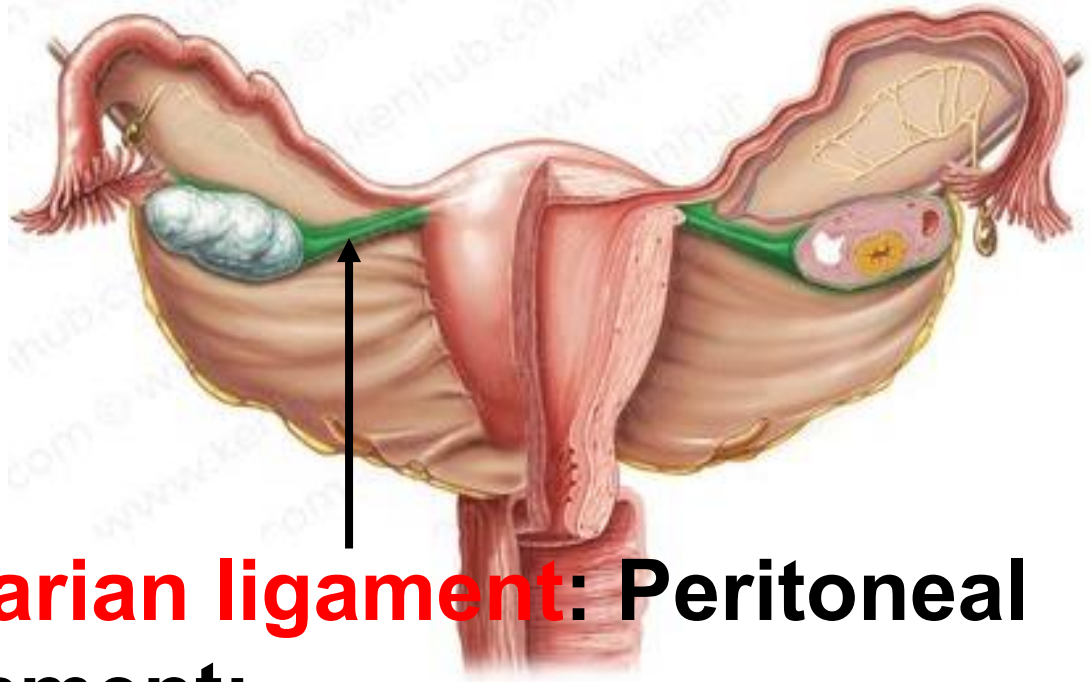
3. **Ovarian ligament:** from the uterine end of the ovary to the lateral angle of the uterus

1. Suspensory ligament



Peritoneal ligament:

1. Suspensory ligament
2. Meso ovarium.



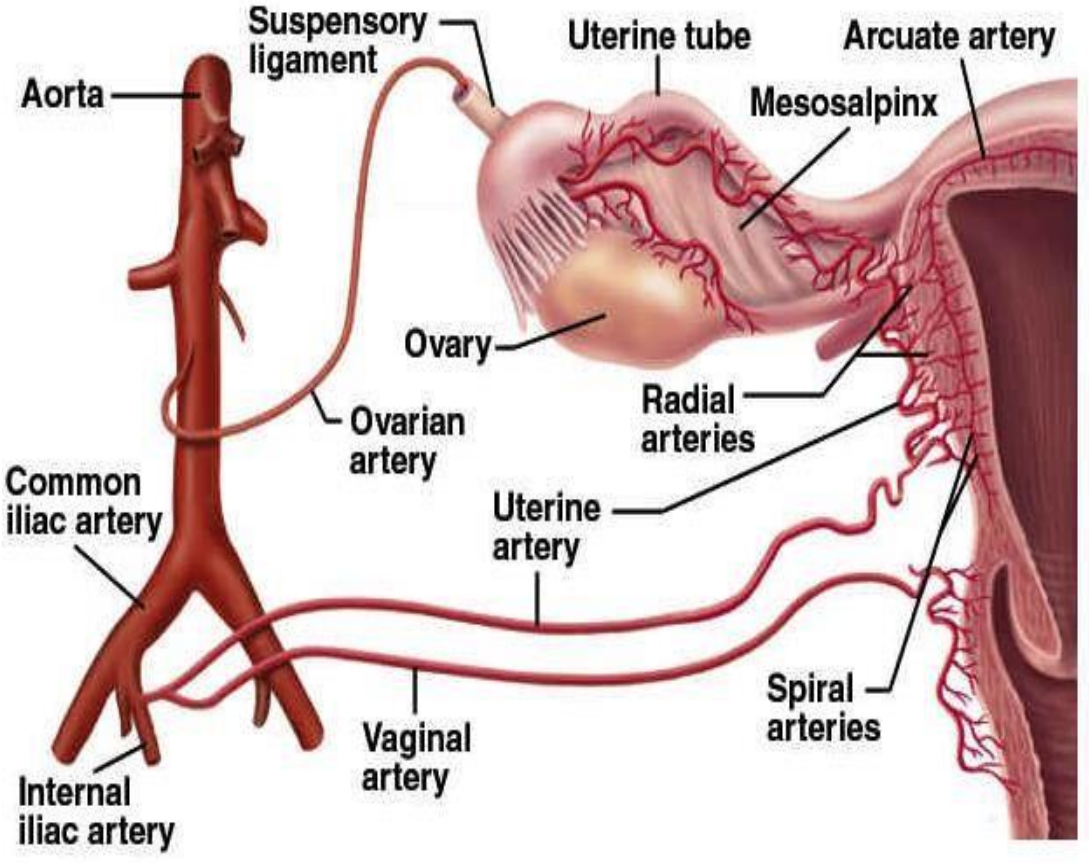
- **Ovarian ligament**: Peritoneal ligament:

The Ovary

Blood supply

Arterial supply:

1. **Ovarian artery:** from the abdominal aorta, reaches the ovary through both the suspensory ligament and mesovarium.
2. **Uterine artery:** is a branch from the anterior division of the internal iliac artery. It anastomoses with the ovarian artery.



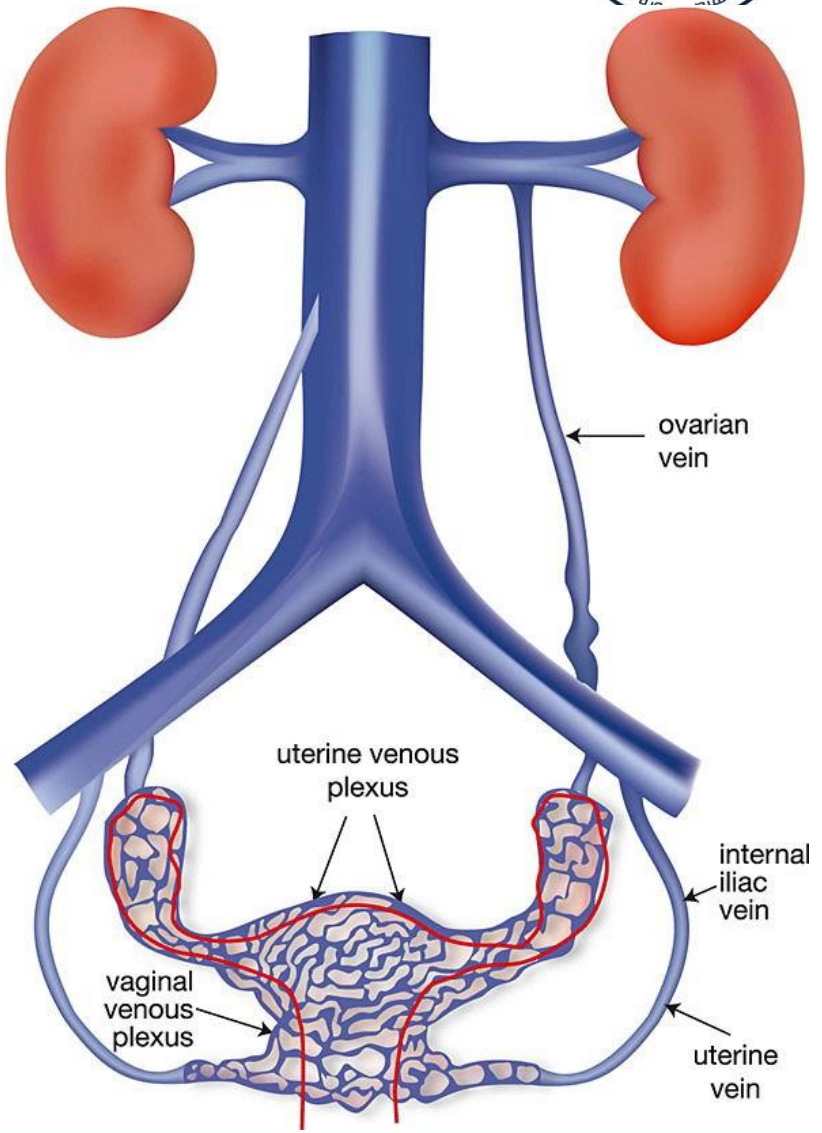
The Ovary

Blood supply

Venous drainage:

The right one in I.V.C.

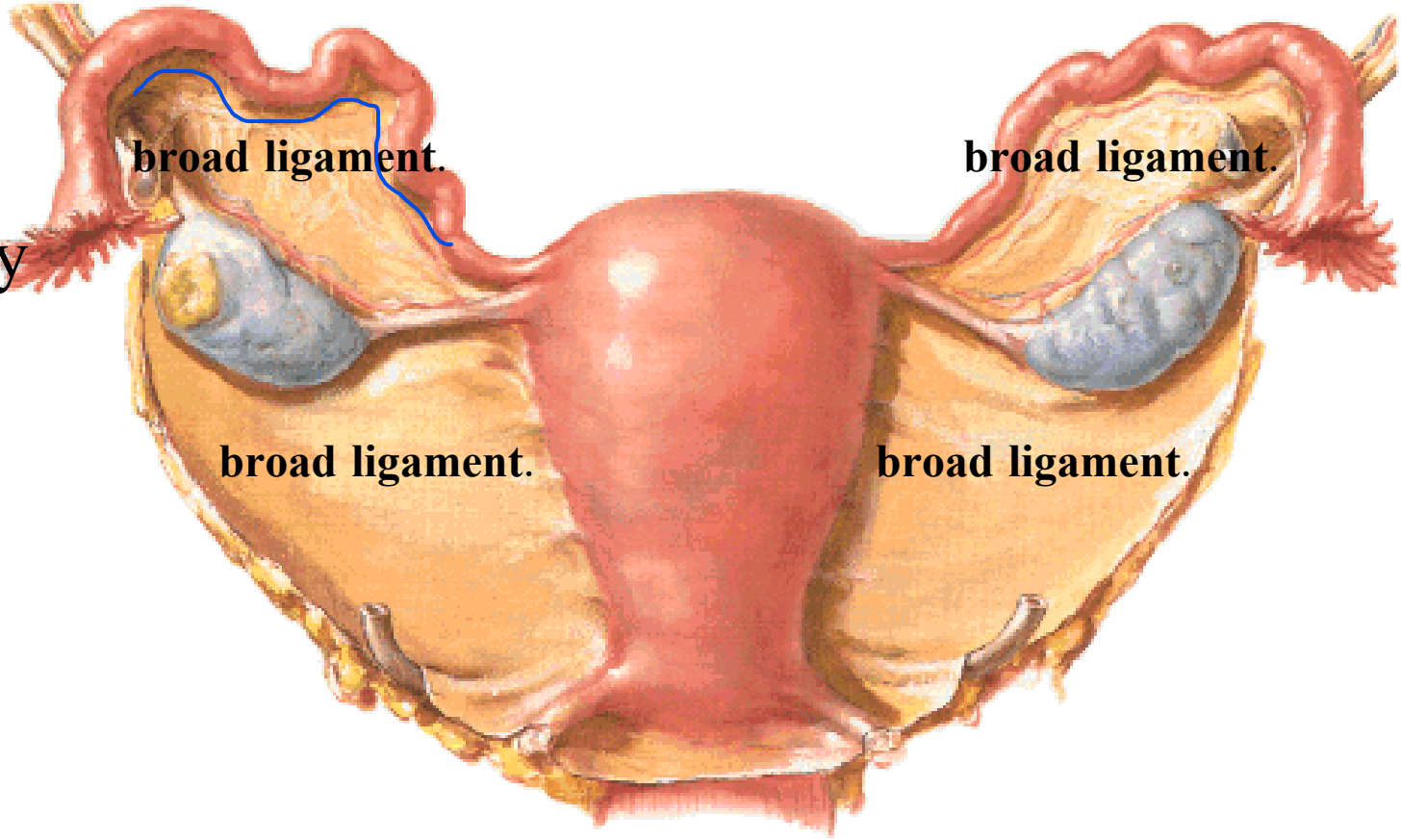
The left one in left renal vein.



The Uterine tube

Site:

- It extends from the superior angle of the uterus to the ovary on the side wall of the pelvis
- in the **medial 4/5** of the upper free border of the **broad ligament.**



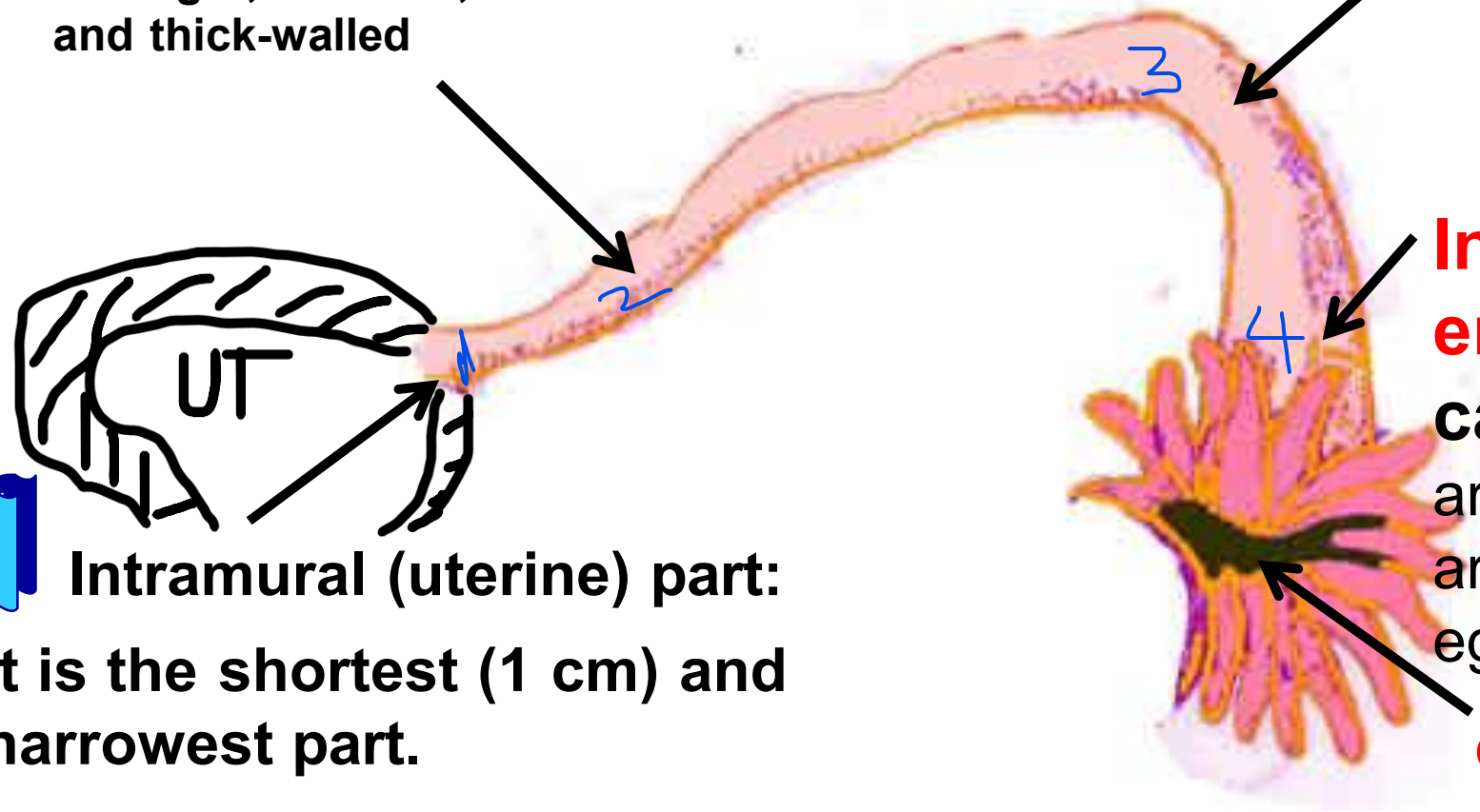
Length: 10 cm.

PARTS of fallopian tube

2 **The isthmus** It is 2 cm in length, rounded, narrow and thick-walled

3 **Ampulla:** Tube widens to form the (5 cm)

FERTILIZATION



4 **Infundibulum (Fimbriated end) (2 cm) End of tube is called the**

are the finger-like projections around the opening that trap the egg as it leaves the ovary

ostium

1 **Intramural (uterine) part:**

- **It is the shortest (1 cm) and narrowest part.**

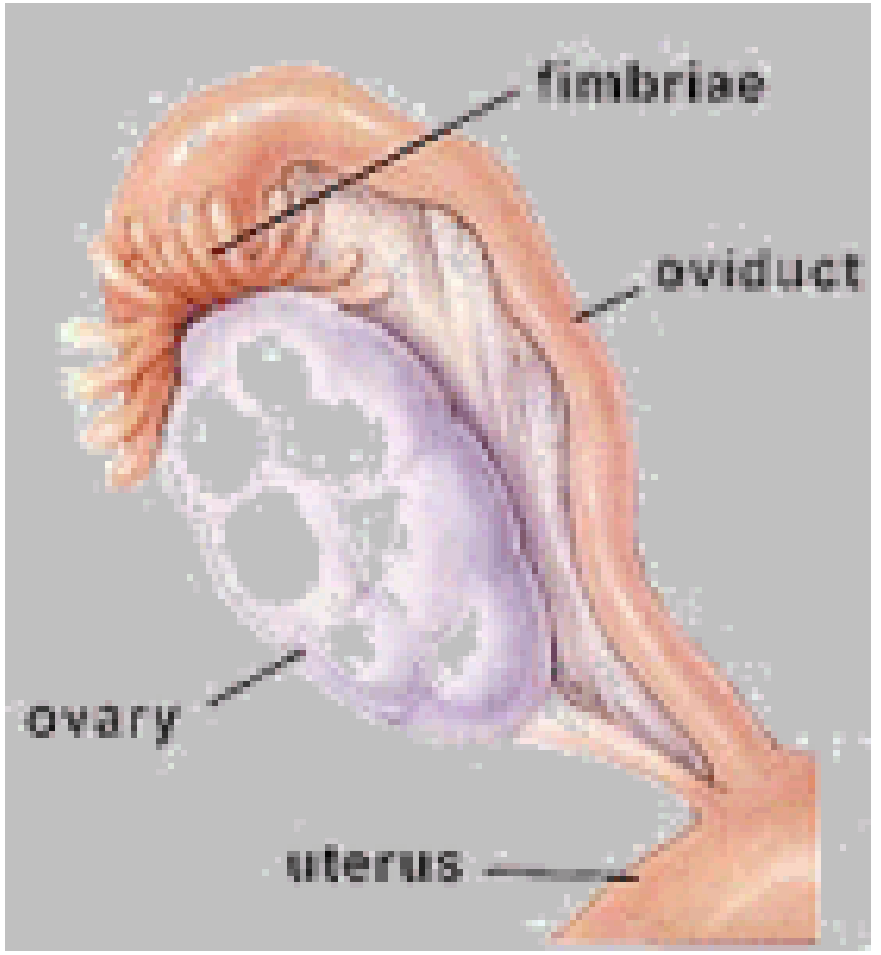
The Uterine tube

Tubal functions

1. **Ovum Pick Up:** at the time of ovulation, by their free fimbrial end.

2. **Transport Of The Ova:** through the tubal lumen, by their peristaltic and ciliary movements.

3. **Production Of Secretions:** necessary for capacitation of the sperm and nutrition of the ova during their journey by their lining cells.

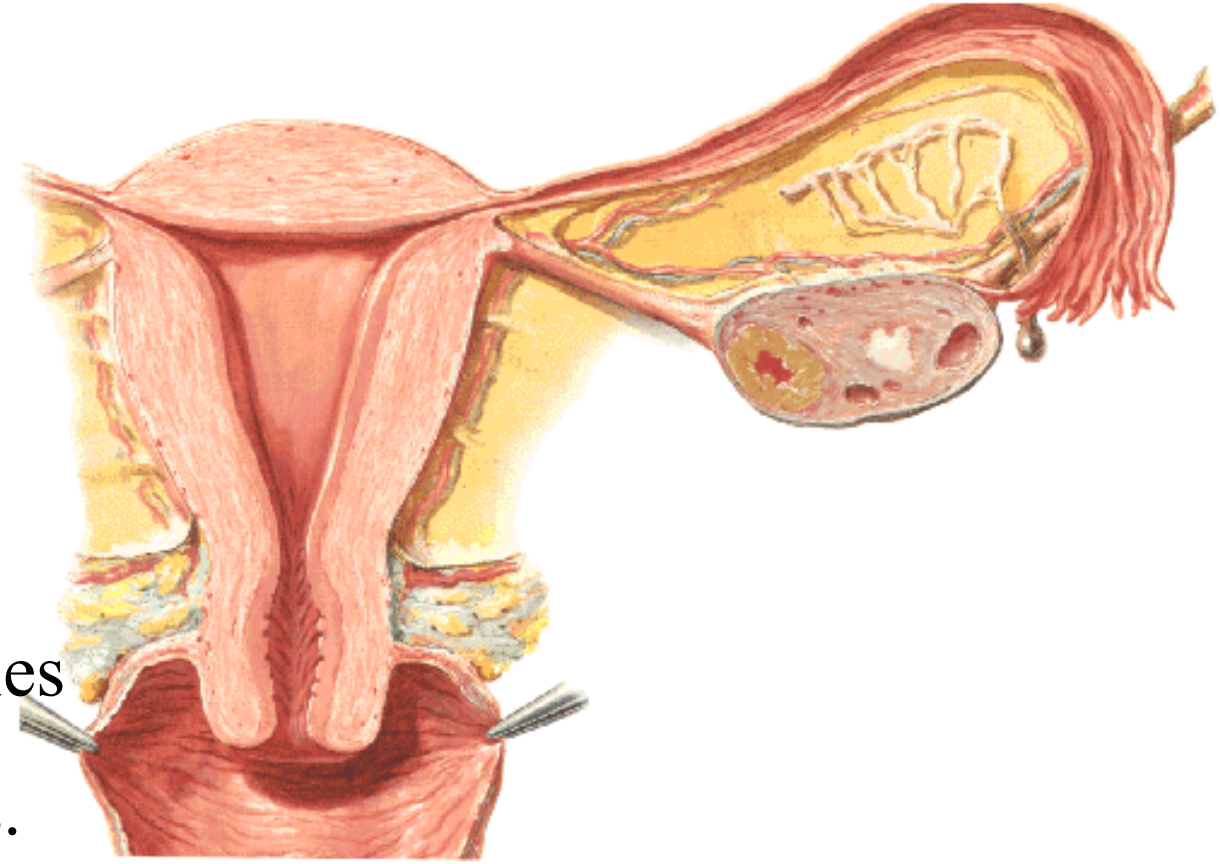


The Uterine tube

Blood Supply

Arterial supply:

- **Medial 2/3:** by the **uterine artery**.
- **lateral 1/3 :** by the **ovarian artery**.



Venous drainage:

- By veins accompanying the arteries into the uterine and ovarian veins.

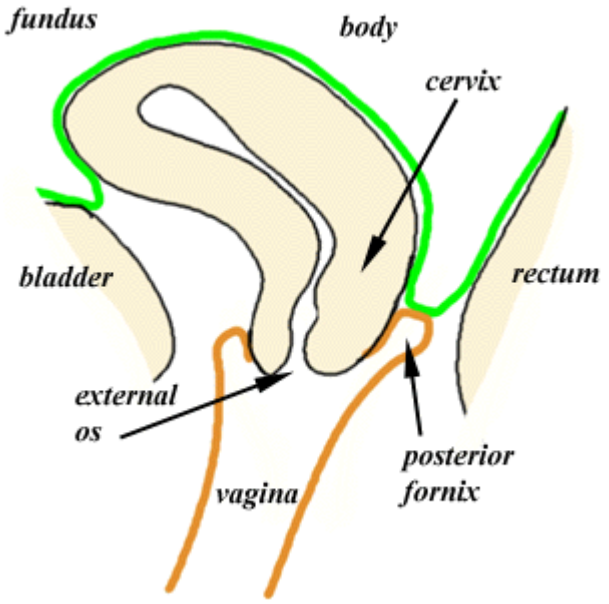
The Uterus

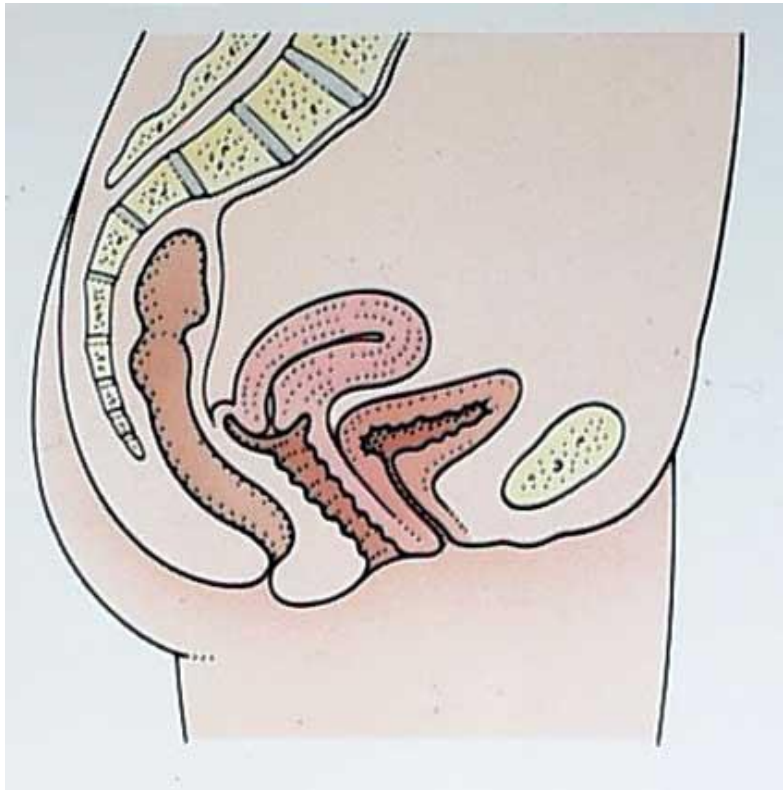
The uterus is a hollow, muscular, pear-shaped organ about the

Size: of a woman's clenched fist.

Parts: divided into the

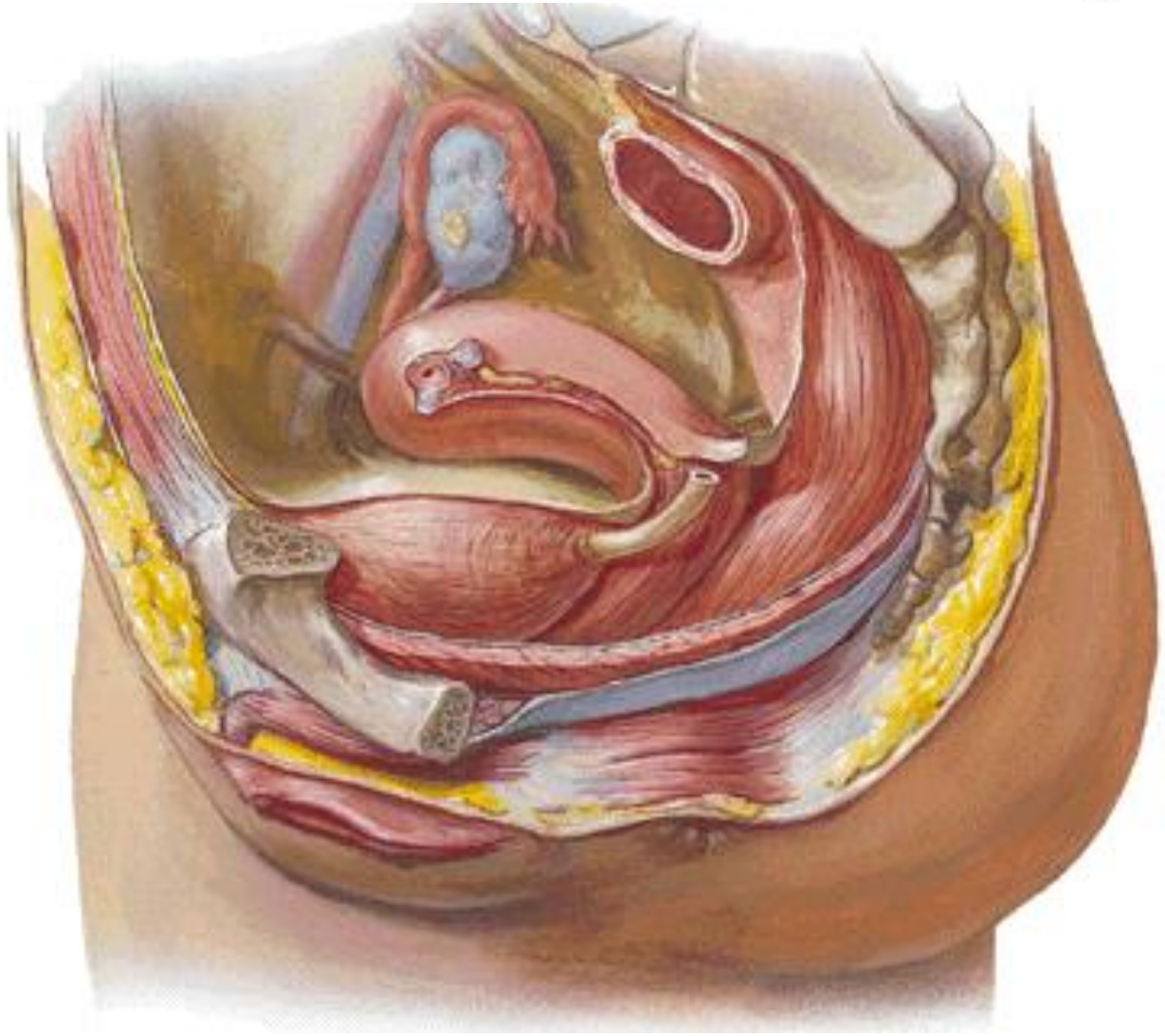
1. fundus.
2. body or corpus
3. cervix.





SITE

in the true pelvis in between urinary bladder and rectum



Subdivision

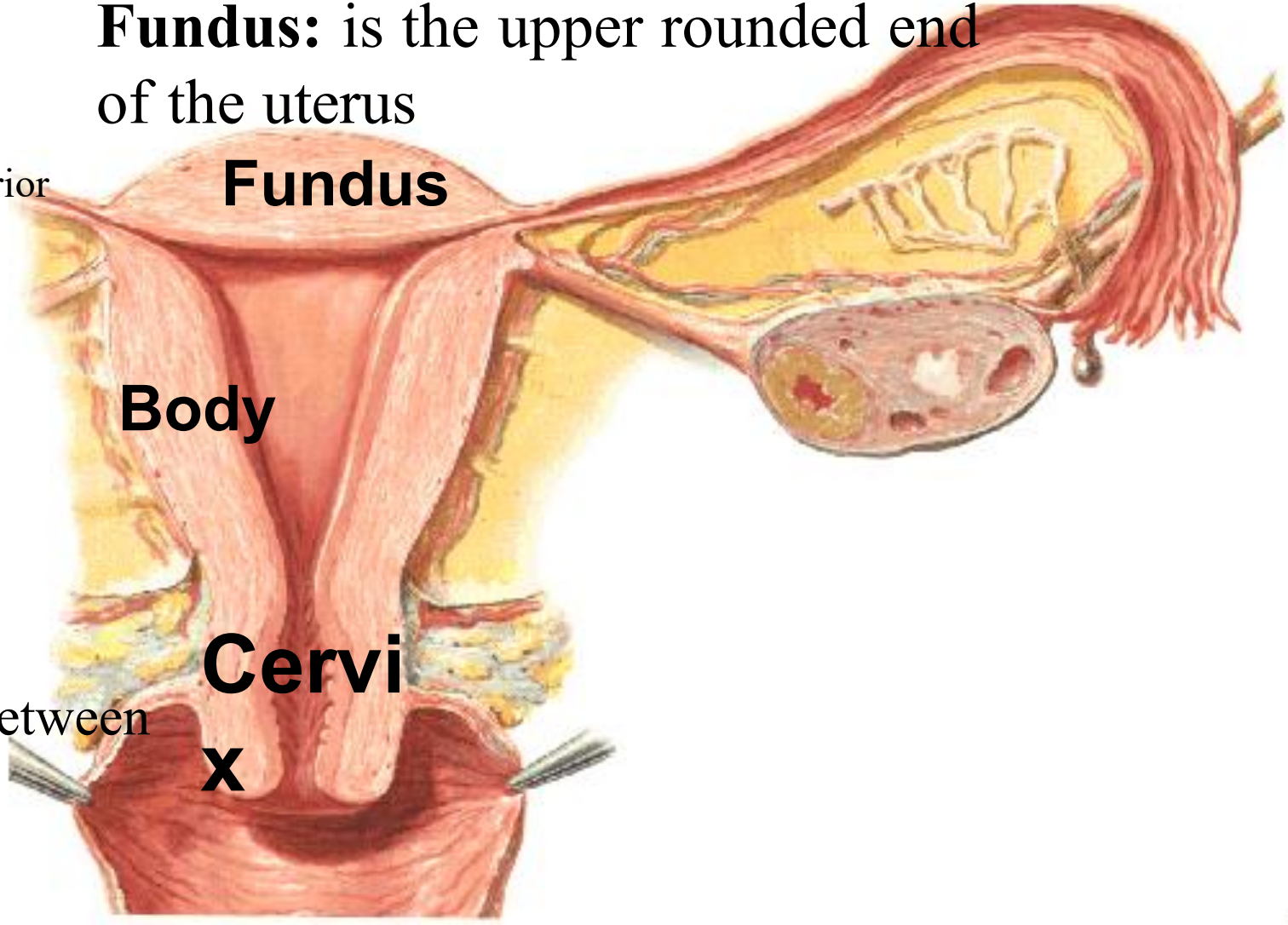
Body:

- It is triangular in outline
- It has two surfaces: anterior (vesical) and posterior (intestinal).

Cervix:

- It is cylindrical tube 1x1 inch. It is subdivided into two parts: **vaginal** and **supravaginal** portions.
- The cervical canal is fusiform lies between the internal and external os.

Fundus: is the upper rounded end of the uterus

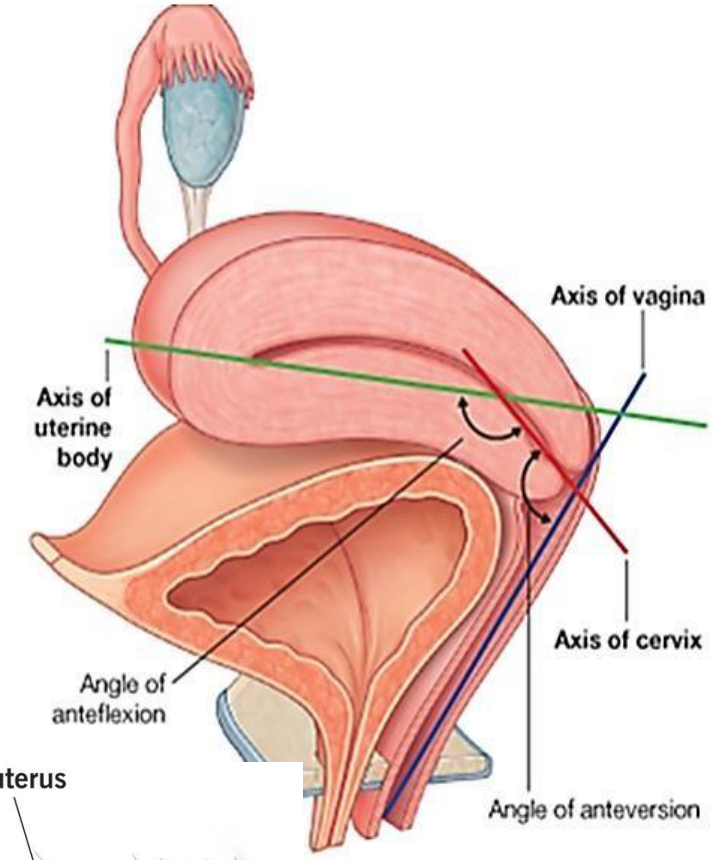


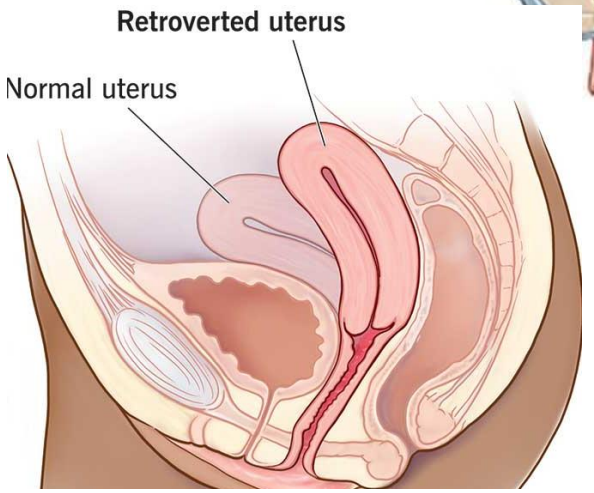
The Uterus

Position

- The uterus is kept in an anteverted anteflexed position (AVF). MCQ
- AnteVersion right angle : The uterus is inclined anteriorly to axis of the Vagina.
- AnteflexIon obtuse angle : The body of the uterus is bent forwards upon the cervix.

Abnormal uterine position may be **retroverted and/or retroflexed.**

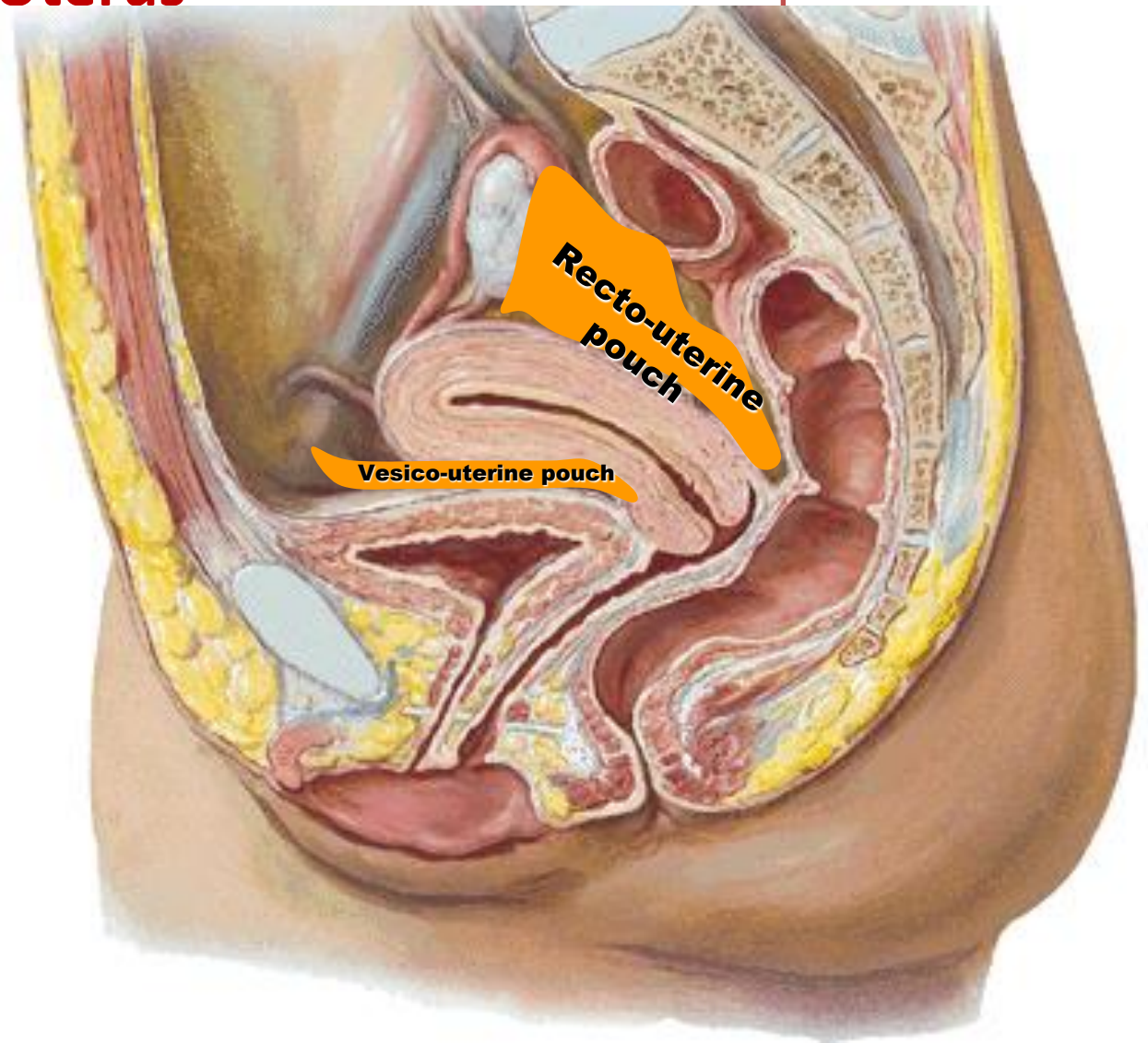


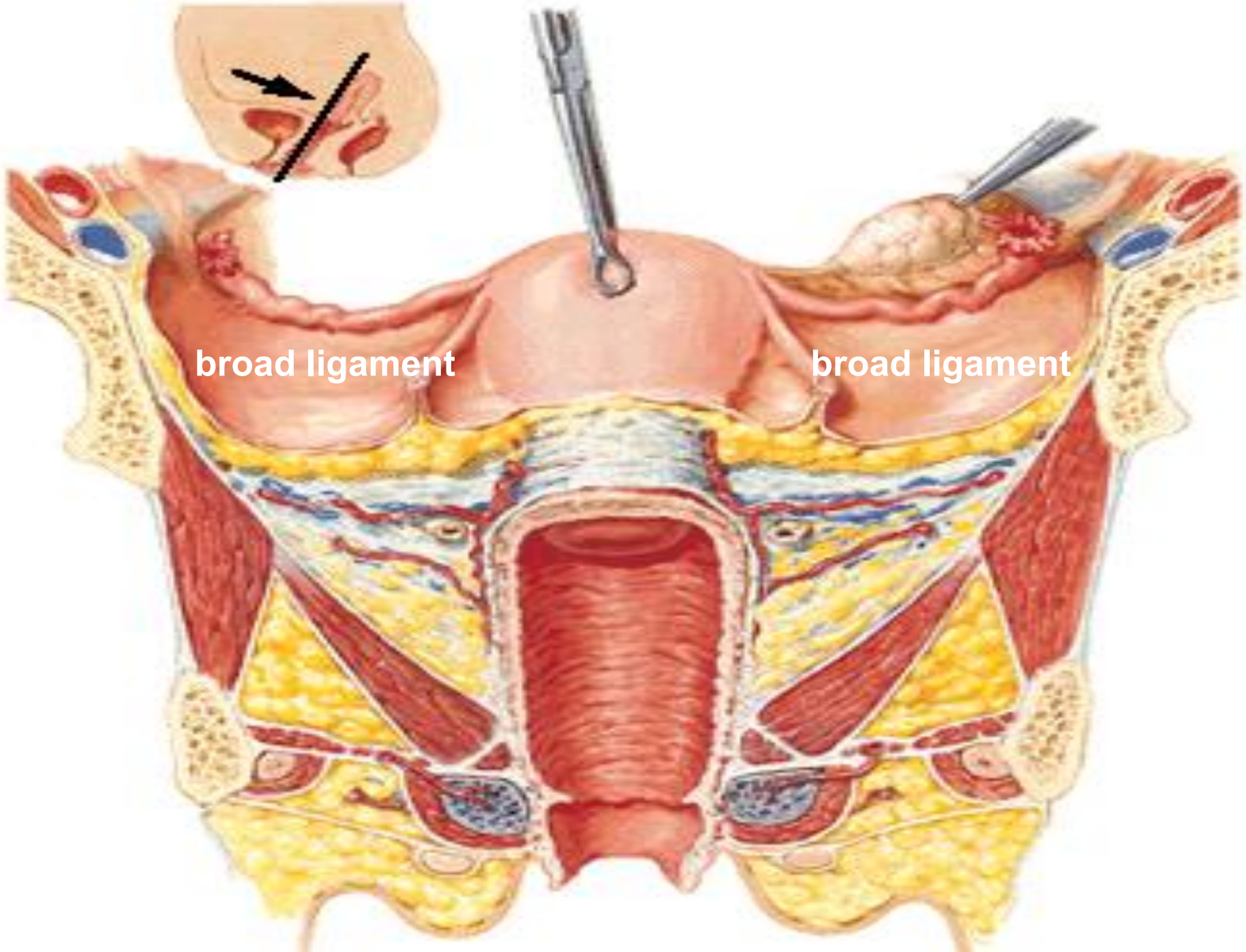


The Uterus

Relations of the Body of the Uterus

- **Anteriorly:**
  - The bladder and vesicouterine pouch.
- **Posteriorly:**
  - The pouch of Douglas.
- **Laterally:**
  - The broad ligament on each side.




broad ligament
broad ligament

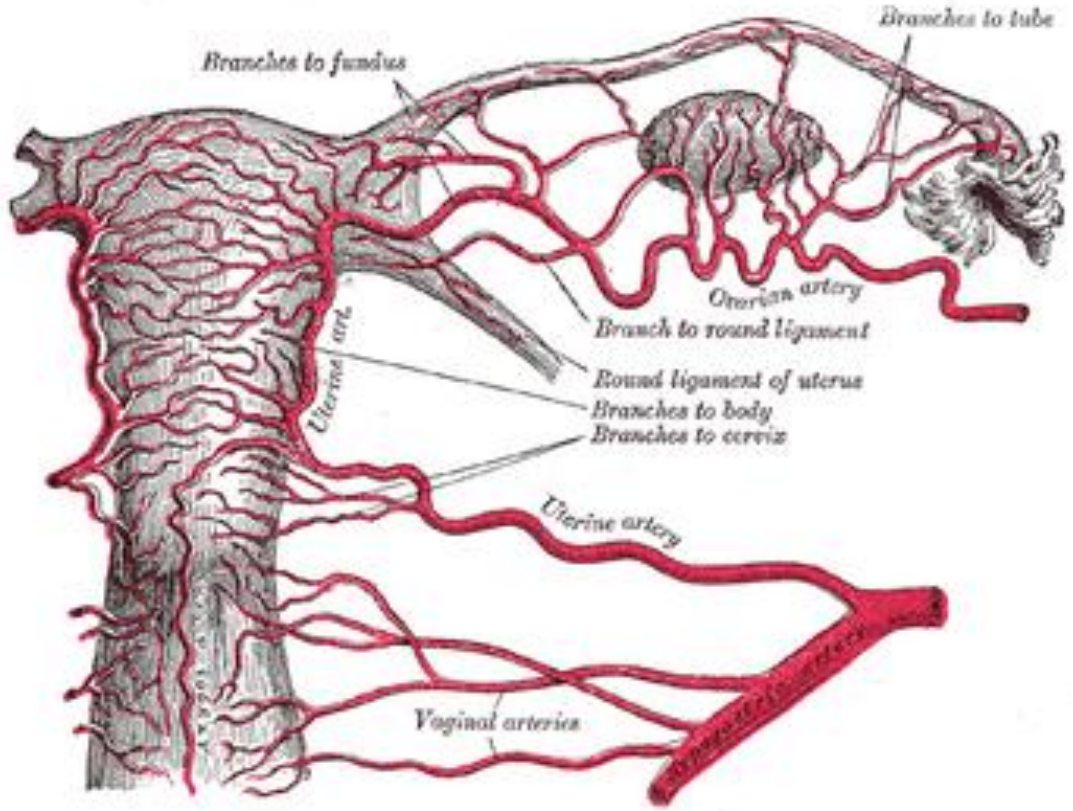
The Uterus

Blood Supply

Arterial supply:

THE UTERINE ARTERIES

THE OVARIAN ARTERIES

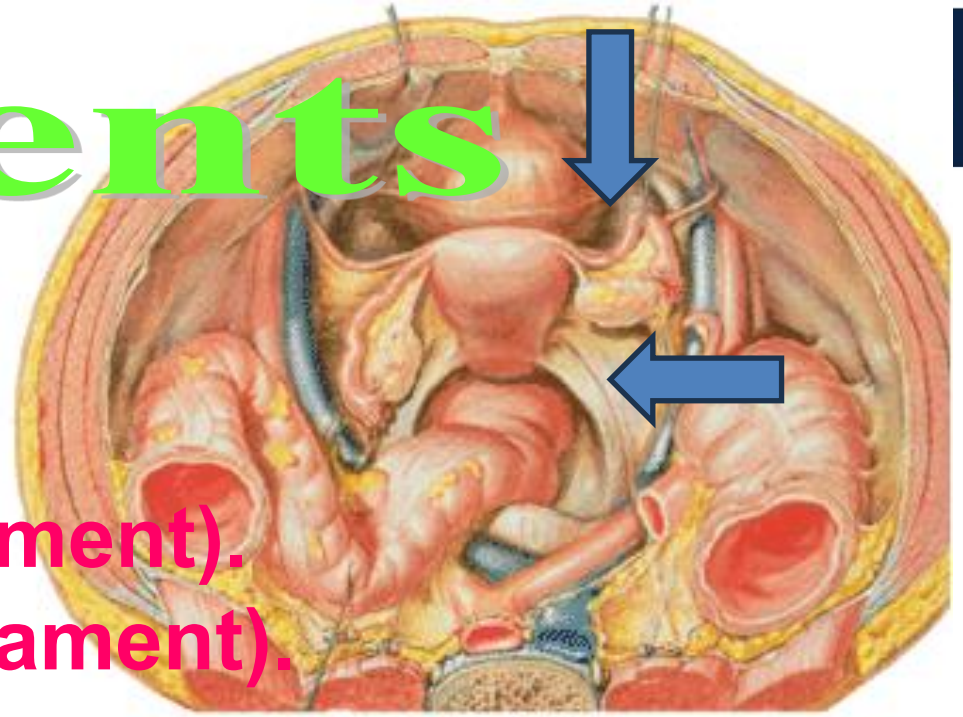


Ligaments

SAQ

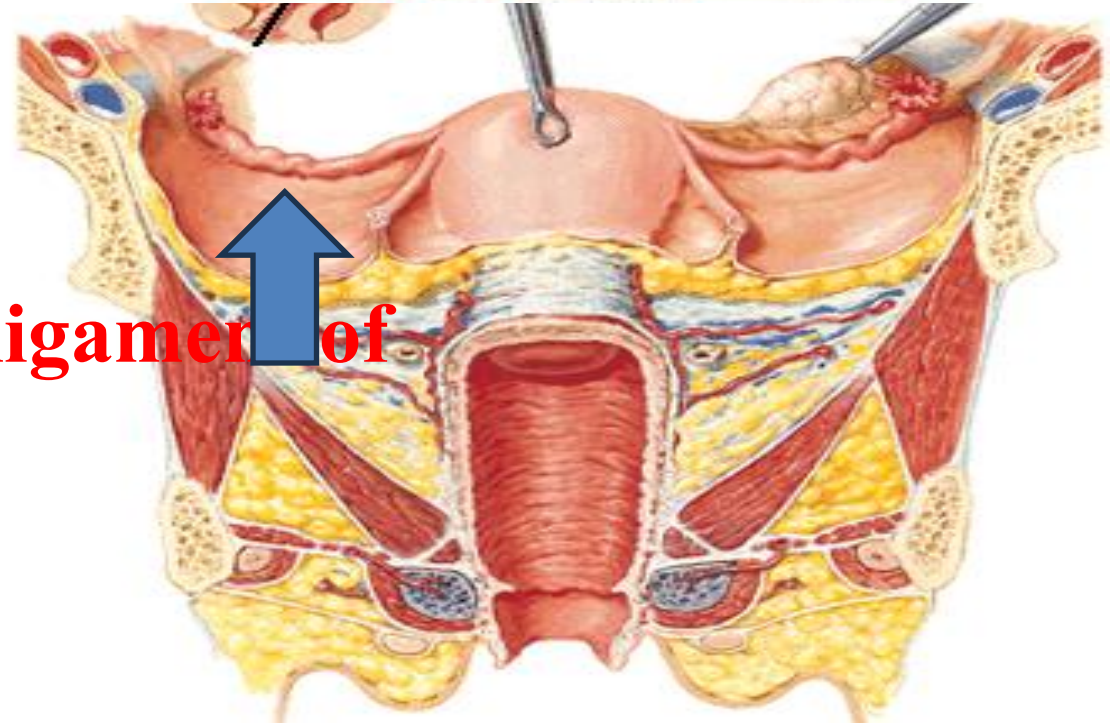
A. Peritoneal ligaments:

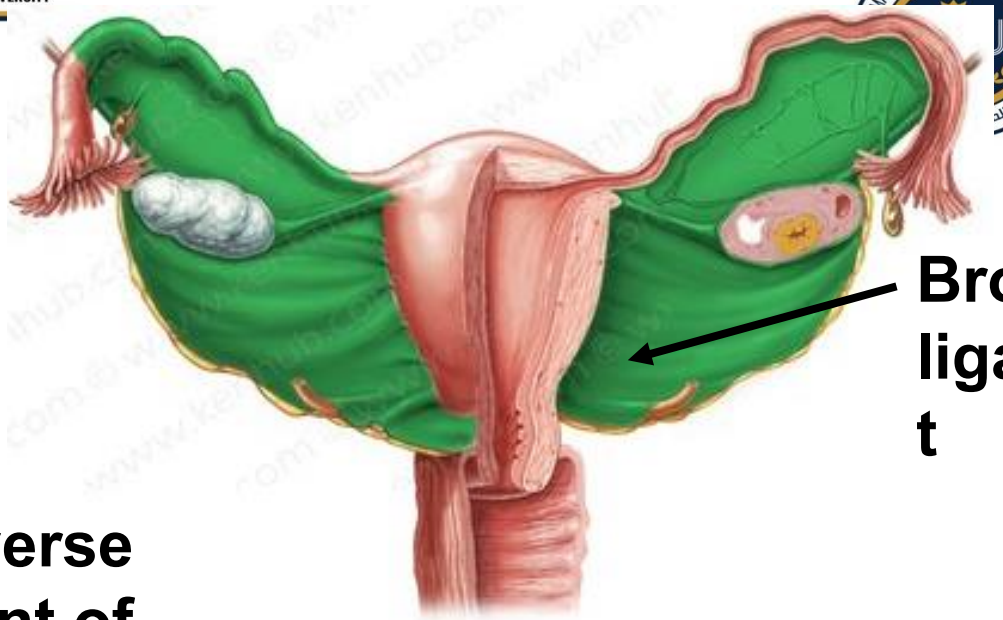
1. Broad ligament of uterus.
2. Anterior ligament (uterovesical ligament).
3. Posterior ligament (rectovaginal ligament).



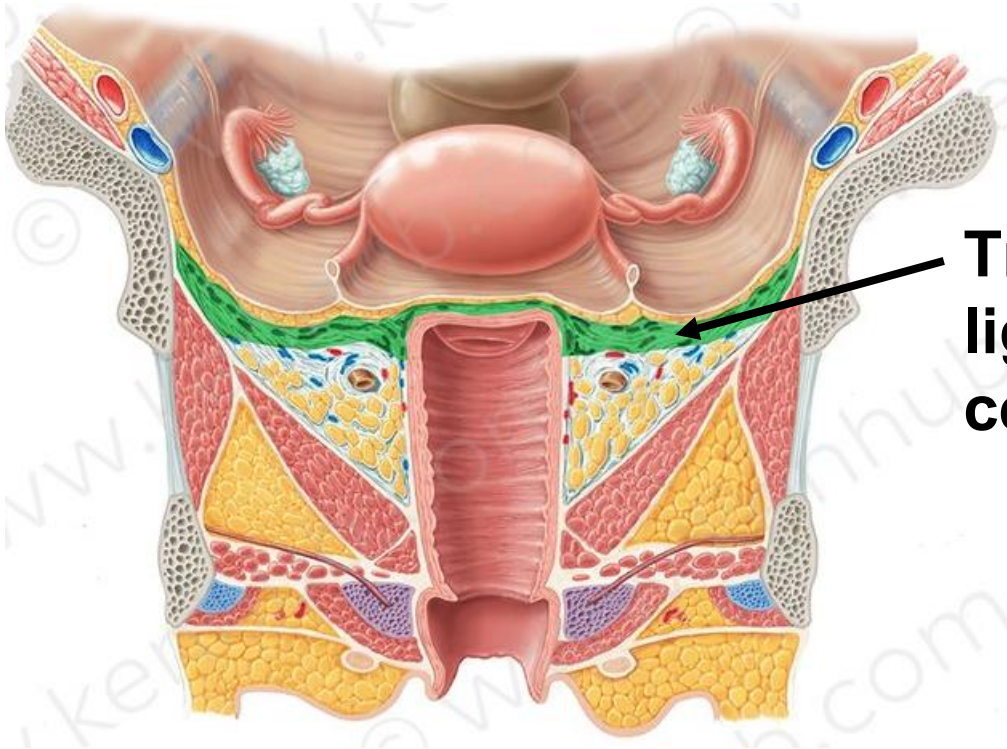
B. Non-peritoneal ligaments:

1. Round ligament of uterus.
2. Ovarian ligament.
3. Mackenrodt's ligaments, transverse ligament of cervix.
4. Right & left utero-sacral ligament.

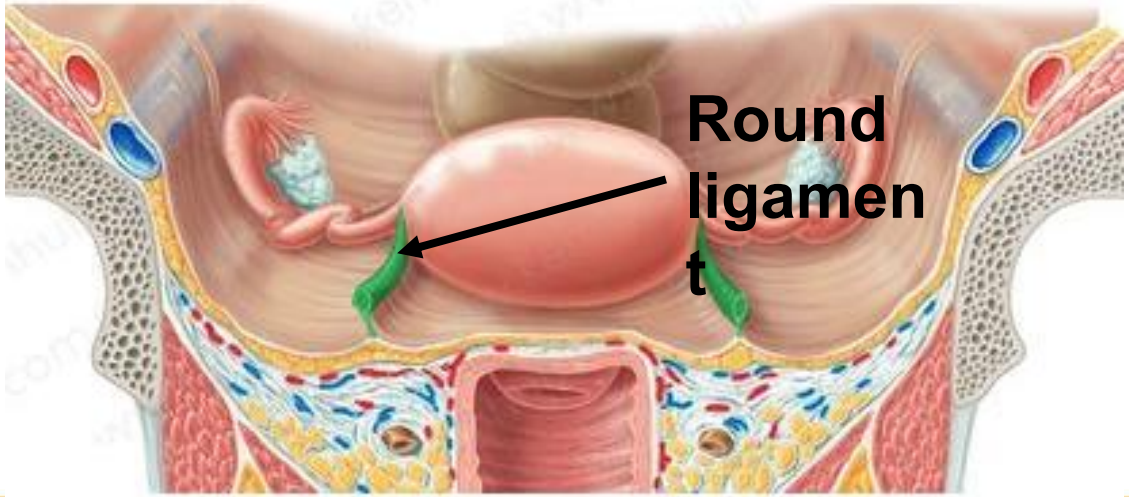




Broad ligament



Transverse ligament of cervix

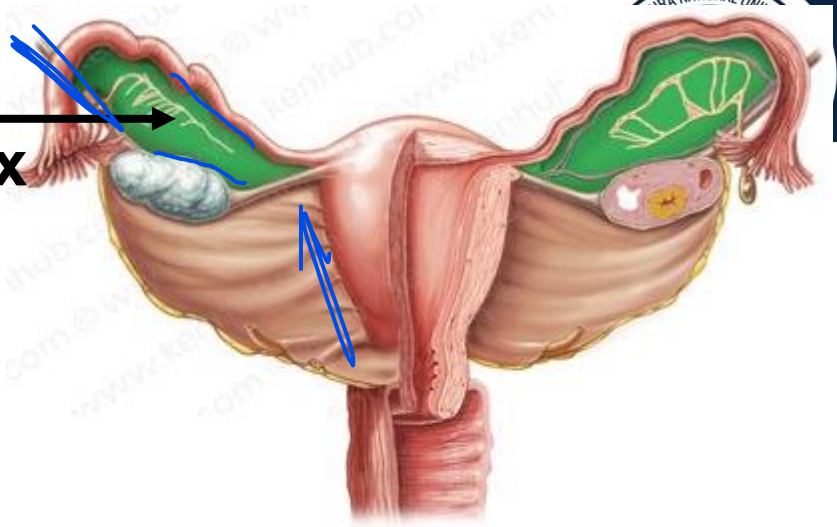


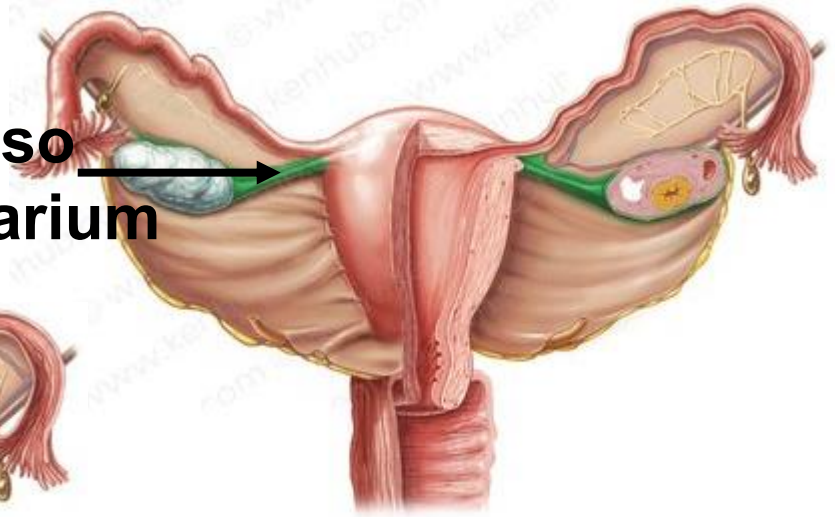
Round ligament

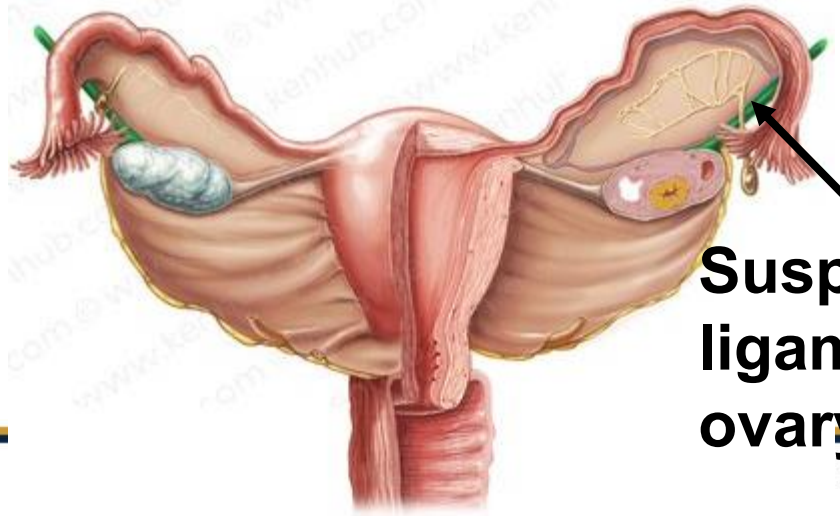
SAQ

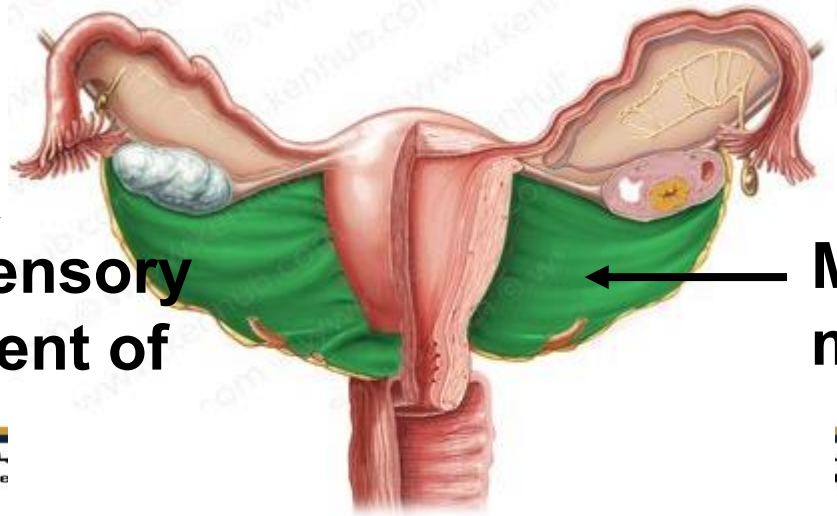
Parts of the broad ligament:

1. Meso salpinx
2. Meso ovarium.
3. Meso metrium.
4. Suspensory ligament of the ovary.









Contents

1. Uterine tube: running in the medial four-fifth of the free border of the broad ligament.

2. Ligaments:

a. Ovarian ligament: between cornu of the uterus and the ovary.

b. Round ligament of the uterus: between cornu of the uterus and labia majora.

3. Vessels;

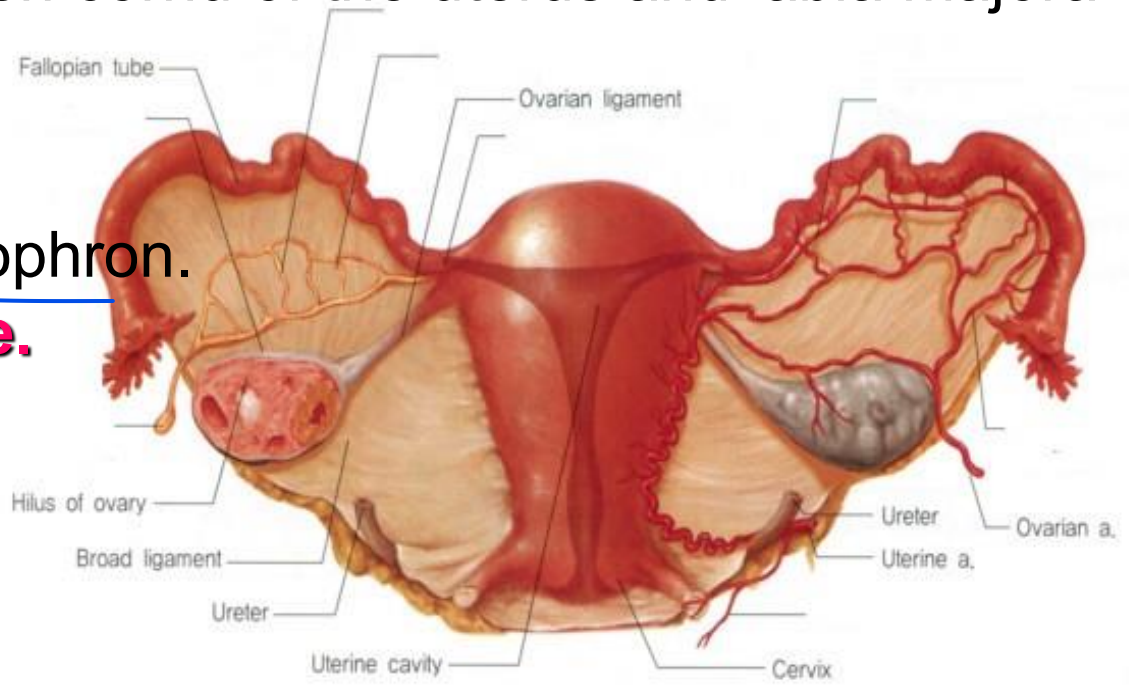
a. Uterine artery.

b. Ovarian artery.

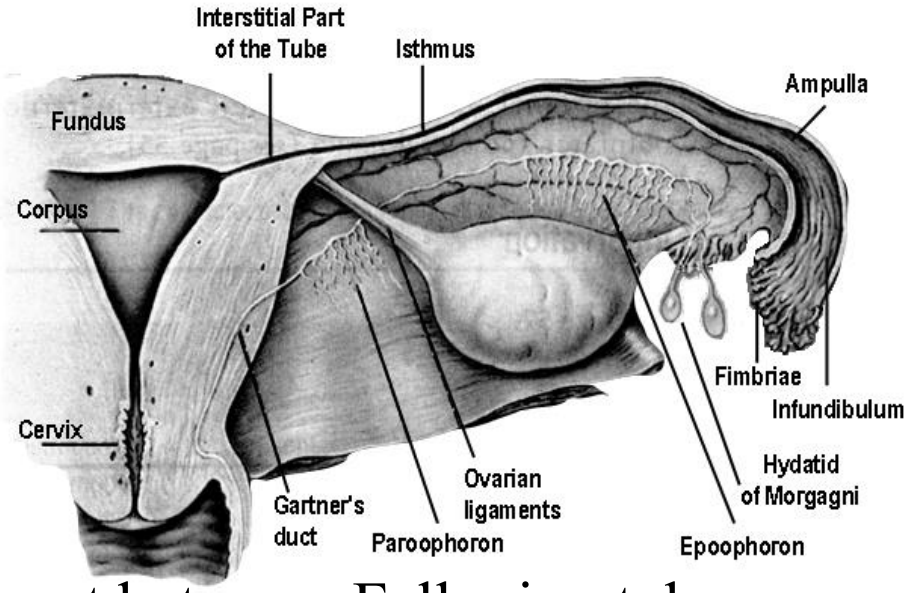
4. Embryonic remnants: epoophron and paraophron.

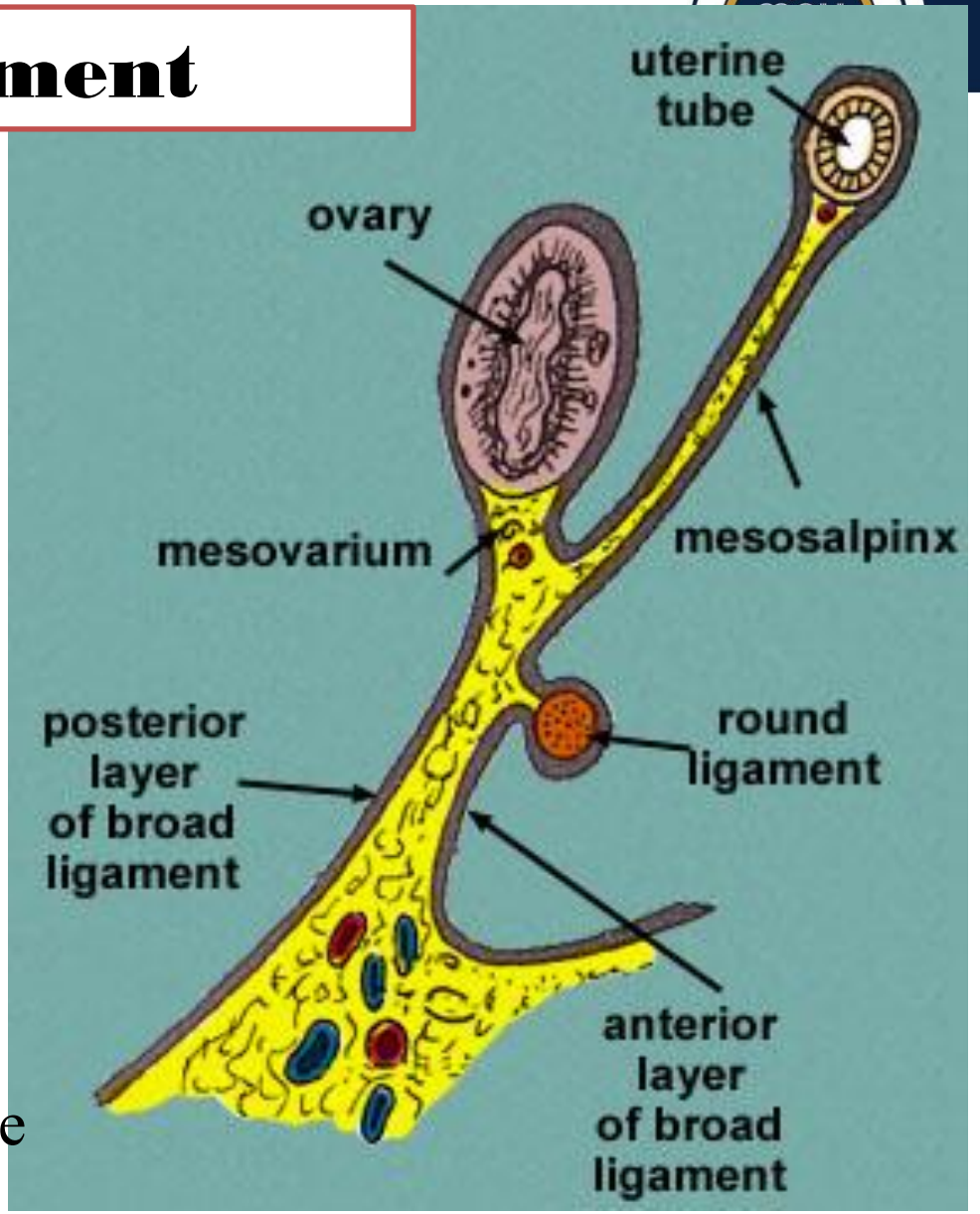
5. Parametrium & extraperitonea! fatty tissue.

6. Sympathetic plexus around the arteries.



Parts of broad ligament





1. **Mesosalpinx:** the part between Fallopian tube & mesovarium & and round ligament of ovary.
2. **Suspensory ligament of ovary:** the part lateral to the ovary.
3. **Mesometrium:** the remaining medial lower part on the side of the uterus.

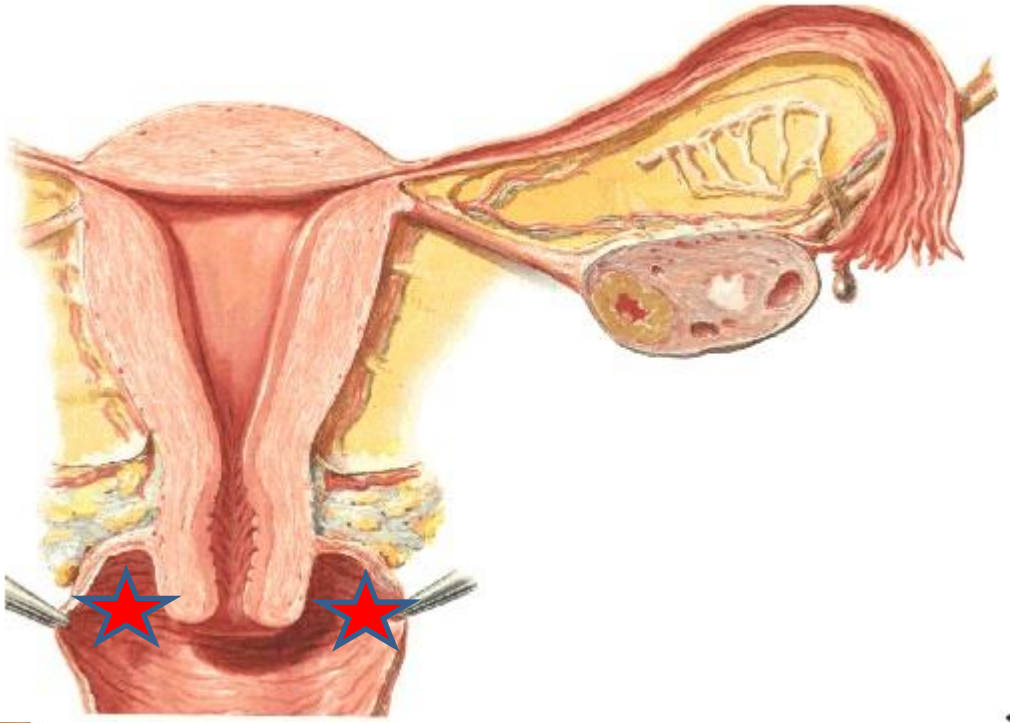
The Vagina

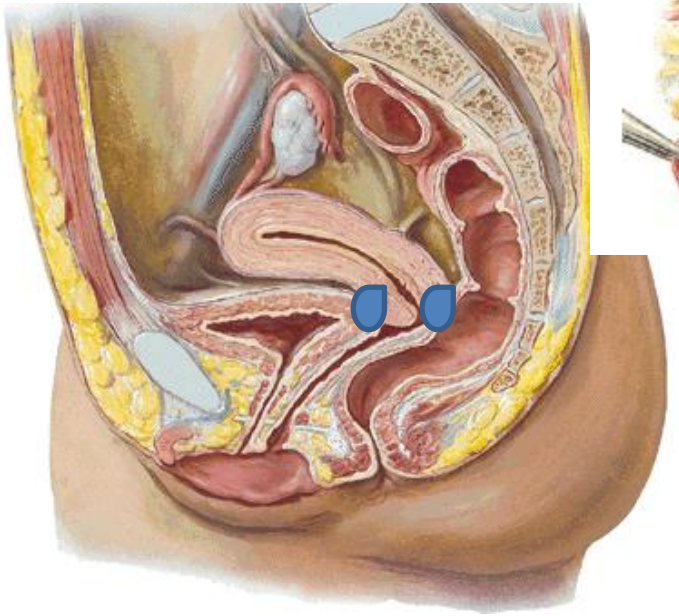
Fornices

Definition: they are the vaginal cavity around vaginal portion of the cervix.

Number: 4: anterior, posterior and two laterals.

The posterior fornix is the deepest one.





The Vagina

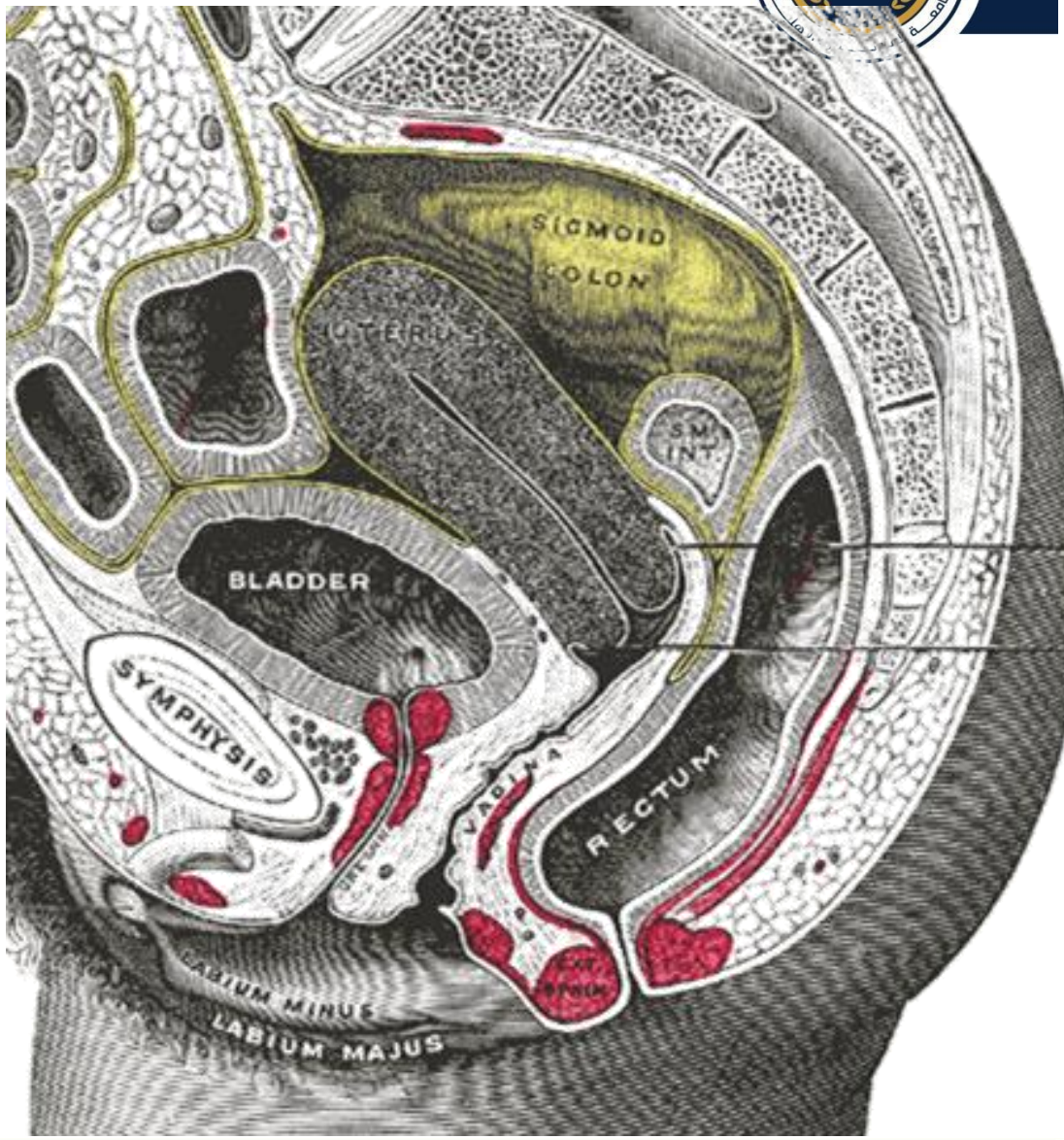
Relations of the Vagina

(A) Anterior wall:

- Upper 1/2: base of the bladder.
- Lower 1/2: urethra.

(B) Posterior wall:

- Upper 1/3: the pouch of Douglas.
- Middle 1/3: the ampulla of the rectum.
- Lower 1/3 : the perineal body which separates it from the anal canal.



The Vagina

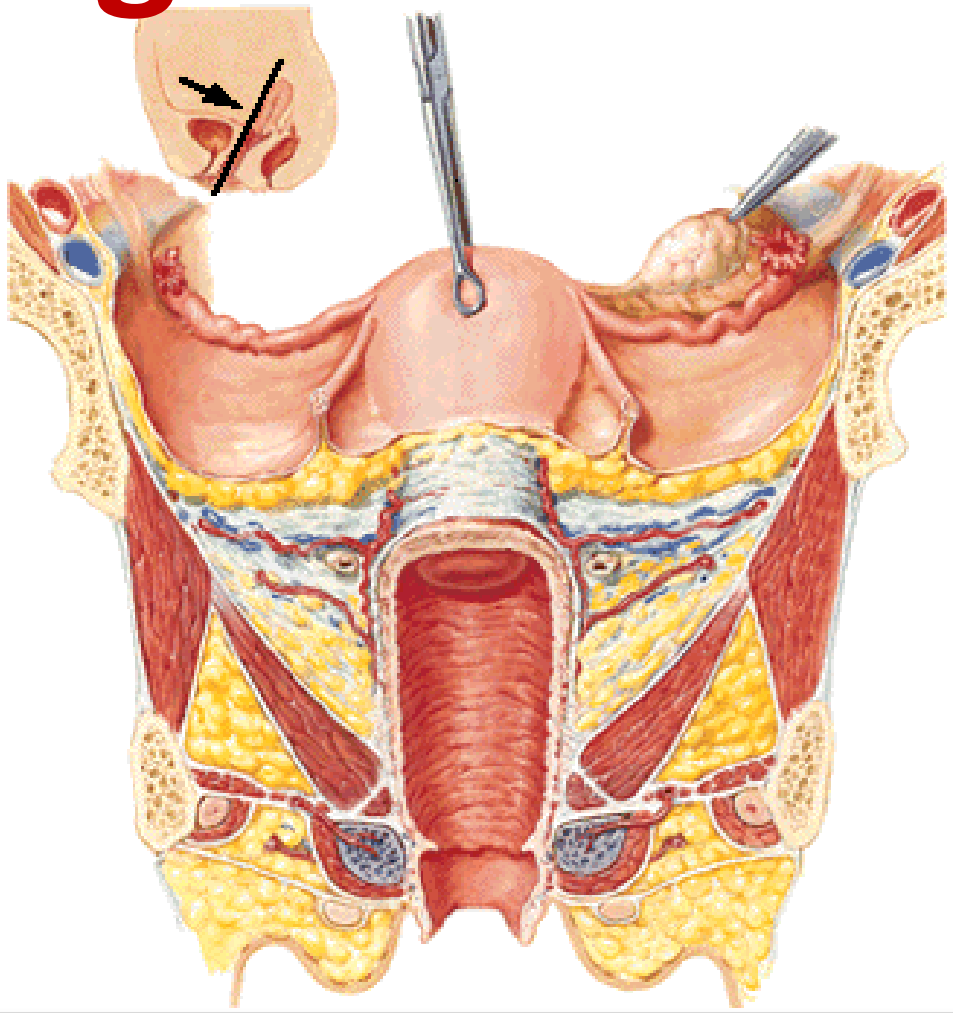
Relations of the Vagina

(C) Lateral walls : on each side:

-**Upper 1/3:** related to the **ureter**.

-**Middle 1/3:** related to the sphincter vaginae which is a part of the levator ani.

-**Lower 1/3:** urogenital diaphragm and the bulbs of the vestibule.

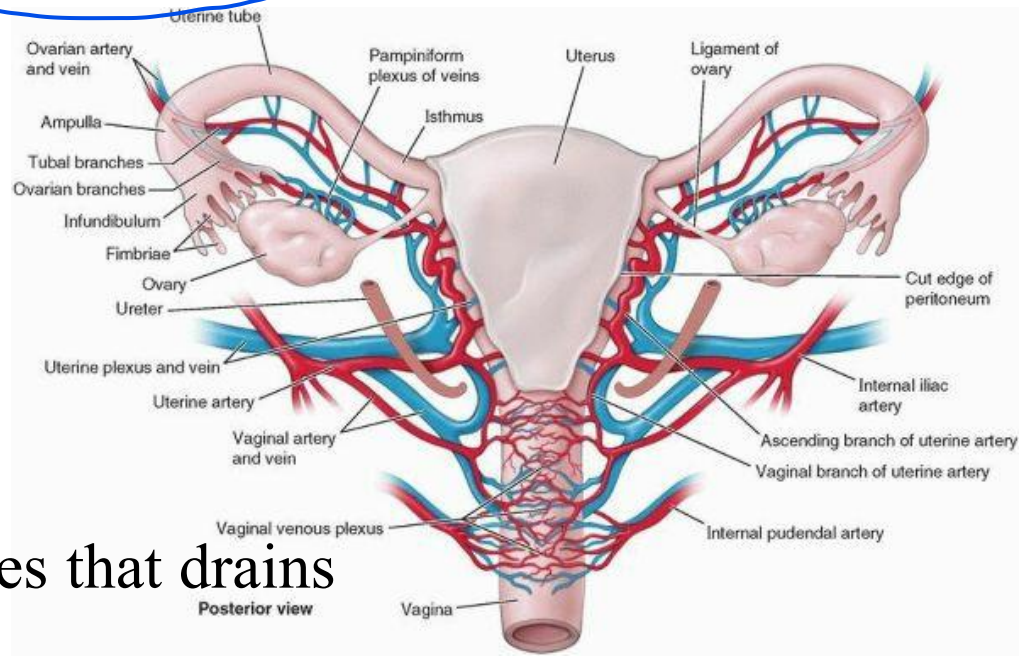


The Vagina

Blood Supply

Arterial supply: 4 arteries anastomose in front & behind the vagina to form anterior & posterior azygos arteries. **They are:**

1. Uterine artery.
2. Vaginal artery.
3. Middle rectal artery.
4. Internal pudendal artery.



Venous drainage: the vaginal veins form plexuses that drains into **internal iliac vein.**

Anatomy of pelvic wall, vessels & nerves

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

By
Dr. Fekry Shata

Muscles of the Pelvis

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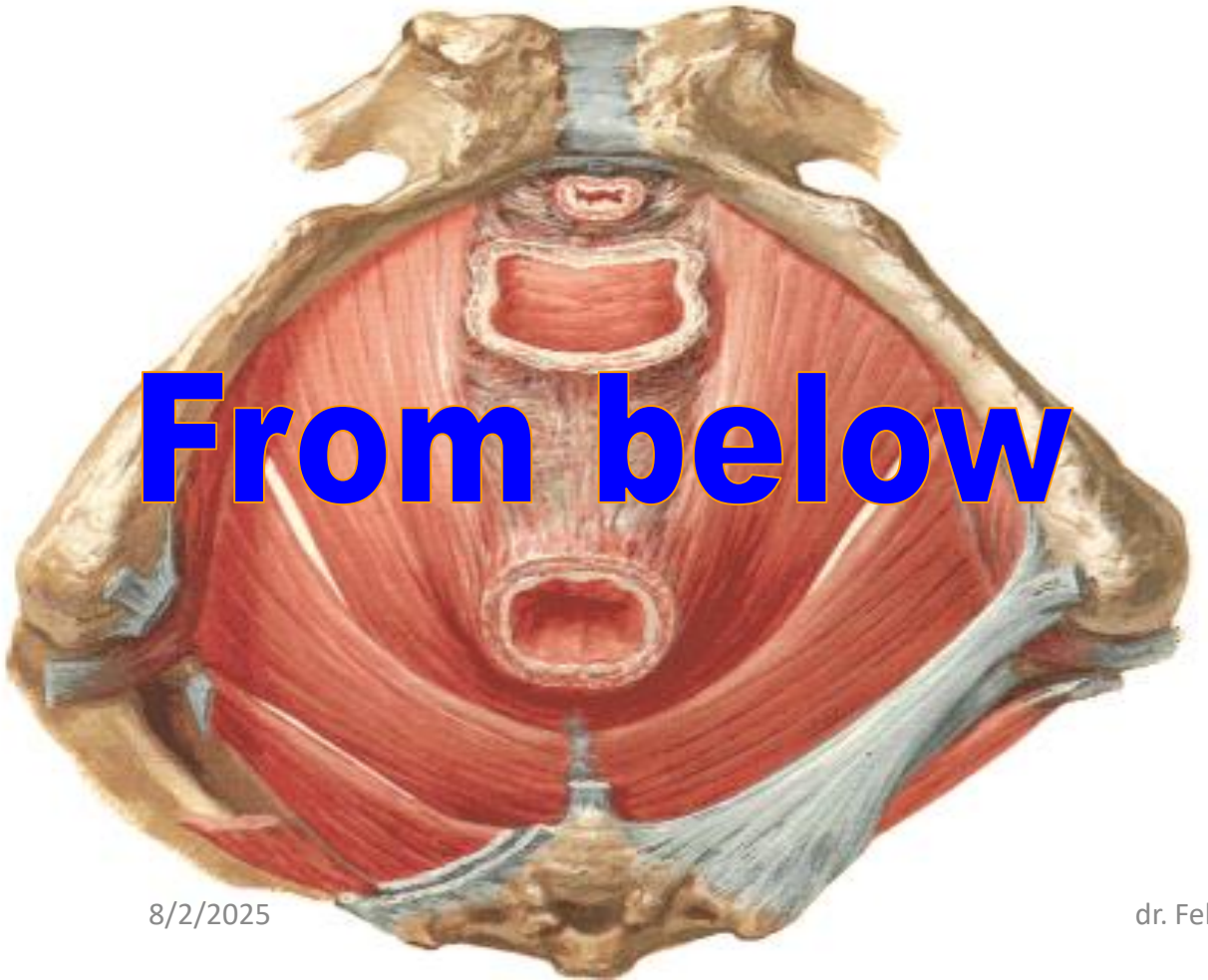
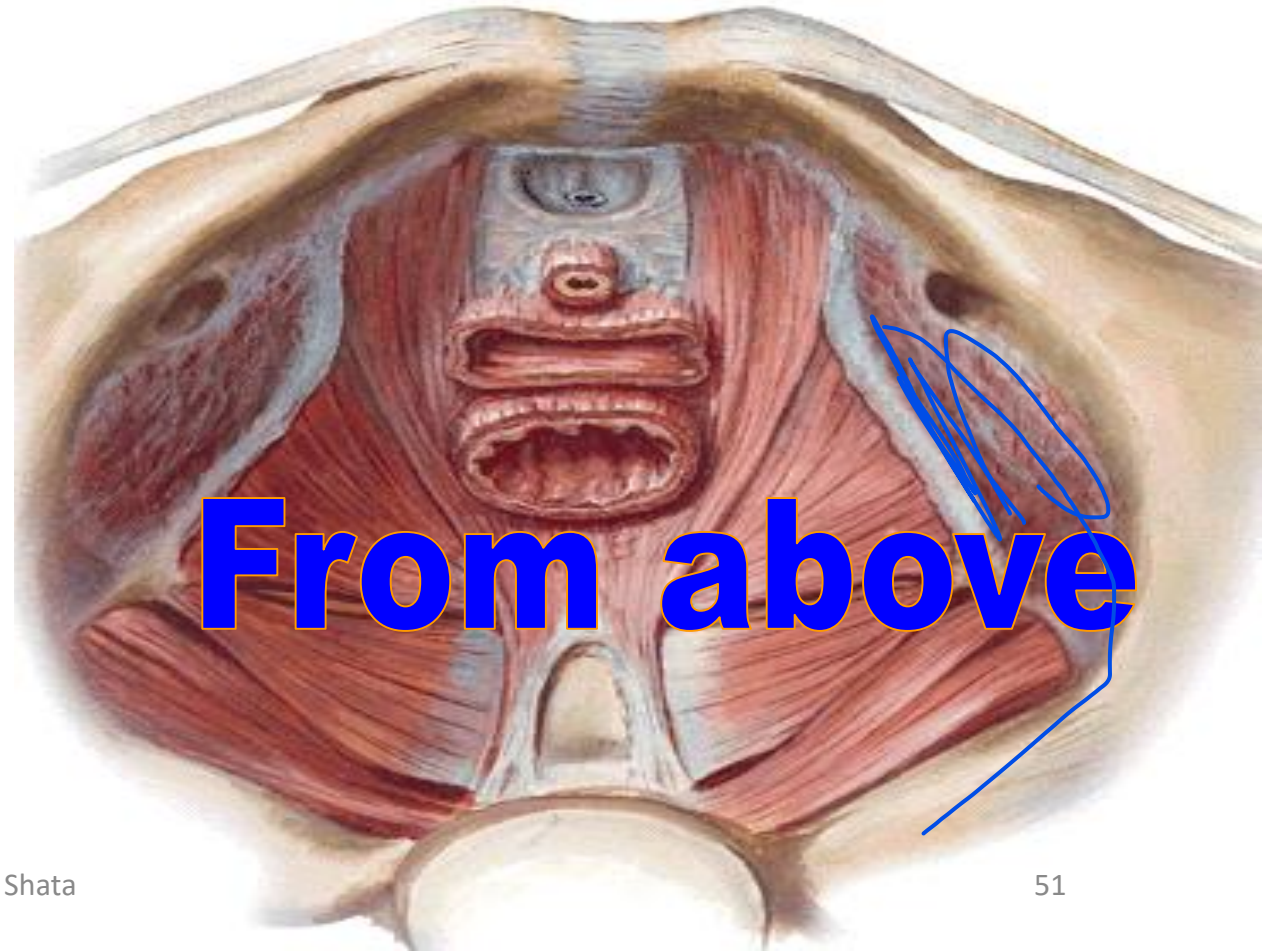
PELVIC FLOOR



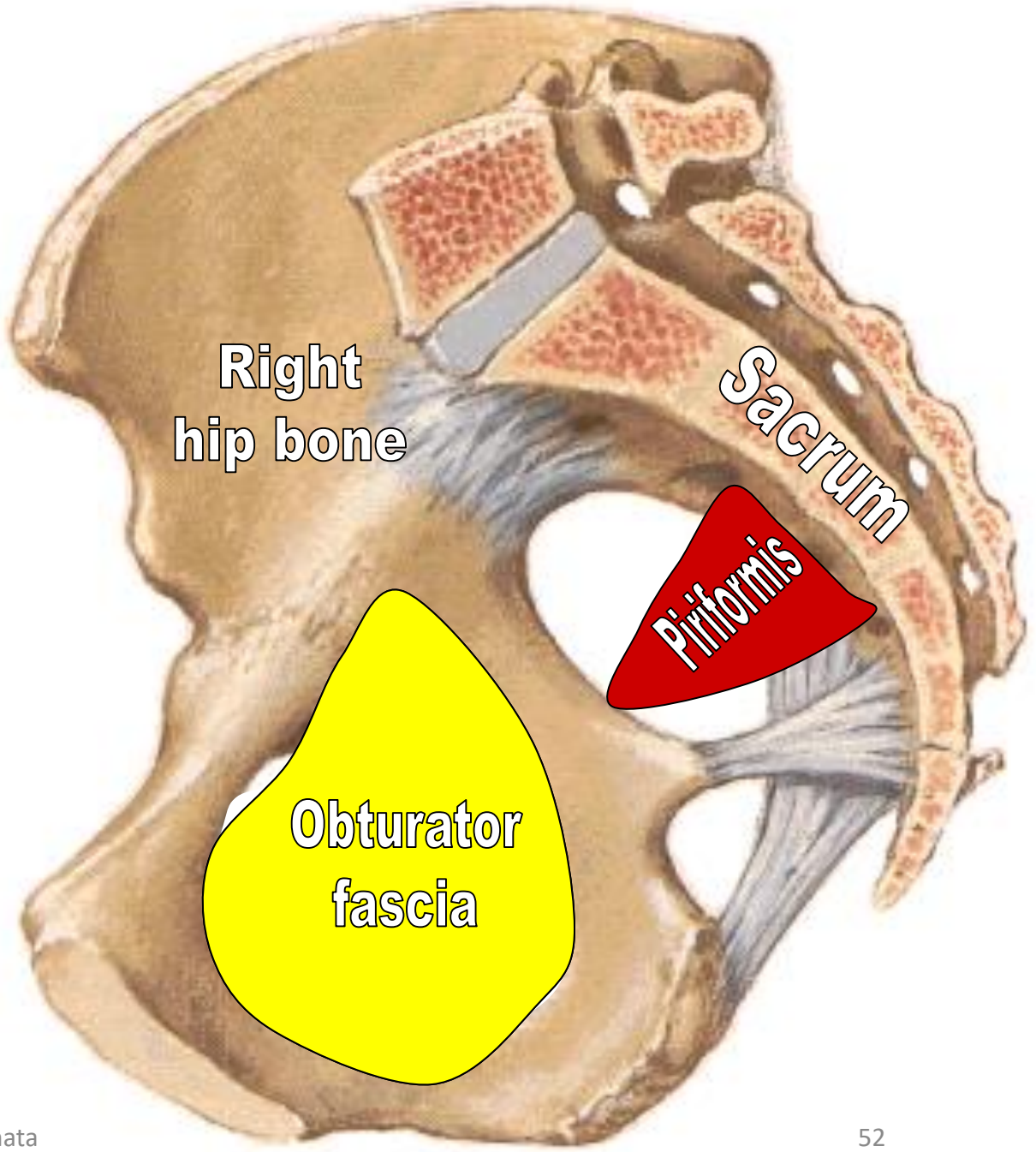


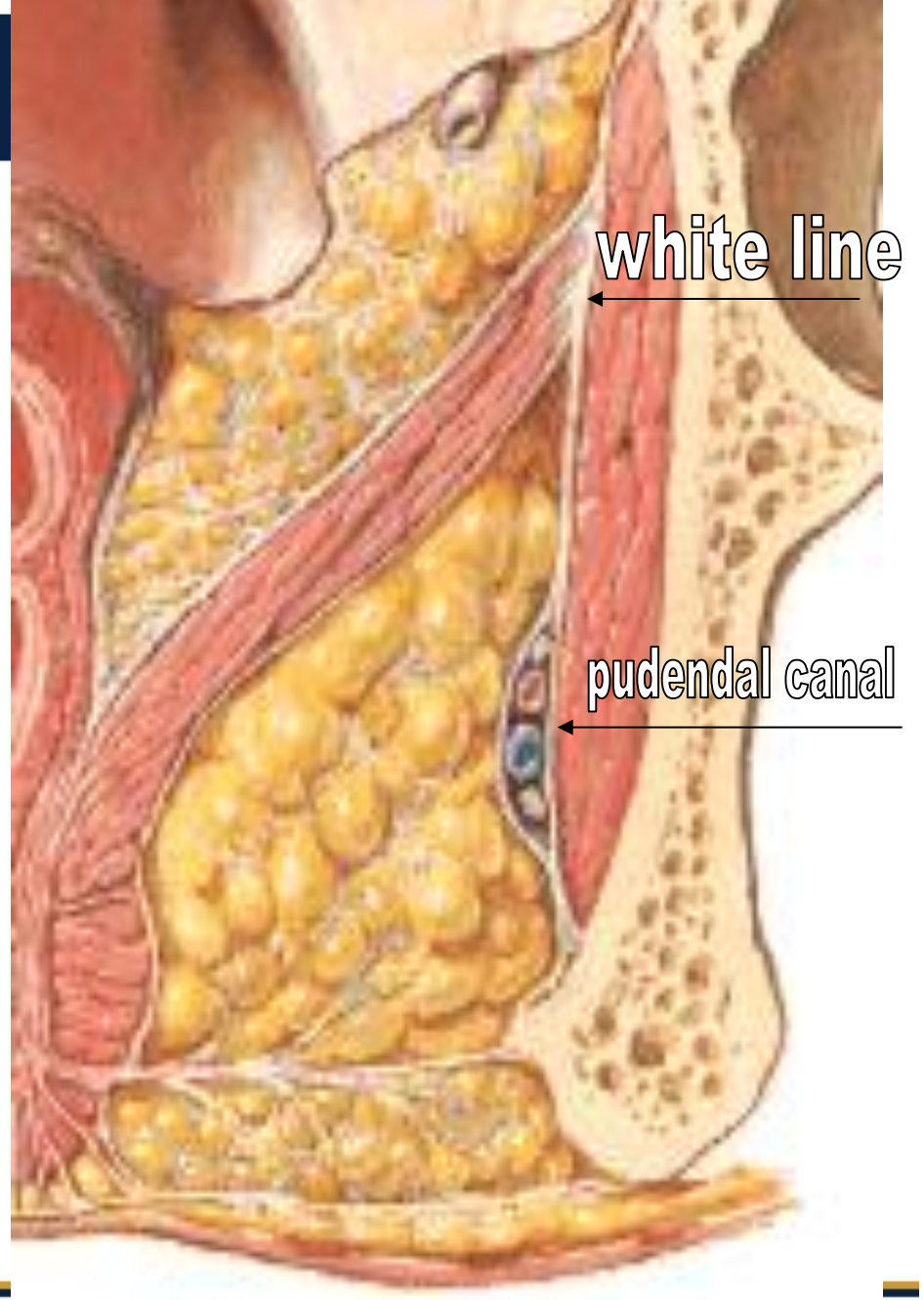
1)-Muscles of the pelvic wall

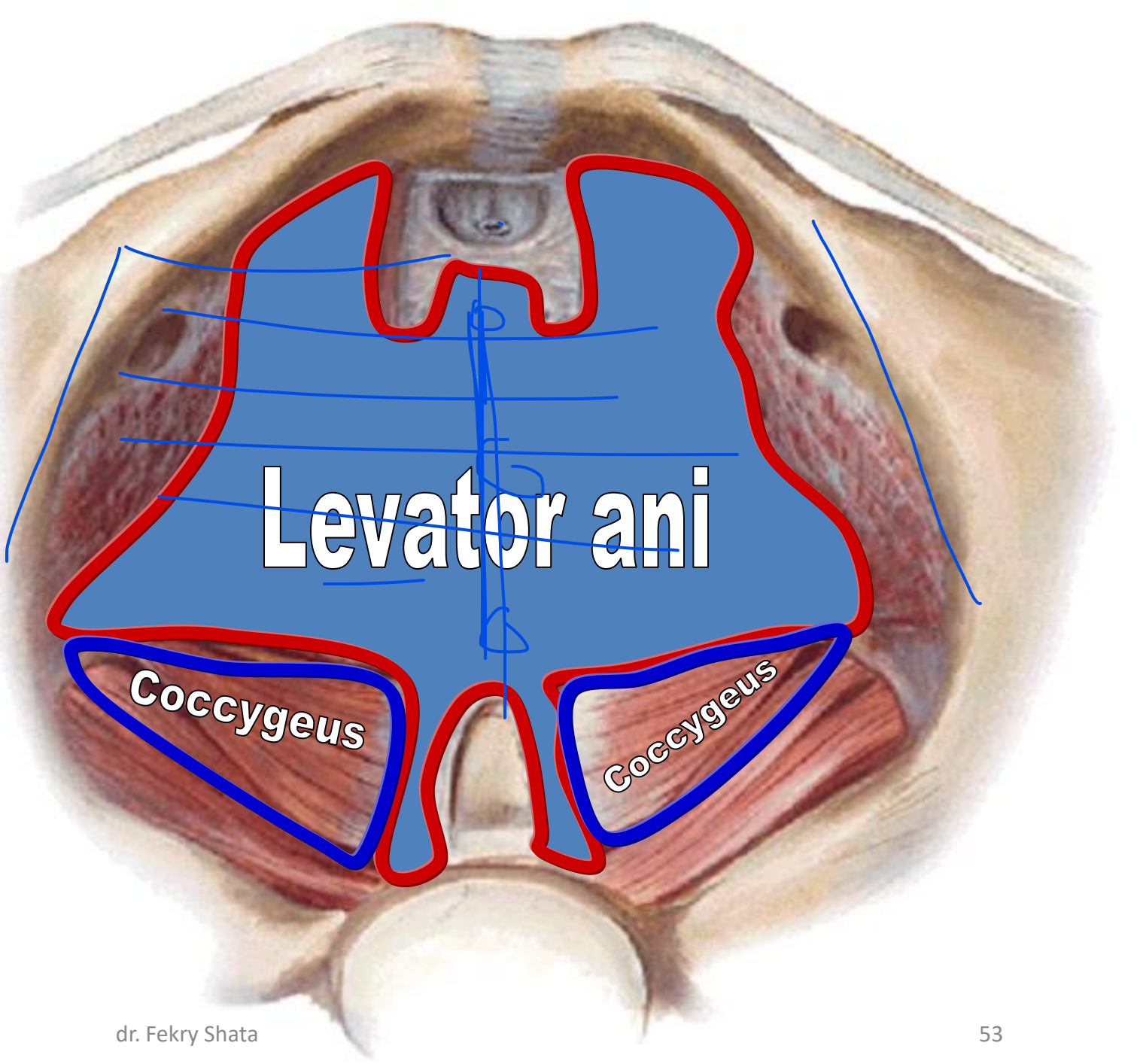
1. Obturator internus.
2. Piriforms.

2)-Muscles of the pelvic floo

1. Levator ani.
2. Coccygeus.




white line
pudendal canal


Levator ani
Coccygeus
Coccygeus

Levator ani

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The Levator ani muscle

SAQ

Origin & insertion: ANATOMICAL PARTS

1. The ischiococcygeus part:

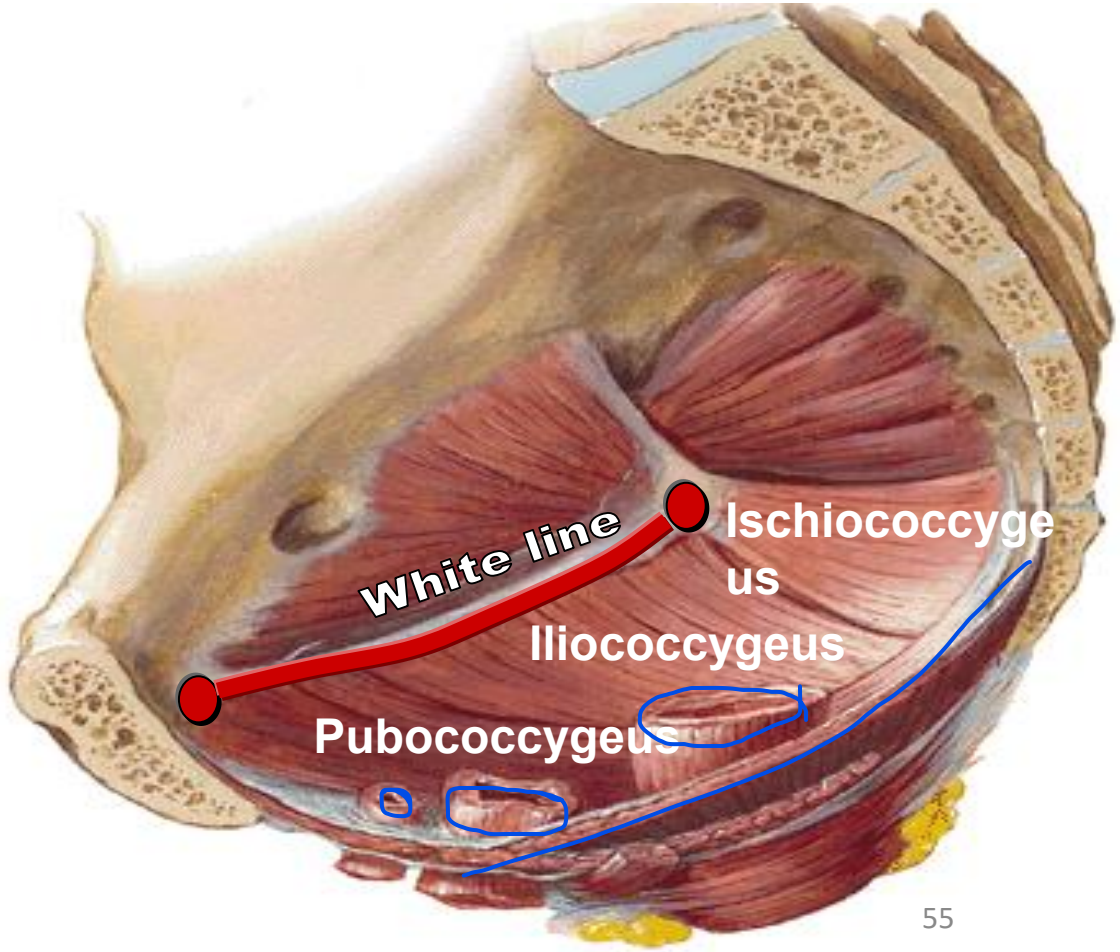
Origin from the ischial spine
Inserted into the front of the coccyx.

2. The iliococcygeus:

Origin from the “white line” on the lateral Wall of the pelvis,
inserted into tip of the coccyx and raphe

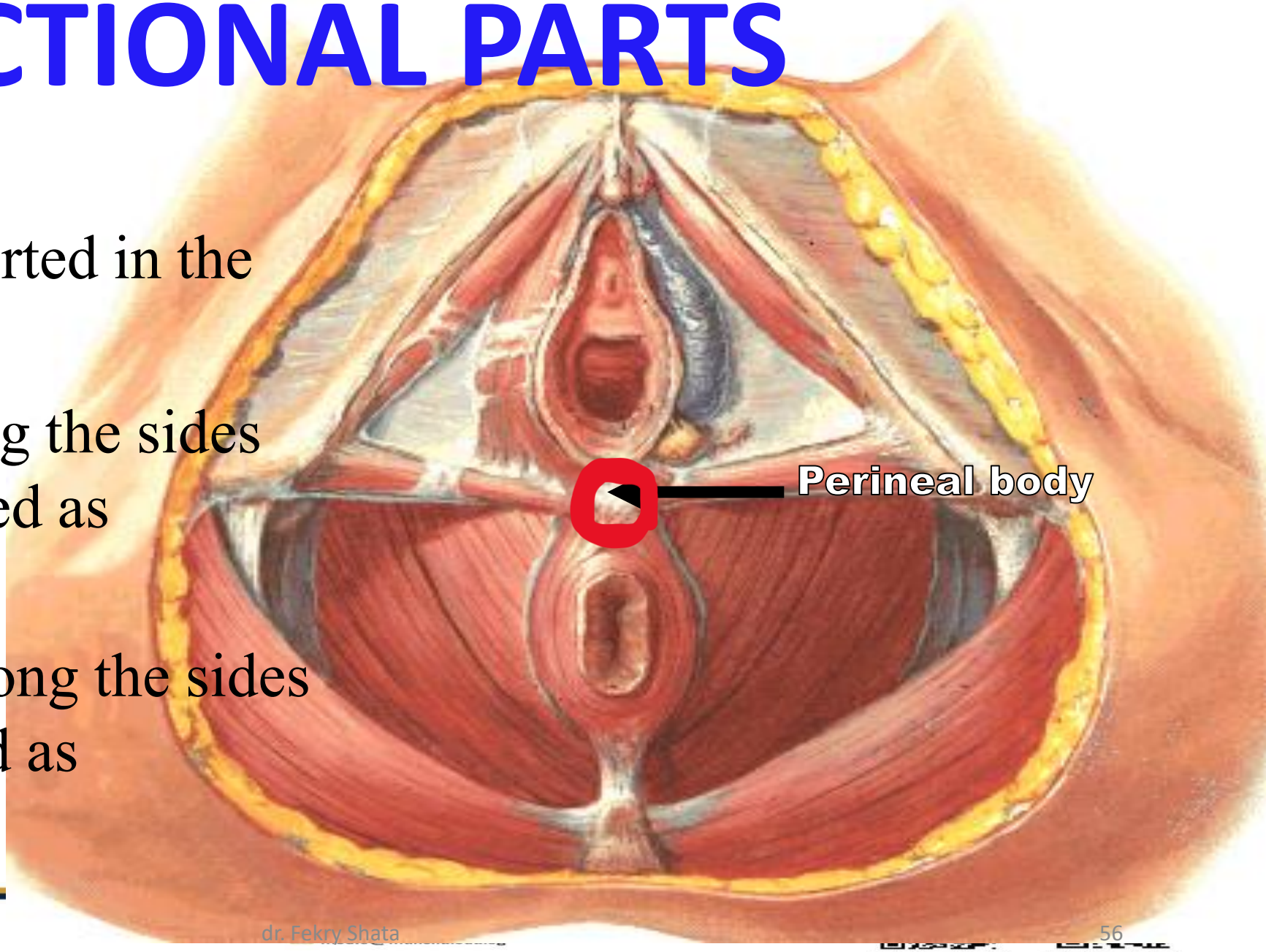
3. The pubococcygeus

Origin from the back of the pubic ramus
Inserted into tip of the coccyx and raphe

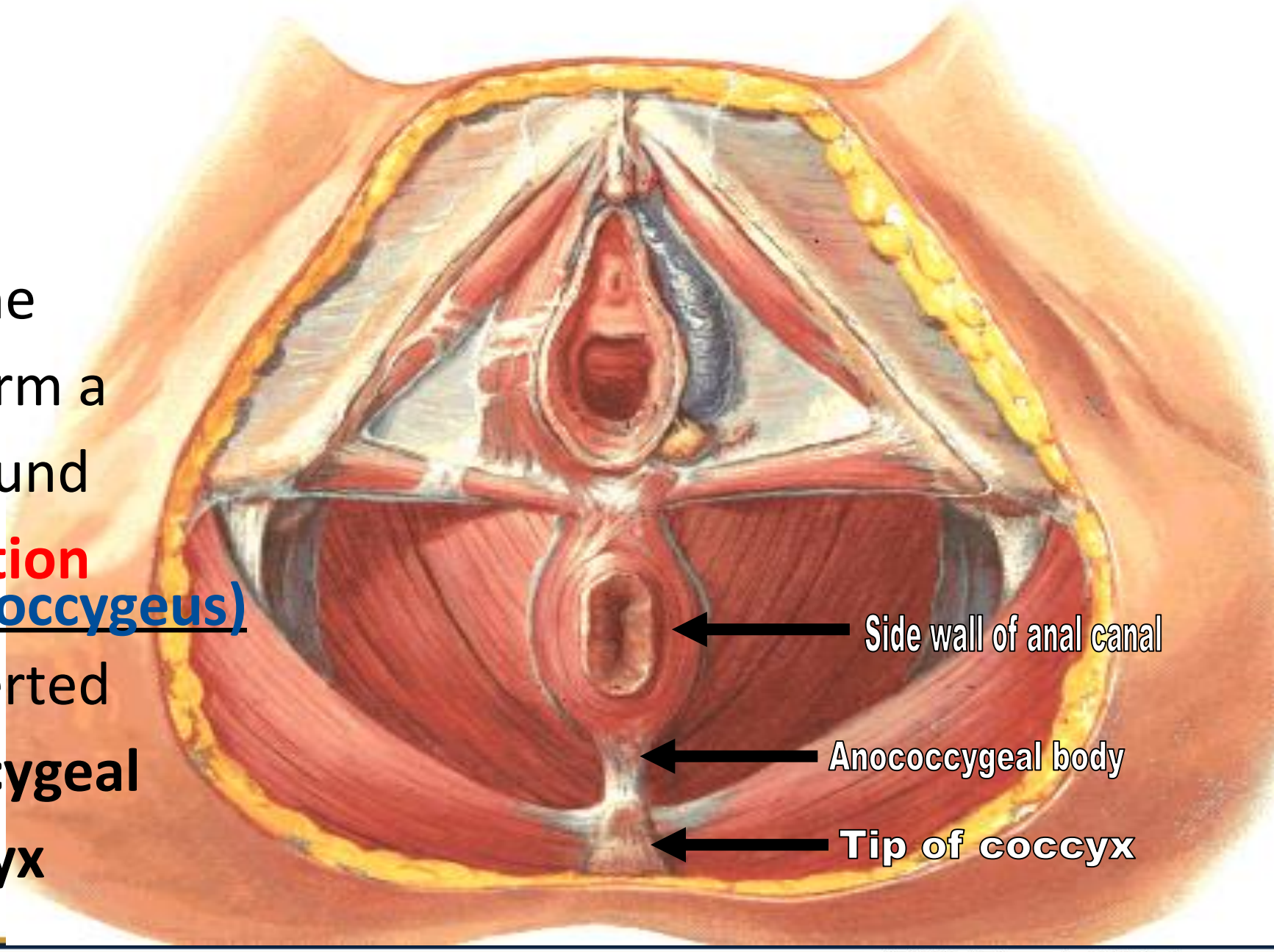


FUNCTIONAL PARTS

- **Anterior fibers:**
  - Fibers that are inserted in the **perineal body**
    - in male it passes along the sides of prostate, it is termed as ***levator prostate***
    - in female it passes along the sides of vagina, it is termed as ***sphincter vaginae***



- **Intermediate fibers (puborectalis)**
  - Join the fibers of the opposite side to form a **U-shaped** loop around the **anorectal junction**
- **Posterior fibers (iliococcygeus)**
  - Fibers that are inserted in the into **anococcygeal body and the coccyx**



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Actions of Levator Ani

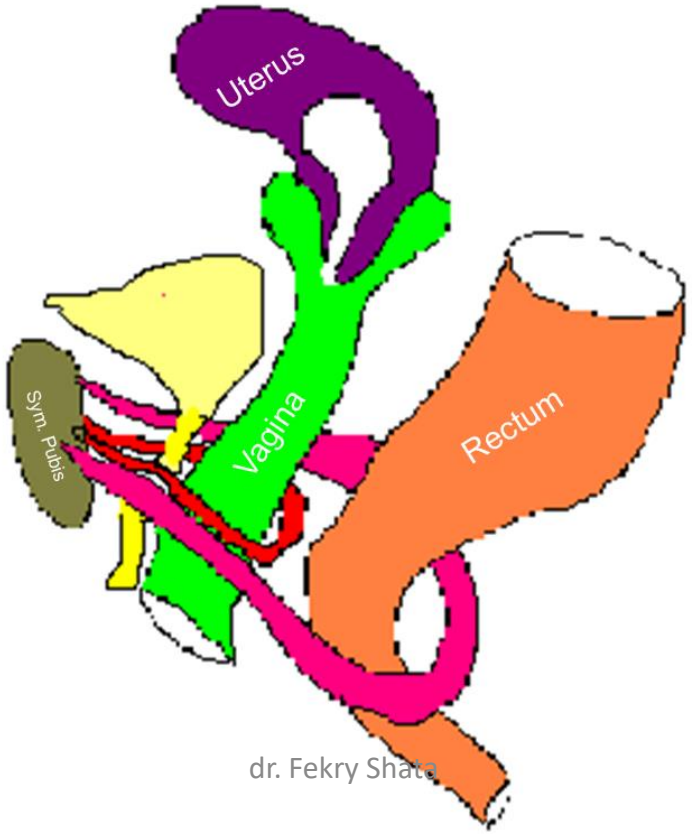
1. **Supports the pelvic viscera** in its position, levator prostatae
2. **Raising intra-abdominal pressure** in forced expiration and during defecation, cough, vomiting etc.
3- Have an **important sphincter action**: pubourethralis, sphincter vaginae, and puborectalis

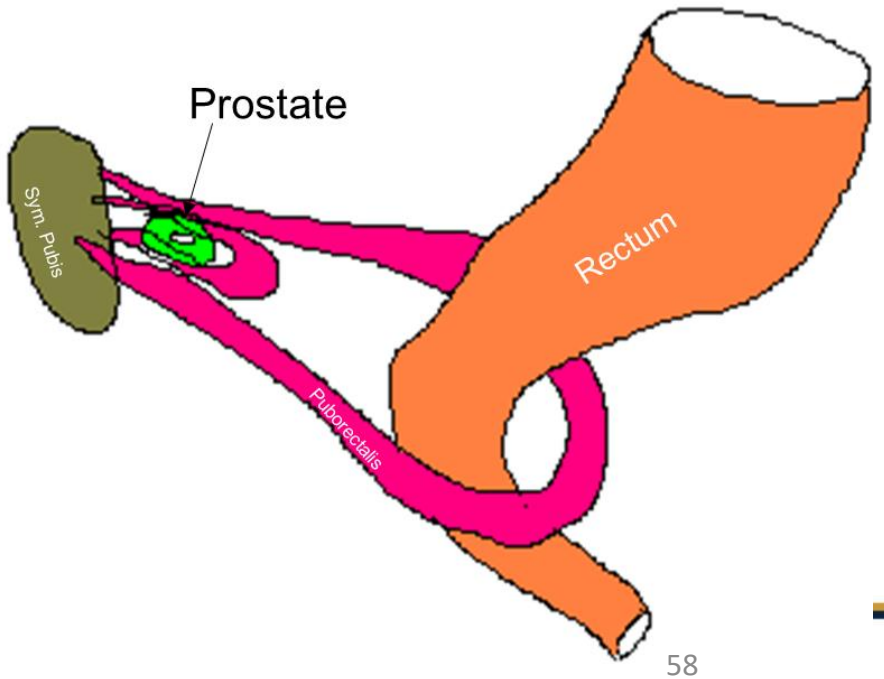
Nerve supply

1. Pelvic surface: by a branch from **S4**. MCQ

2. Perineal surface:

Pudendal nerve





Vessels & Nerves of the Pelvis

Arteries of the Pelvis

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1. Internal Iliac Artery

ORIGIN:-

=One of two terminal branches of common iliac artery.

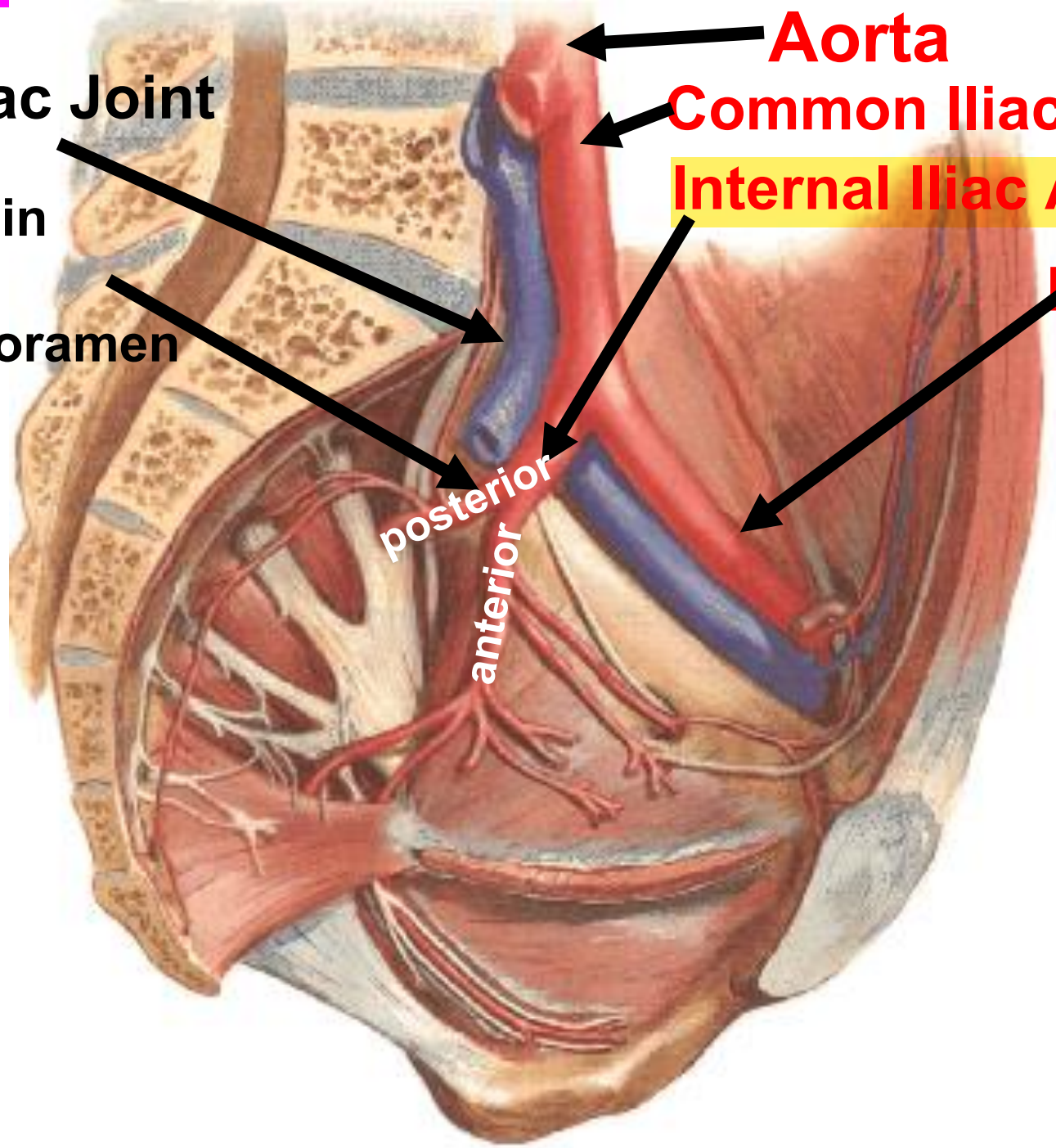
=At level of sacra-iliac joint.

TERMINATION:- at upper margin of greater sciatic foramen by dividing into:-

1-Anterior division.

2-Posterior division.

COURSE:- descend on the posterior wall of pelvis.


Sacro-iliac Joint
Upper margin
of
Greater Sciatic Foramen
Aorta
Common Iliac Artery
Internal Iliac Artery
External Iliac Artery
posterior
anterior

BRANCHES

Anterior division		Posterior division
Parietal branches [supply the wall of pelvis]	**Visceral branches** [supply the viscera of pelvis]	**All are Parietal branches**
1.Internal pudendal artery. 2.Obturator artery. 3.Inferior gluteal artery. (continuation)	1.Umbilical (superior vesical) 2.Middle rectal artery. 3.Inferior vesical artery. (only male) 4.Uterine artery. (only female) 5.Vaginal artery. (only female)	1.Lateral sacral artery. 2.Iliolumbar artery. 3.Superior gluteal artery. (continuation)

Internal pudendal artery

Origin: It is a one of the two, terminal branches of anterior division of the internal iliac artery MCQ

Course: accompany the pudendal nerve

Branches

In female	In male
1. Inferior rectal artery	1. Inferior rectal artery
2. Two labial arteries	2. Two scrotal arteries.
3. Artery of the bulb of clitoris	3. Artery of the bulb of penis
4. Deep and dorsal arteries of clitoris	4. Deep and dorsal arteries of penis

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Veins of the Pelvis

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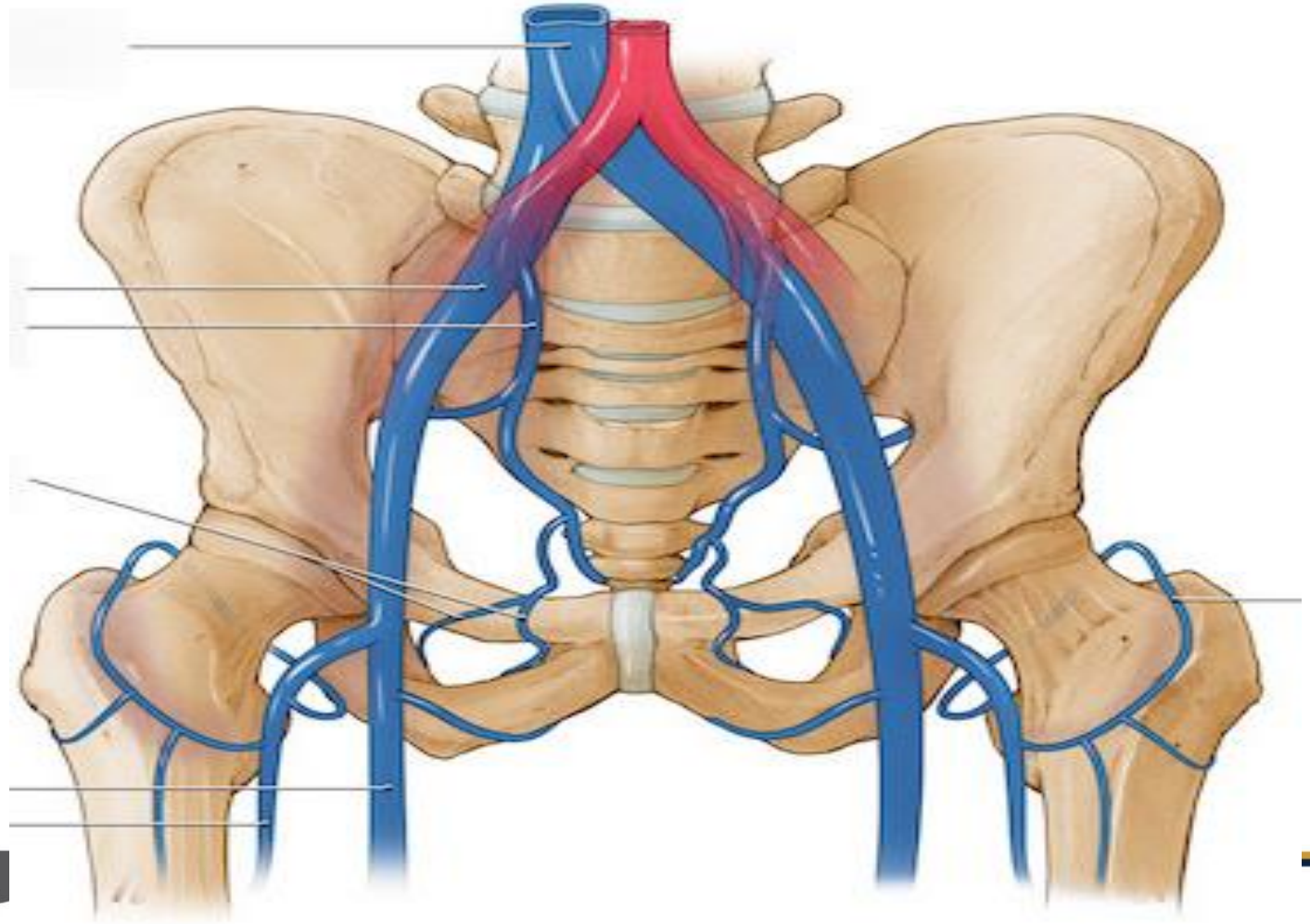
Veins of the Pelvis



Veins of the Pelvis

External iliac vein	**Beginning**: femoral veins Main **tributaries**: inferior epigastric, deep circumflex iliac, pubic veins **Drains** to: common iliac vein
Internal iliac vein	**Beginning**: deep veins of the pelvis and thigh **Tributaries**: middle rectal, obturator, lateral sacral, inferior gluteal, superior gluteal veins **Drains** to: common iliac vein
Common iliac vein	**Beginning**: internal and external iliac veins **Tributaries**: internal pudendal, median sacral veins **Drains** to: inferior vena cava

Pudendal nerve

MCQ

Origin: It is a one of the two terminal branches of the sacral plexus

Course: it crosses the back of sacrospinous ligament to lesser sciatic foramen to enters the **pudendal canal** to end at the deep perineal pouch

Branches:

1. Inferior rectal nerve: to levator ani and external anal sphincter.
2. Perineal nerve: to the skin of scrotum or labia majora.
3. Dorsal nerve of penis.

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The Perineum

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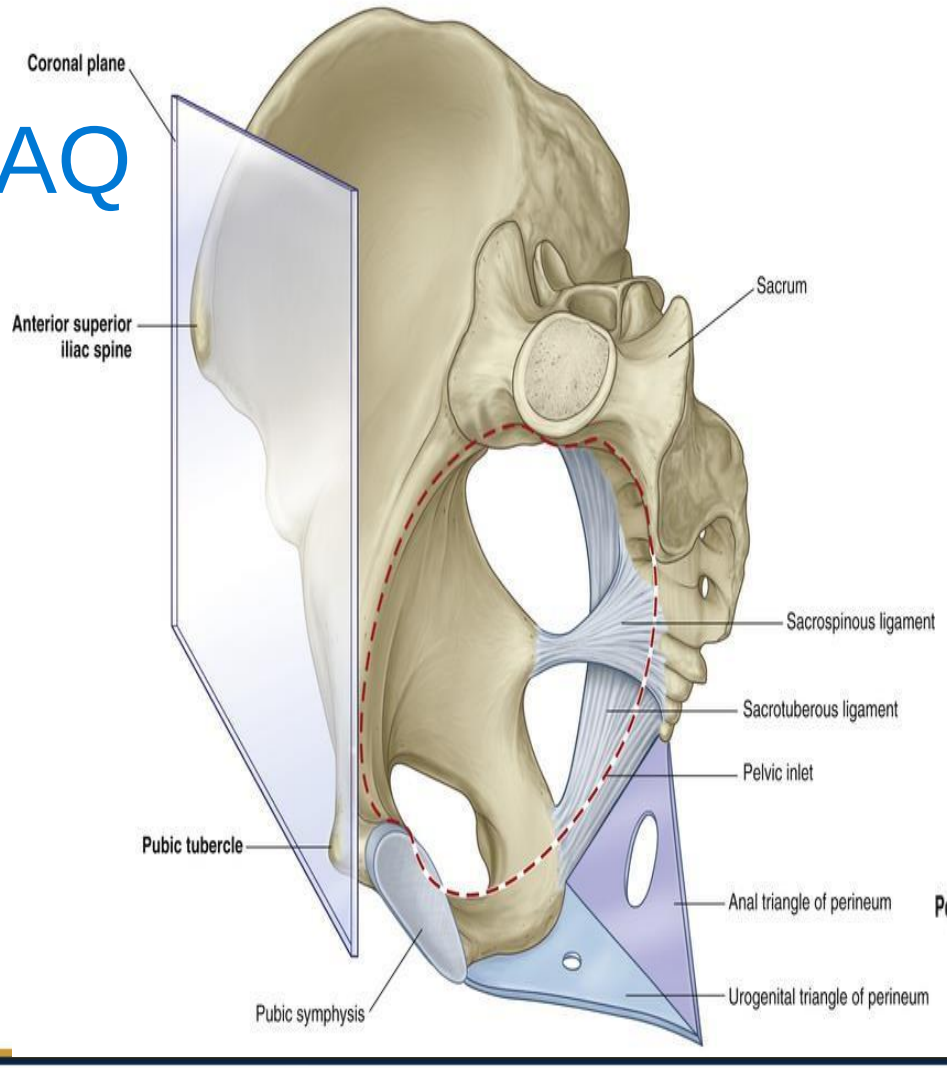
Faculty of Medicine
Mansoura National University, Egypt

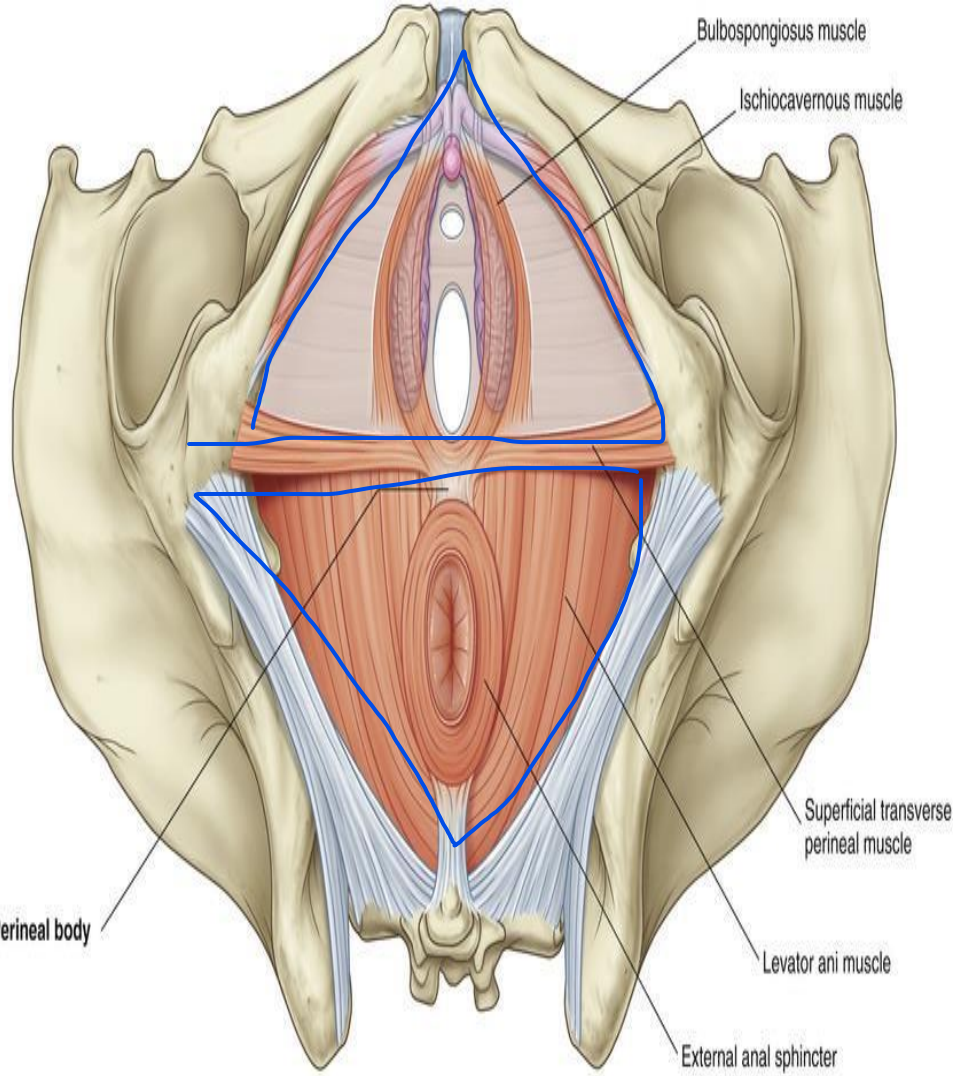
THE PERINEUM

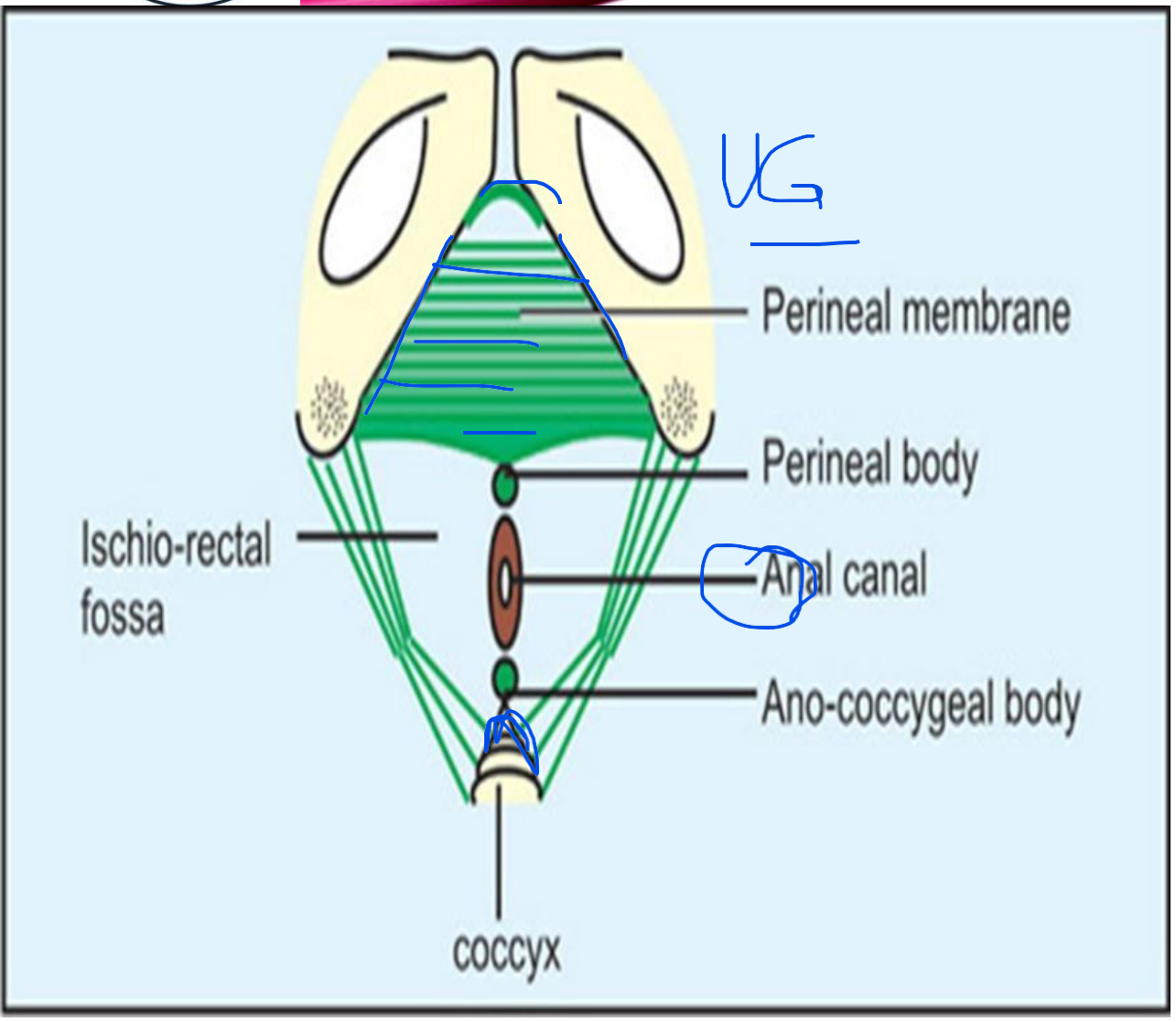
Divisions: by a line between 2 ischial tuberosities into:

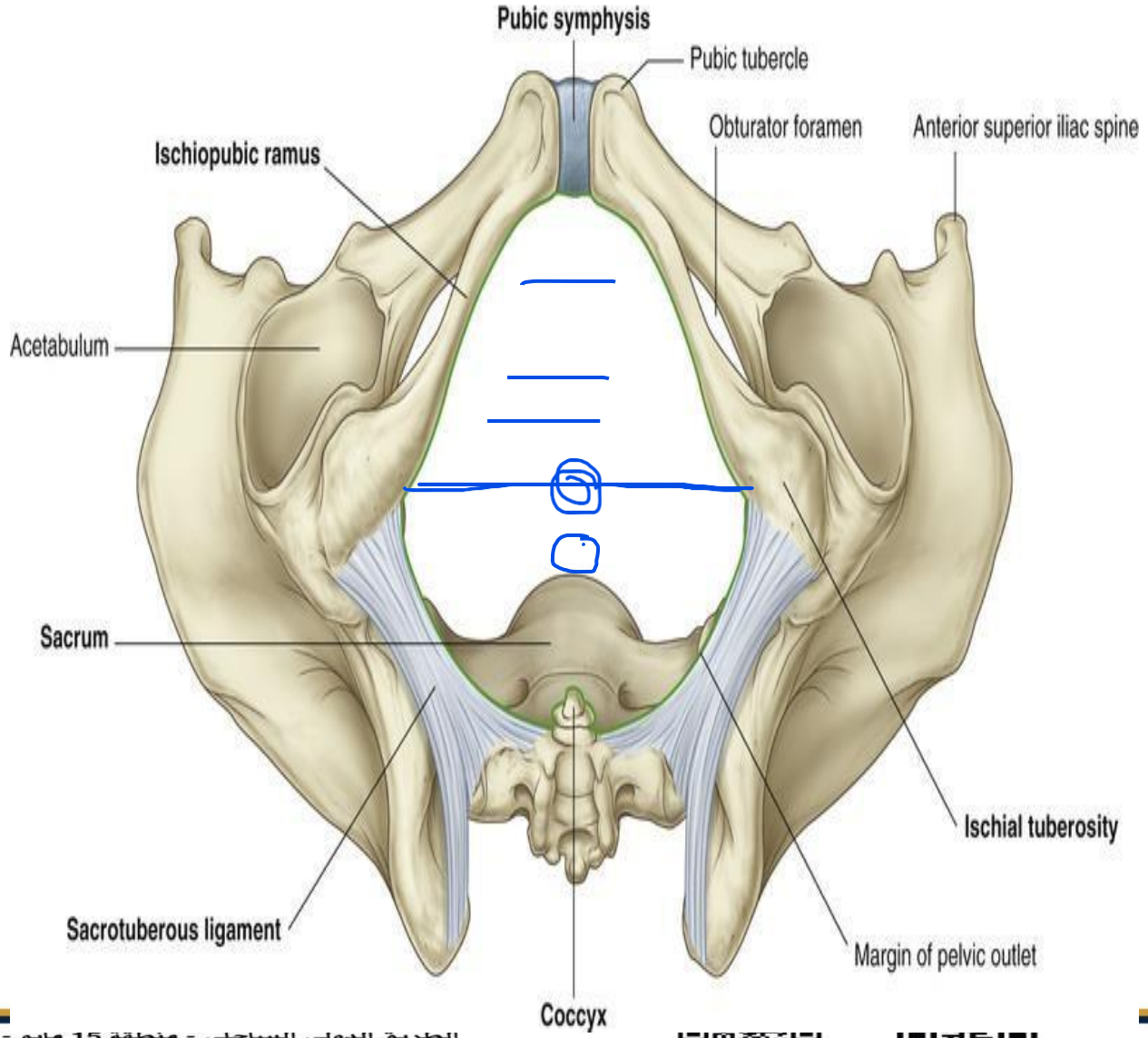
SAQ

- **Urogenital triangle: (anterior):** contain 2 Perineal Pouches and External Genitalia.
- **Anal triangle: (posterior):** contain anal canal & ischiorectal fossa.






Perineal membrane
Perineal body
Ischio-rectal fossa
Anal canal
Ano-coccygeal body
coccyx

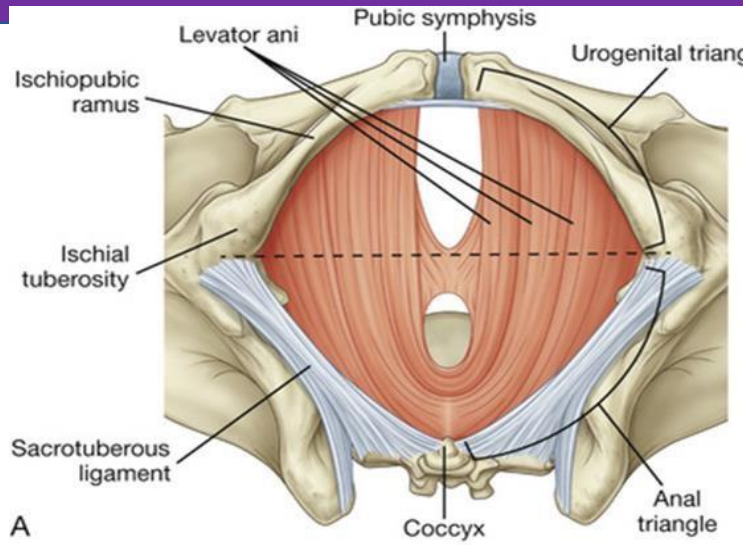

Pubic symphysis
Pubic tubercle
Obturator foramen
Anterior superior iliac spine
Ischiopubic ramus
Acetabulum
Sacrum
Ischial tuberosity
Sacrotuberous ligament
Margin of pelvic outlet
Coccyx

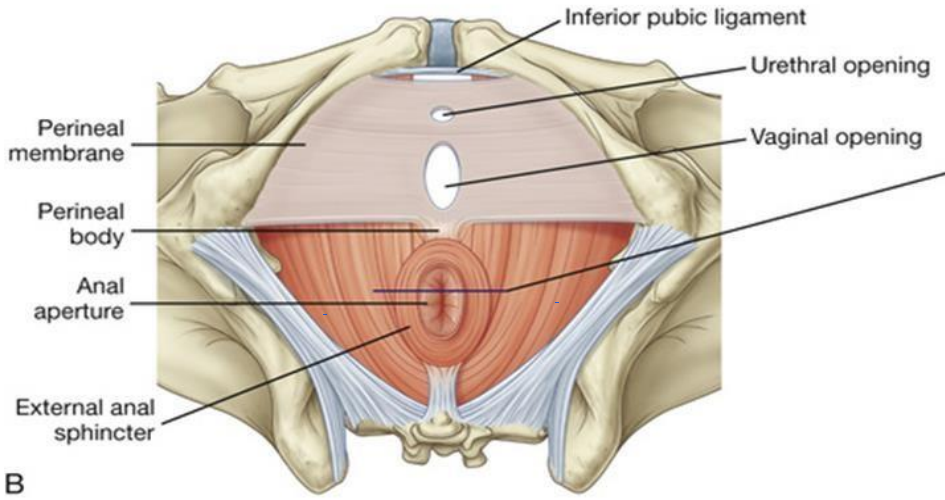
The Anal Triangle

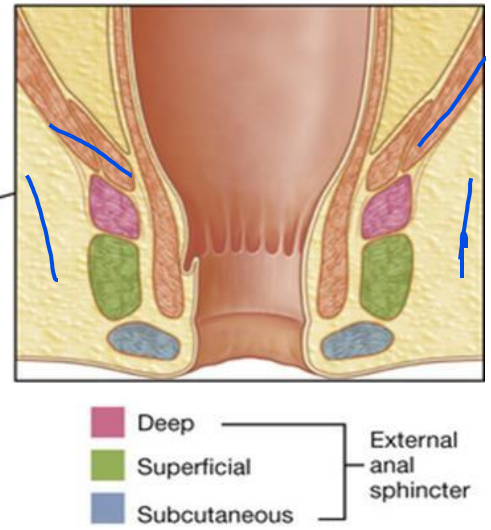
CONTENTS:

1. Anal canal
2. External anal sphincters
3. Ischio-rectal fossa

The ischio-anal fossae allow movement of the pelvic diaphragm and **expansion of the anal canal during defecation.**







THE ISCHIO-RECTAL (ANAL)FOSSA

Definition: Wedge shaped space (gutters) on each side of anal canal

Shape: conical in shape lies in both sides of the anal canal.

Function: it gives space of the anal canal to dilate during the process of defecation.

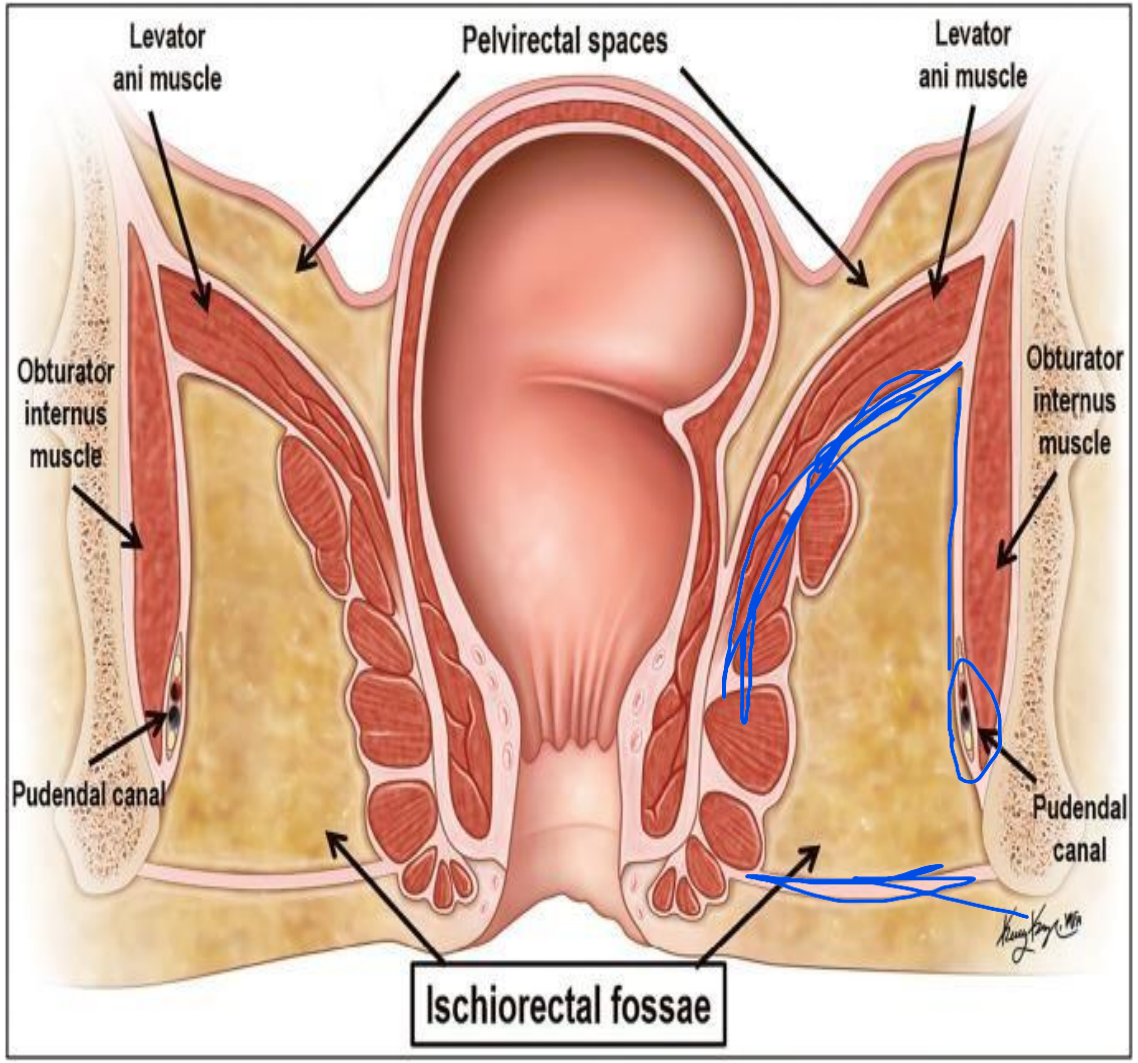
BOUNDARIES:

Apex: formed of origin of levator ani from obturator fascia.

Base: formed of skin and fascia.

Medial wall: consists of levator ani and external anal sphincter.

Lateral wall: consists of obturator internus and obturator fascia.



THE ISCHIO-RECTAL (ANAL)FOSSA

CONTENTS: SAQ

1. Pad of fat.
2. Inferior rectal vessels and nerves.
3. Pudendal canal containing:

a. Pudendal nerve.

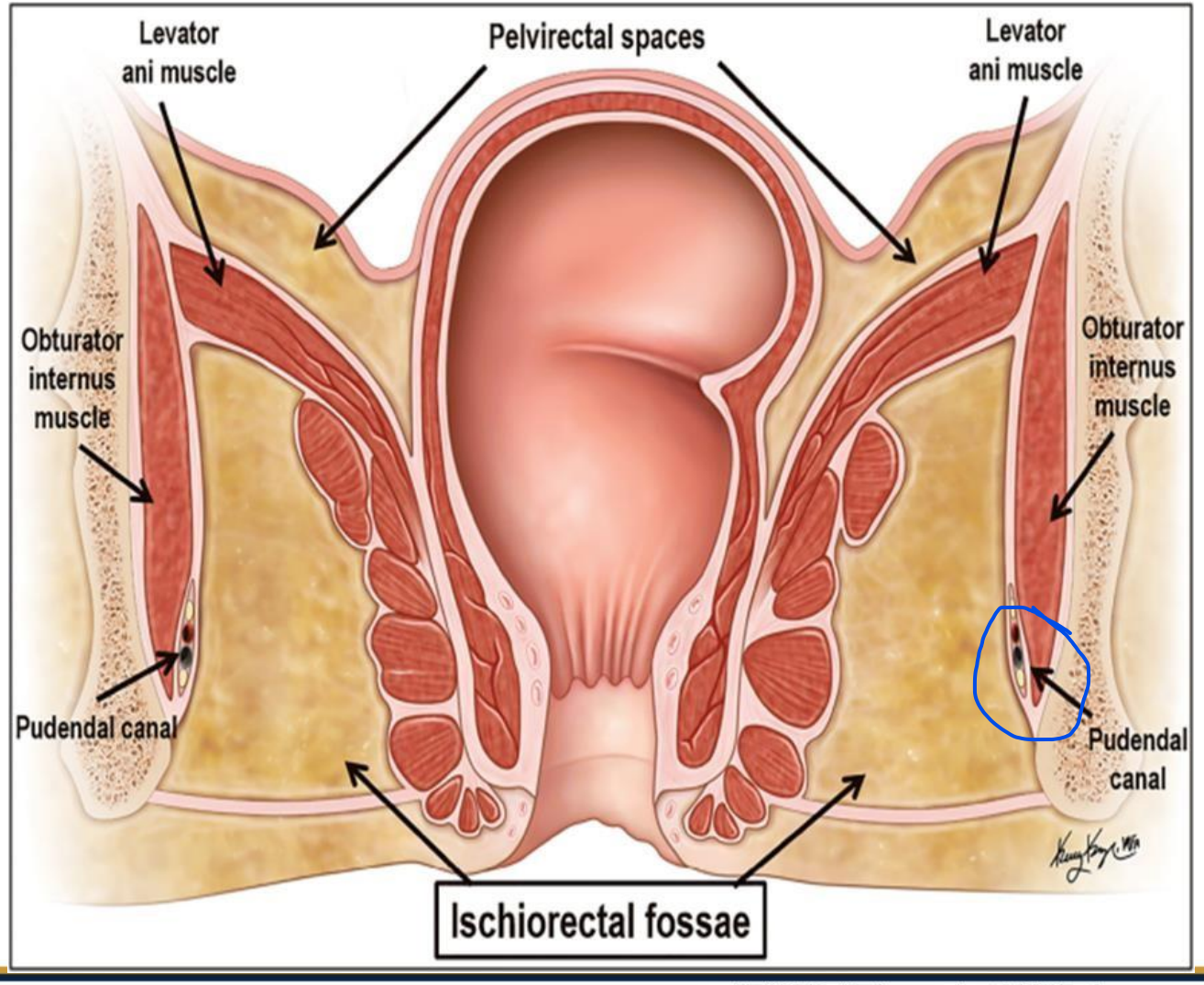
b. Internal pudendal vessels.

The pudendal (Alcock's) canal

Formed by splitting of obturator fascia and lies in lateral wall of ischiorectal fossa.

CONTENTS:

1. Pudendal nerve
2. Internal pudendal vessels.



Development and Descent of Gonads (Male and Female)

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

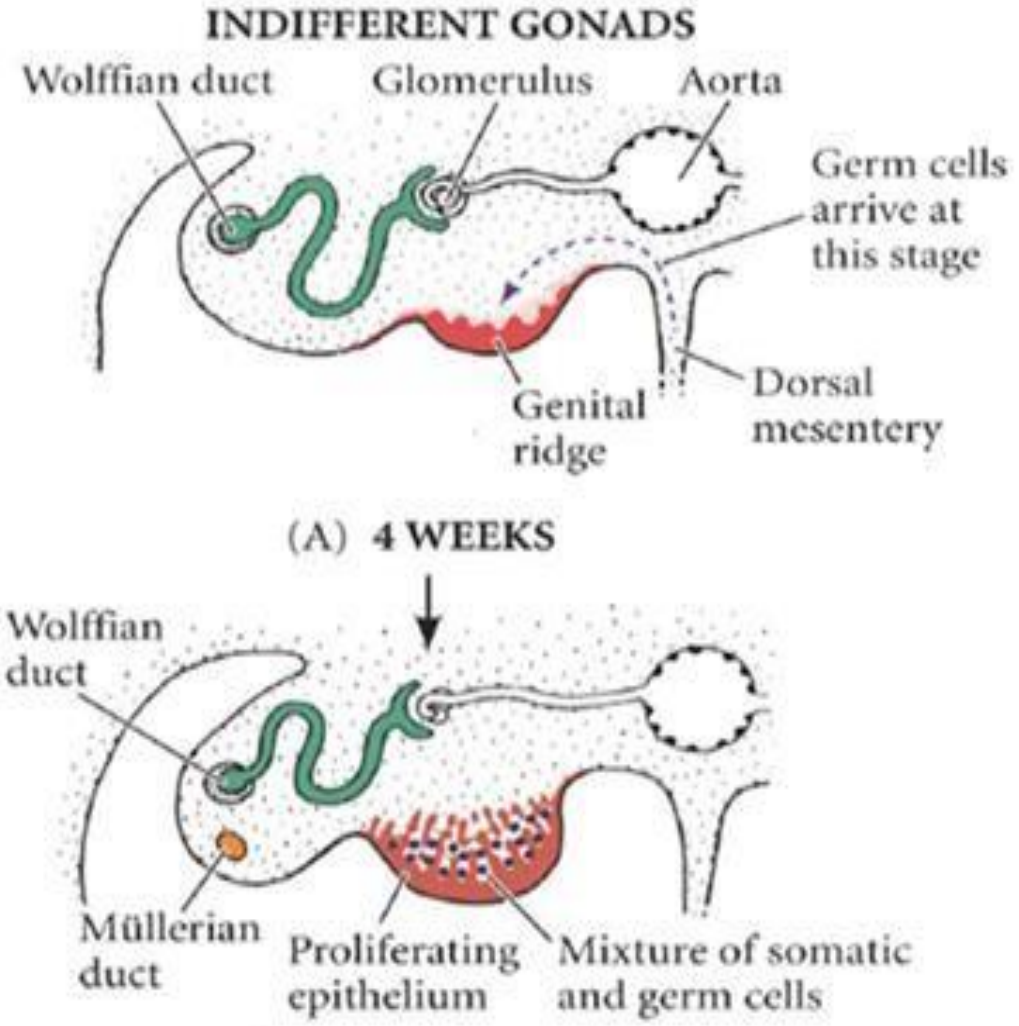
- The Genotype of The Embryo (46,XX or 46,XY) is established at fertilization.
- During weeks 1–6, the embryo remains in a sexually undifferentiated stage. This means that genetically female embryos and genetically male embryos are phenotypically indistinguishable.
- During week 7, the indifferent embryo begins phenotypic sexual differentiation.
- By week 12, female or male characteristics of the external genitalia can be recognized.
- By week 20, phenotypic differentiation is complete.
- As the indifferent gonad develops into the testes, Leydig cells and Sertoli cells differentiate to produce testosterone and Müllerian-inhibiting factor (MIF),respectively.
- In the presence of TDF, testosterone, and MIF, the indifferent embryo will be directed to THE MALE PHENOTYPE.
- In the absence of TDF, testosterone, and MIF, the indifferent embryo will be directed to the female phenotype.

1.Phenotypic sexual differentiation occurs in a sequence beginning with the gonads, then the genital ducts, and finally the primordia of external genitalia.

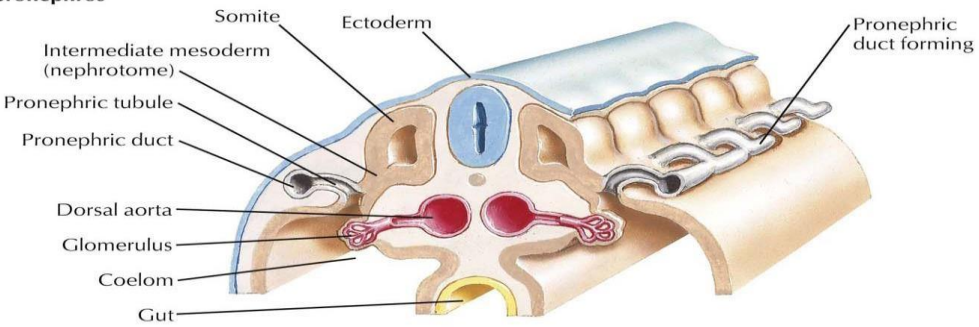
2- Chromosomal sex of an embryo is determined at fertilization by the kind of sperm (X or Y) that fertilizes the oocyte.

- A longitudinal elevation of mesoderm the UROGENITAL RIDGE forms on each side of the dorsal aorta .
- The part of the urogenital ridge giving rise to the urinary system is the nephrogenic cord .

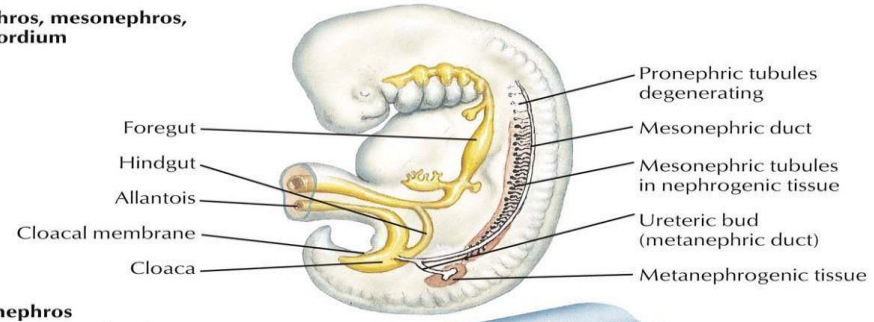
The part giving rise to the genital system is the GONADAL RIDGE.



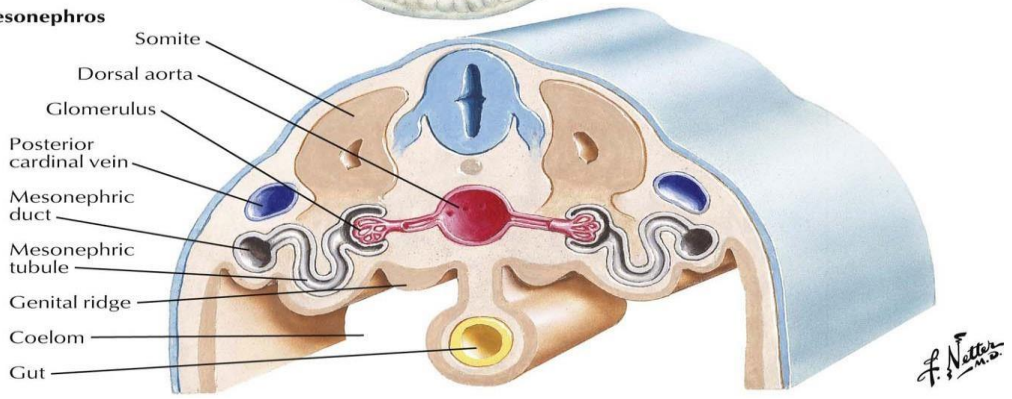
Section through pronephros

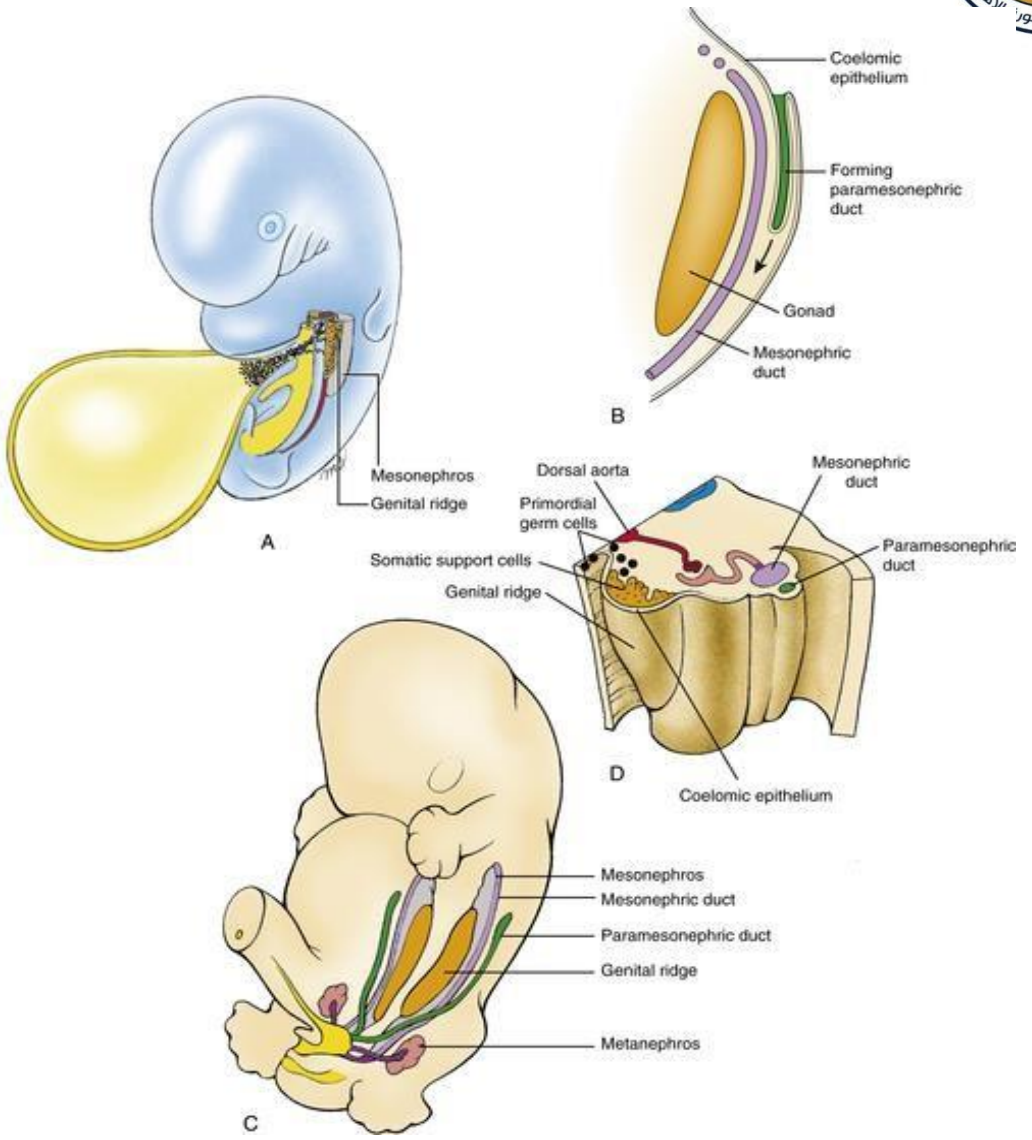


Topography of pronephros, mesonephros, and metanephric primordium



Section through mesonephros





Chromosomal Basis of Sex Determination:

1 Chromosomal sex depends on whether an X-bearing sperm or a Y-bearing sperm fertilizes the X-bearing oocyte.

3Development of the male phenotype (characteristics of an individual) requires a Y chromosome.

4The SRY gene (sex-determining region on the Y) for a testis-determining factor (TDF) has been localized in the short arm region of the Y chromosome.

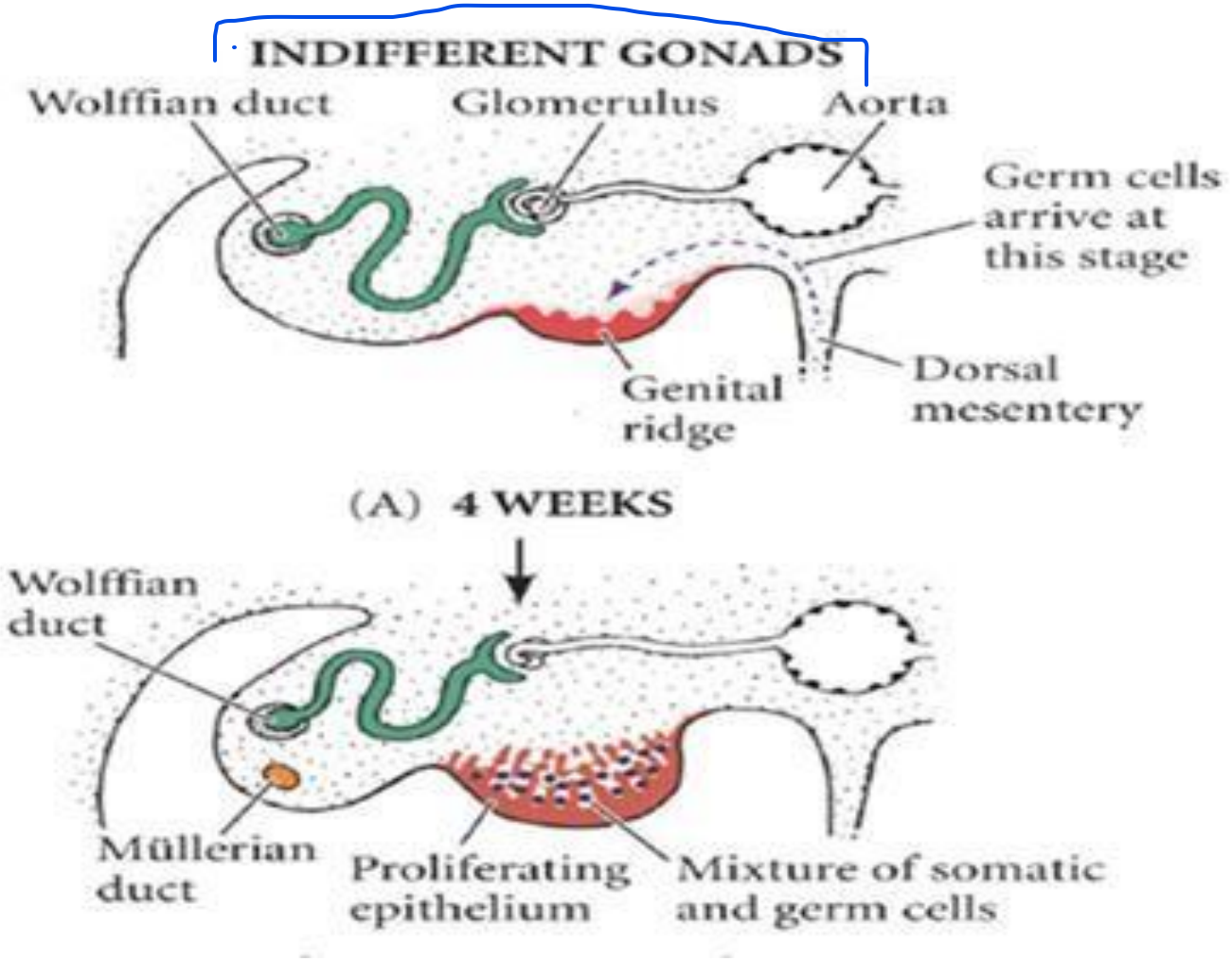
5Under the influence of this organizing factor, the gonadal cords differentiate into seminiferous cords (primordia of seminiferous tubules).

6 The absence of a Y chromosome results in the formation of an ovary.

I. Development of the gonads

- **Time:** 4th week.
- **Origin:** the gonads (the testis and ovaries) develop from **three sources:**

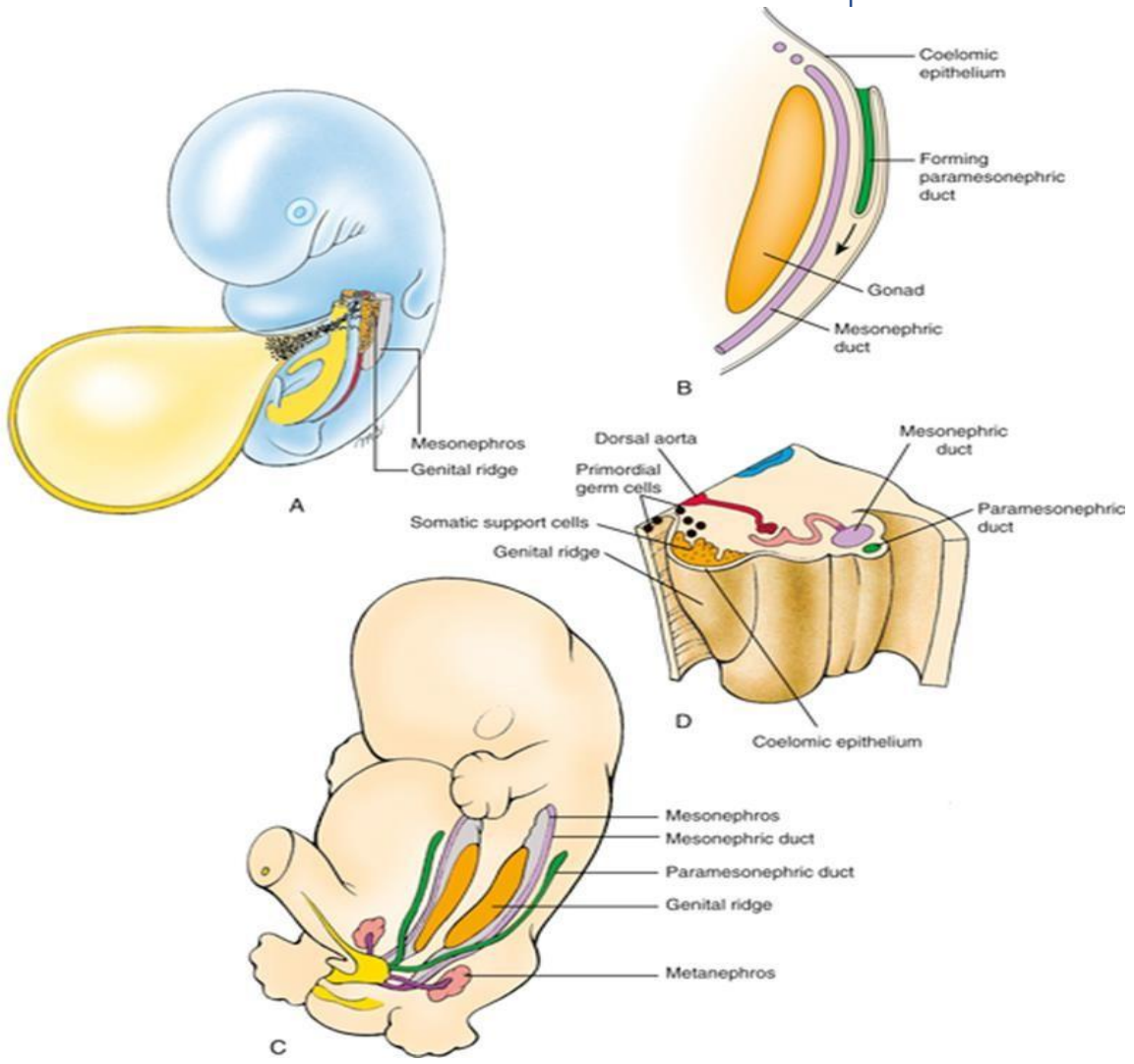
1. **The Mesothelium** lining the posterior abdominal wall.
2. The underlying **mesoderm.**
3. The **primordial germ** cells.



The Stages of the Development of the Gonads:

I. The Indifferent Stage:

- there is no difference in both sexes.
- A longitudinal ridge called THE GENITAL RIDGE appears on the posterior abdominal wall, on each side of the midline between The Mesonephros and The Dorsal Mesentery.
- In The 6th Week, the primitive sex cells (endodermal cells of the yolk sac near the origin of the allantois) migrate along the dorsal mesentery of the hindgut and invade the GENITAL RIDGE.
- These primitive germ cells have an inductive influence on the development of the gonad into ovary or testis.



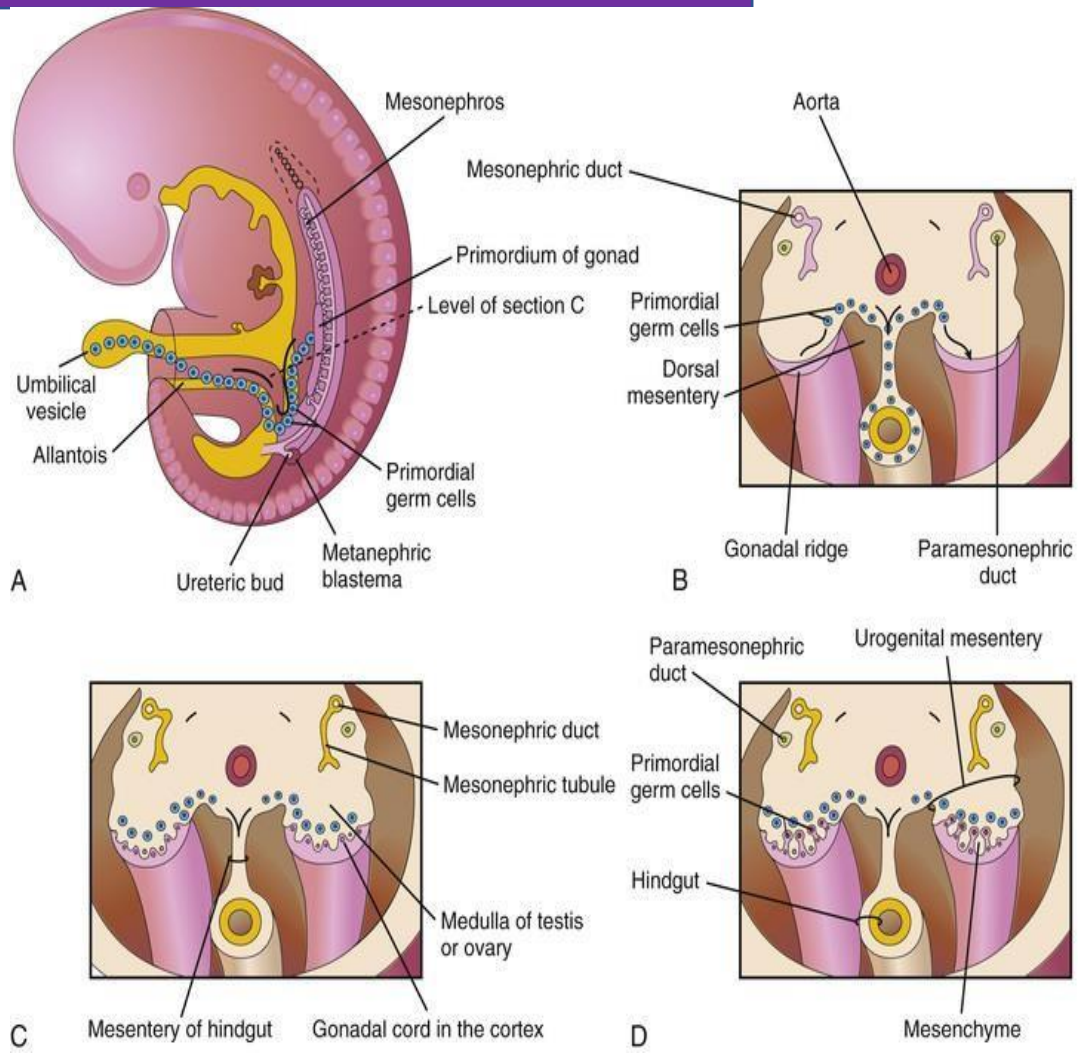
The Stages Of The Development Of The Gonads:

- The epithelial cells (under the inductive effect of the germ cells), invade the underlying mesoderm.
- They form a number of irregular cords (the primitive sex cords) which gradually surround the invading primitive germ cells.
- These sex cords are connected to the surface epithelium.

❑ The indifferent gonad consists of an outer cortex and an inner medulla.

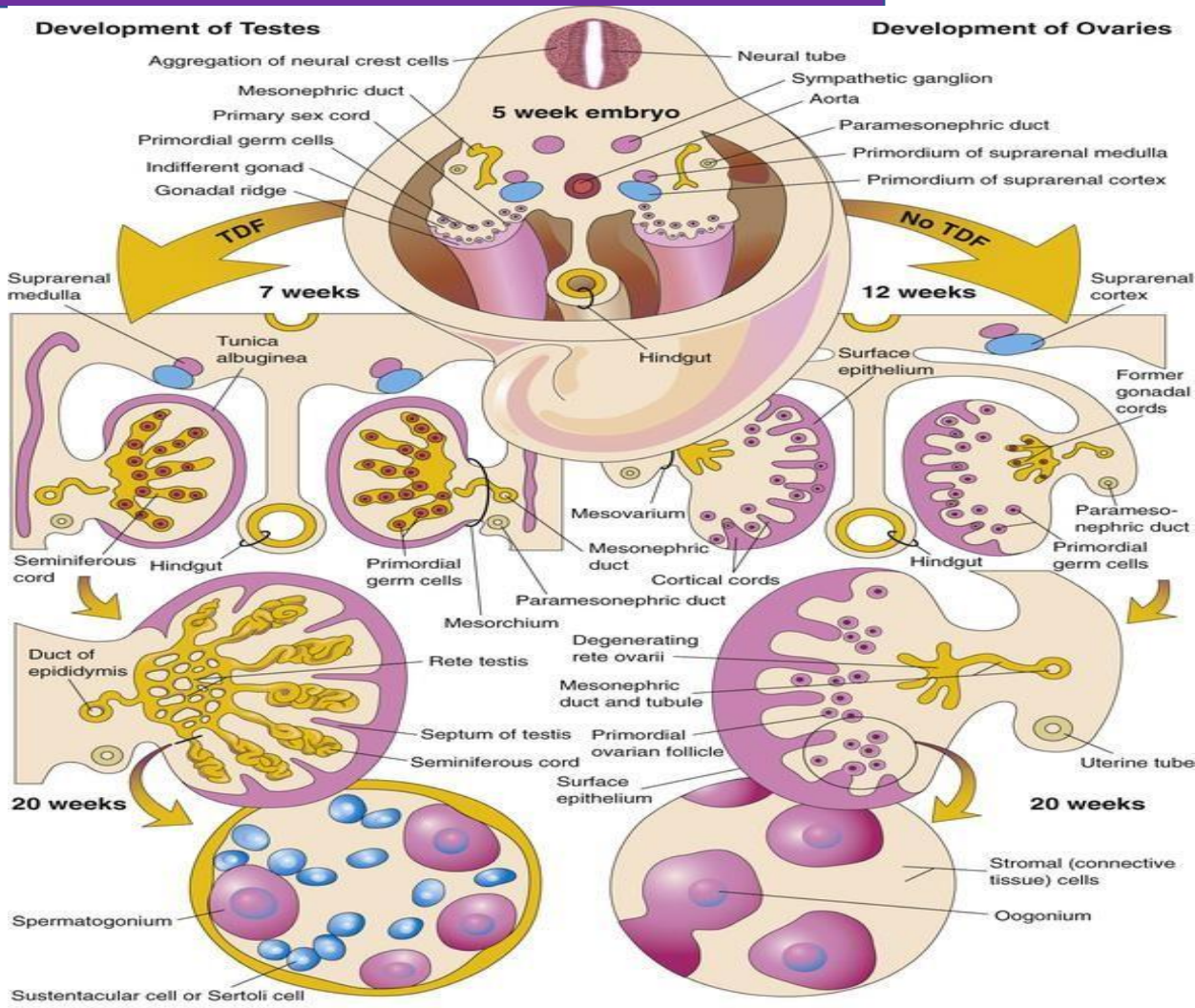
• IN FEMALE: the cortex differentiates into an ovary and the medulla regresses.

• IN MALE: the medulla differentiates into a testis and the cortex regresses.



A. Development Of The Male Gonad (Testis):

- **The primitive sex cords continue to proliferate and form a series of anastomosing cords (the testis cords).**
- **By The end of the 7th Week, the testis cords lose contact with the surface epithelium and are separated from it by a dense fibrous capsule (tunica albuginea).**



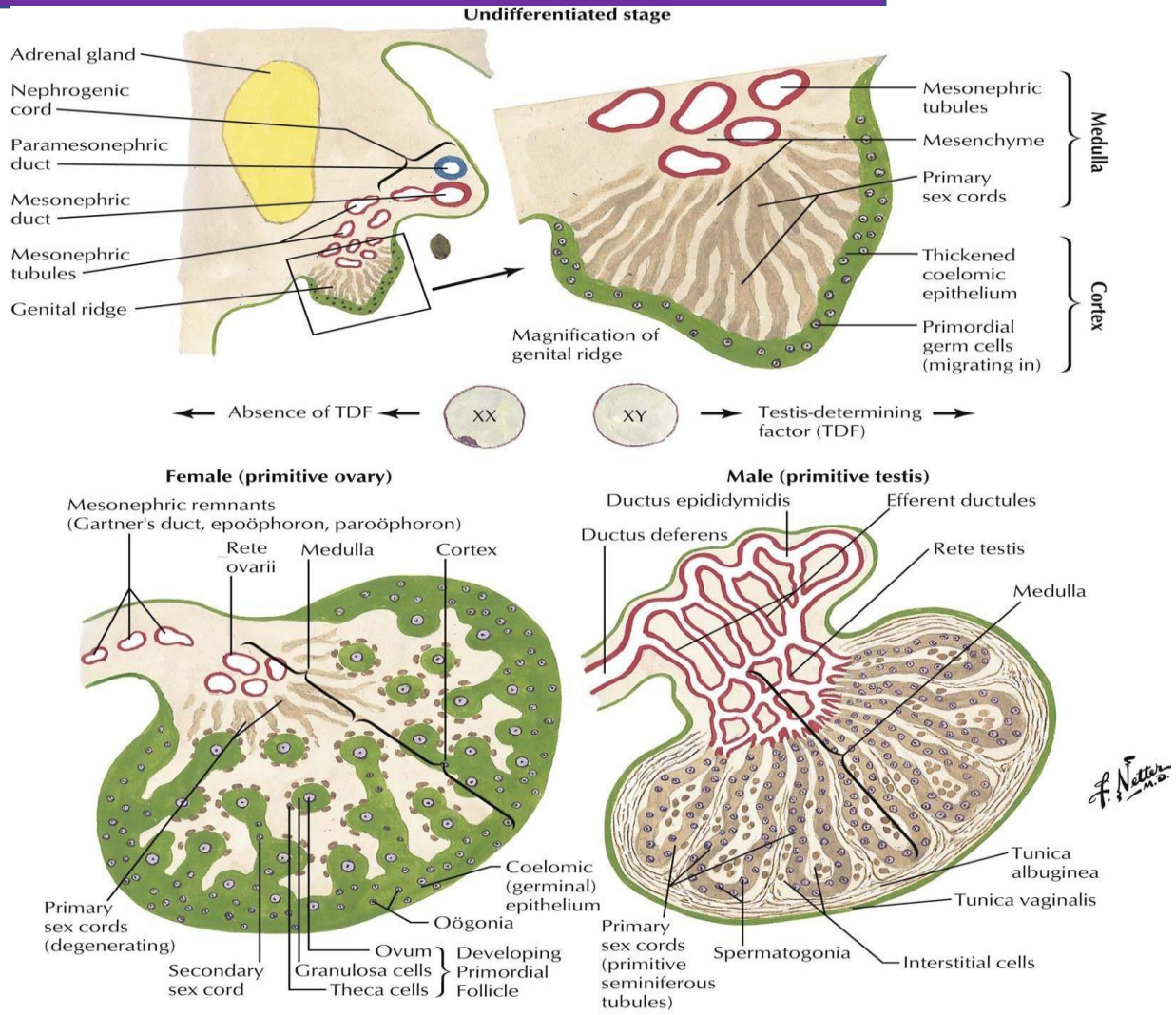
A. Development of the male gonad (testis):

❖ **During the 4th month, the testis cords elongate and become horseshoe shape and then differentiates into three types of tubules:**

- **The seminiferous tubules: Its wall is lined by 2 Types of Cells:**

1. SERTOLI CELTS: supporting cells derived from the epithelium of the testis.

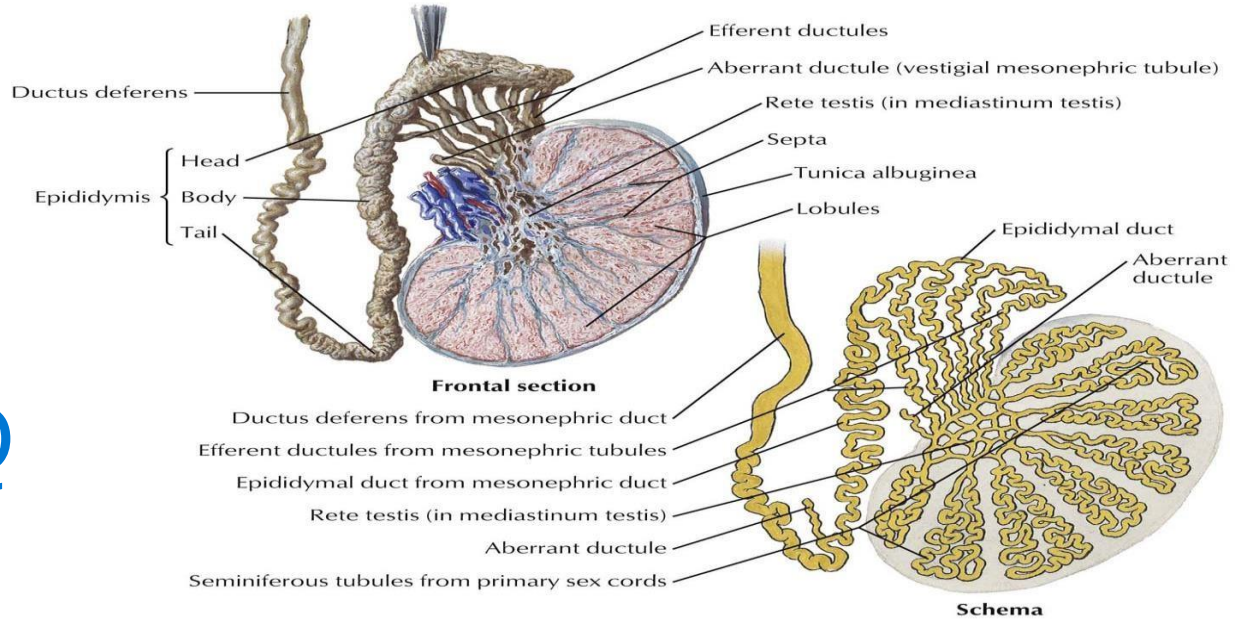
2. SPERMATOGONIA: derived from the primitive germ cells.

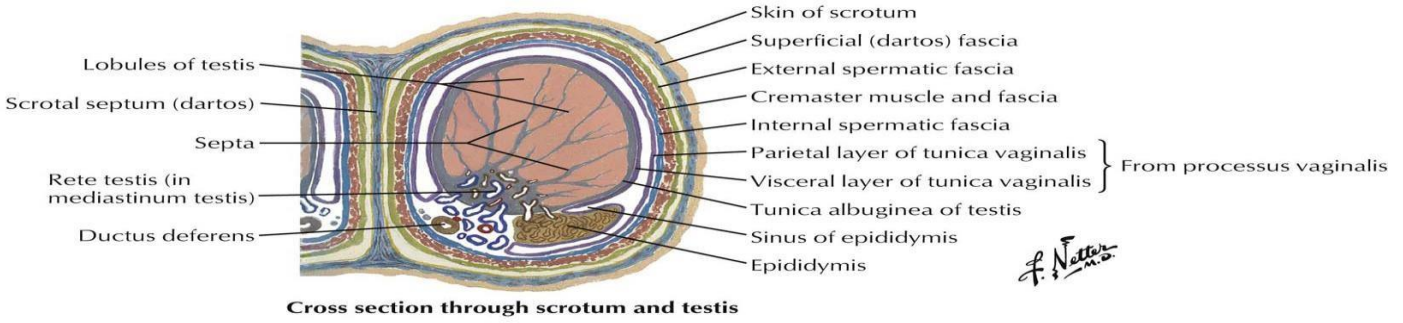


A. Development of the male gonad (testis):

- **THE TUBULI RECTI:** occupy the part close to the mediastinum testis.
- **The rete testis;** occupy the mediastinum testis.
- **The Interstitial Cells Of Leydig:** develop from the mesoderm between the seminiferous tubules.

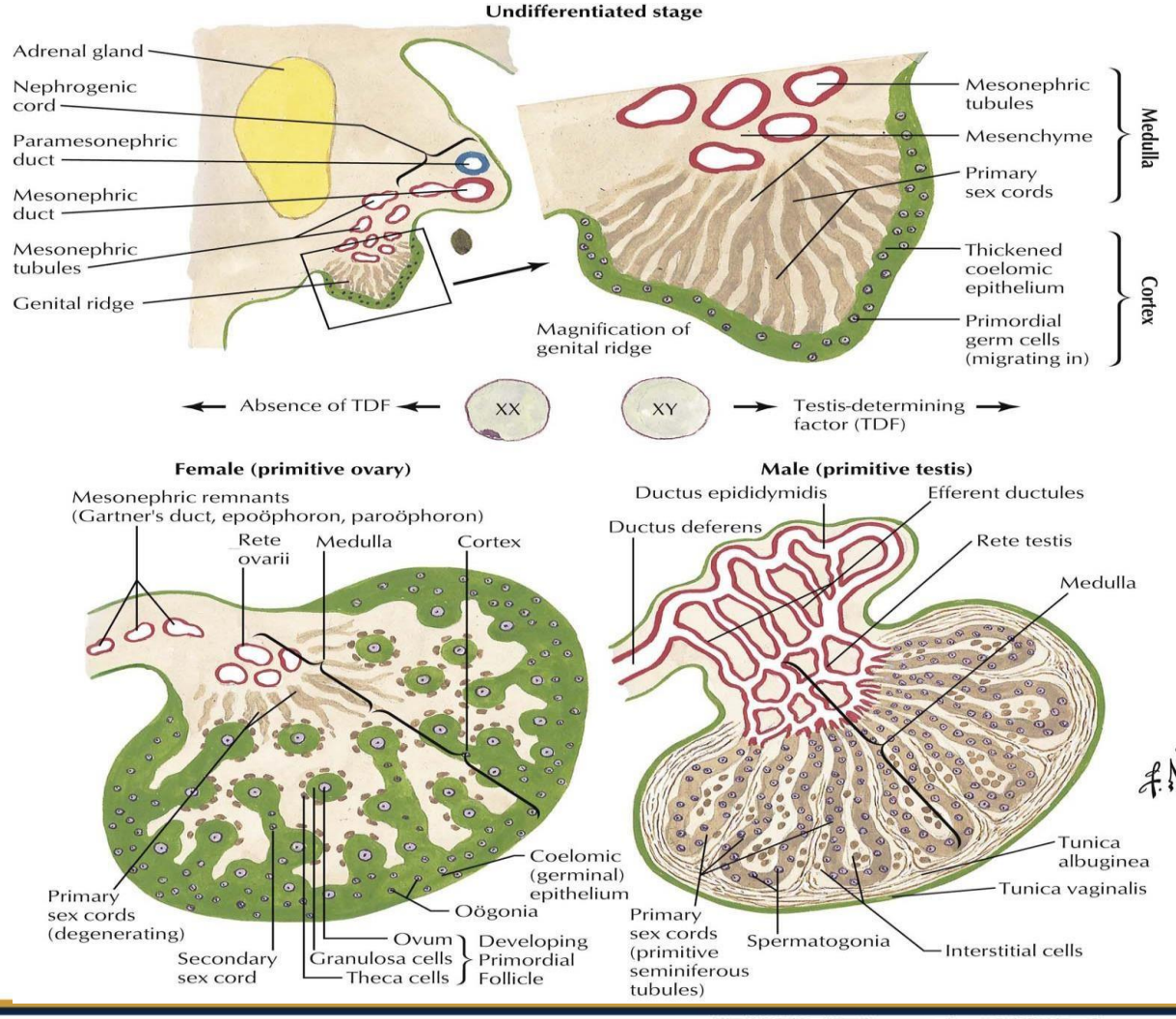
MCQ





B. Development of the female gonad (ovary):

- **THE PRIMARY SEX CORDS** degenerate.
- **SECONDARY SEX CORDS** are formed and extend from the epithelium into the underlying mesoderm.
- **THE SECONDARY SEX CORDS** increase in size and the primitive germ cells are incorporated into them, forming primary follicles.
- **Active Mitosis Of Oogonia** occurs during fetal life producing thousands **OF PRIMARY FOLLICLES.**

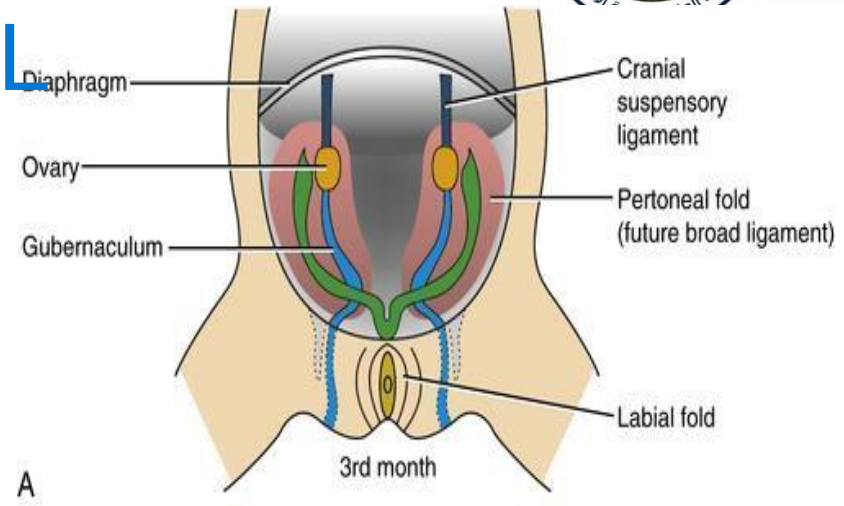


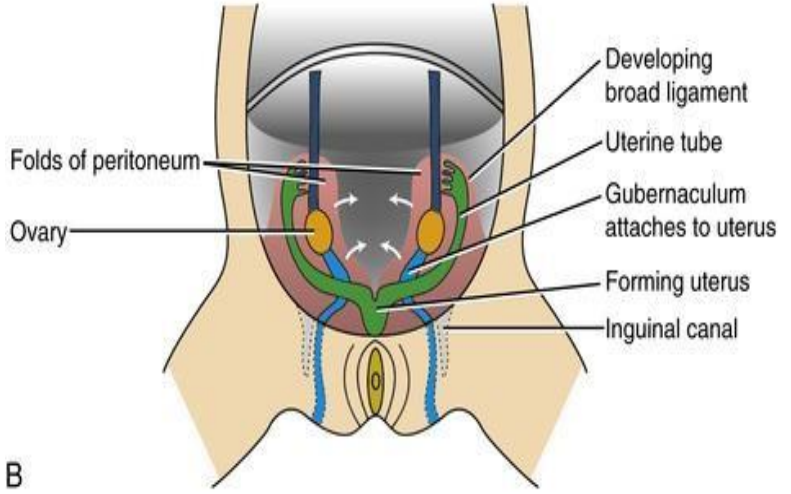
Ovarian Descent: INTERNAL

- The ovaries also descend from the lumbar region of the posterior abdominal wall and relocate to the lateral wall of the pelvis; however, they do not pass from the pelvis and enter the inguinal canals.

MCQ

- The gubernaculum is attached to the uterus near the attachment of the uterine tube.
- The cranial part of the gubernaculum becomes the ovarian ligament, and the caudal part forms the round ligament of the uterus .
- The round ligaments pass through the inguinal canals and terminate in the labia majora.
- The relatively small processus vaginalis in the female usually obliterates and disappears long before birth.
- A persistent processus in a female fetus is known as a vaginal process of peritoneum or a canal of Nuck.





Descent of the testis

INTERNAL & EXTERNAL

DEFINITION: The process of migration of the testis from its original position (high lumbar region) to reach the genital swelling (scrotum).

Factors Help In Descent Of The Testis:

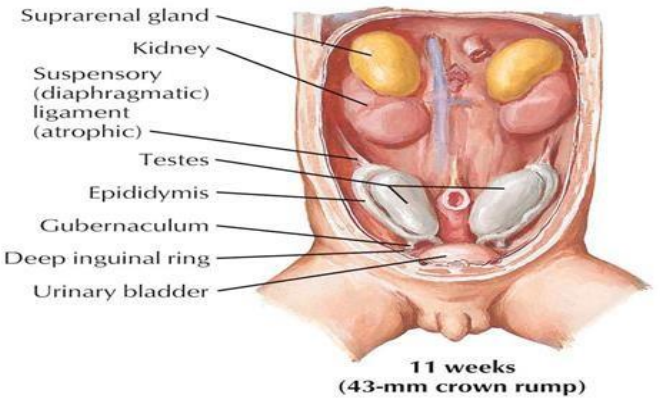
SAQ

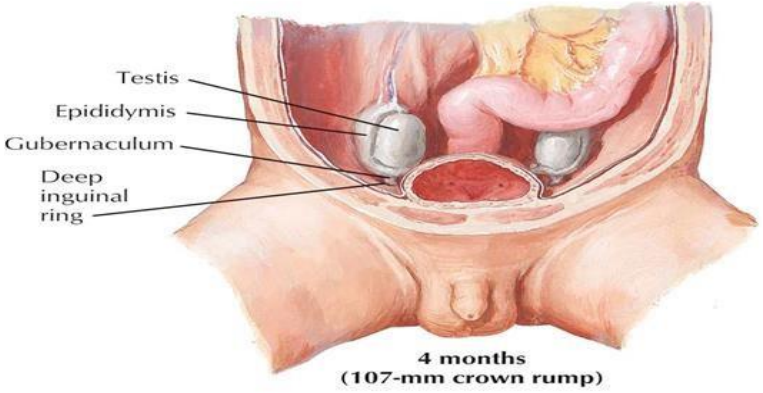
A. MAIN FACTORS:

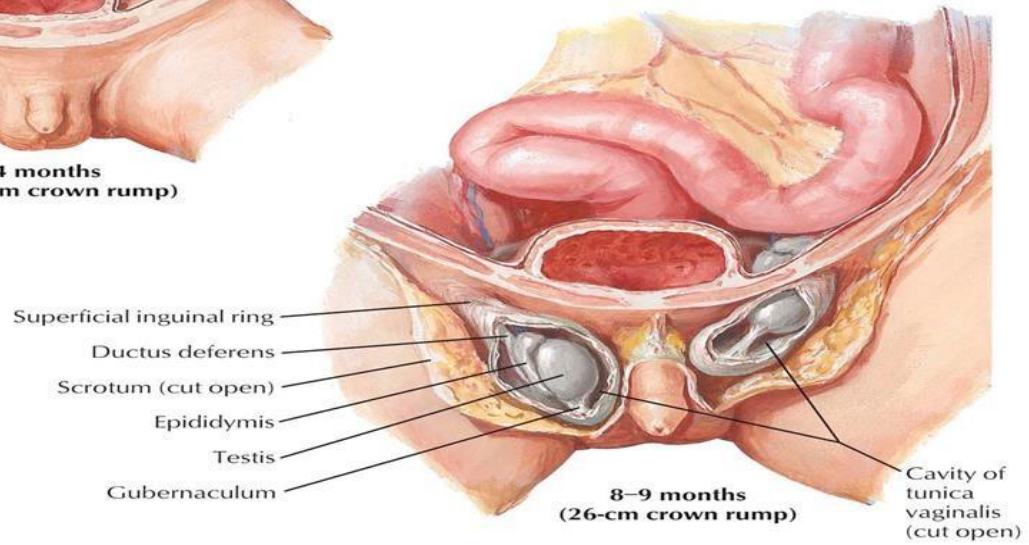
1. **Gubernaculum Ligaments:**

is a fibromuscular band connecting the testis to the scrotum.

2. **Processus Vaginalis:** is a diverticulum from the peritoneum in front of gubernaculum.



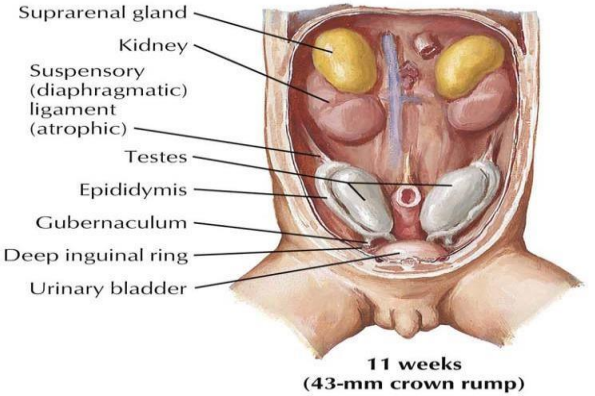


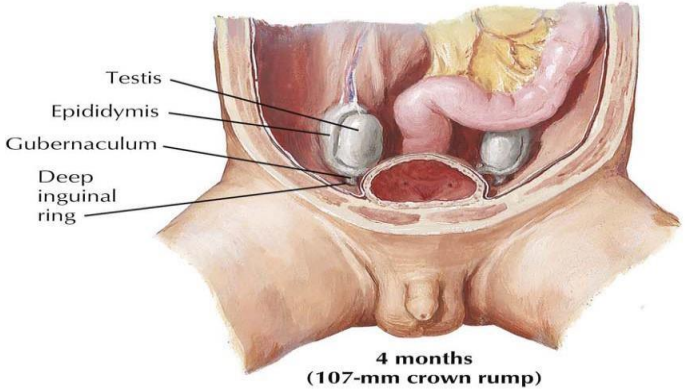


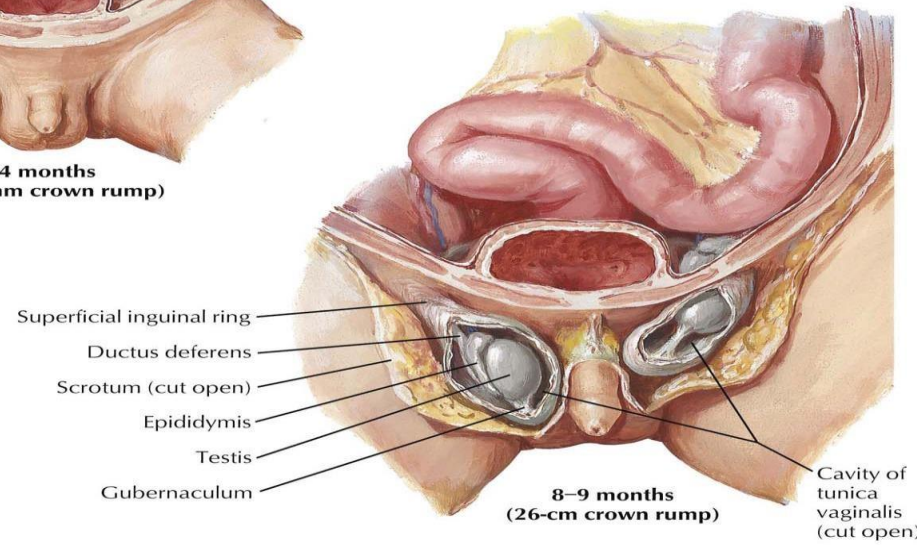
Descent of the testis

3. Male Sex Hormone (Testosterone) And Gonadotrophin Hormone:

- testosterone stimulate the muscles of gubernaculum to contract.
- It reaches a peak during the 2nd month. This explains why testis does not descent before 2nd month.







Descent of the testis

B. SUBSIDIARY FACTORS:

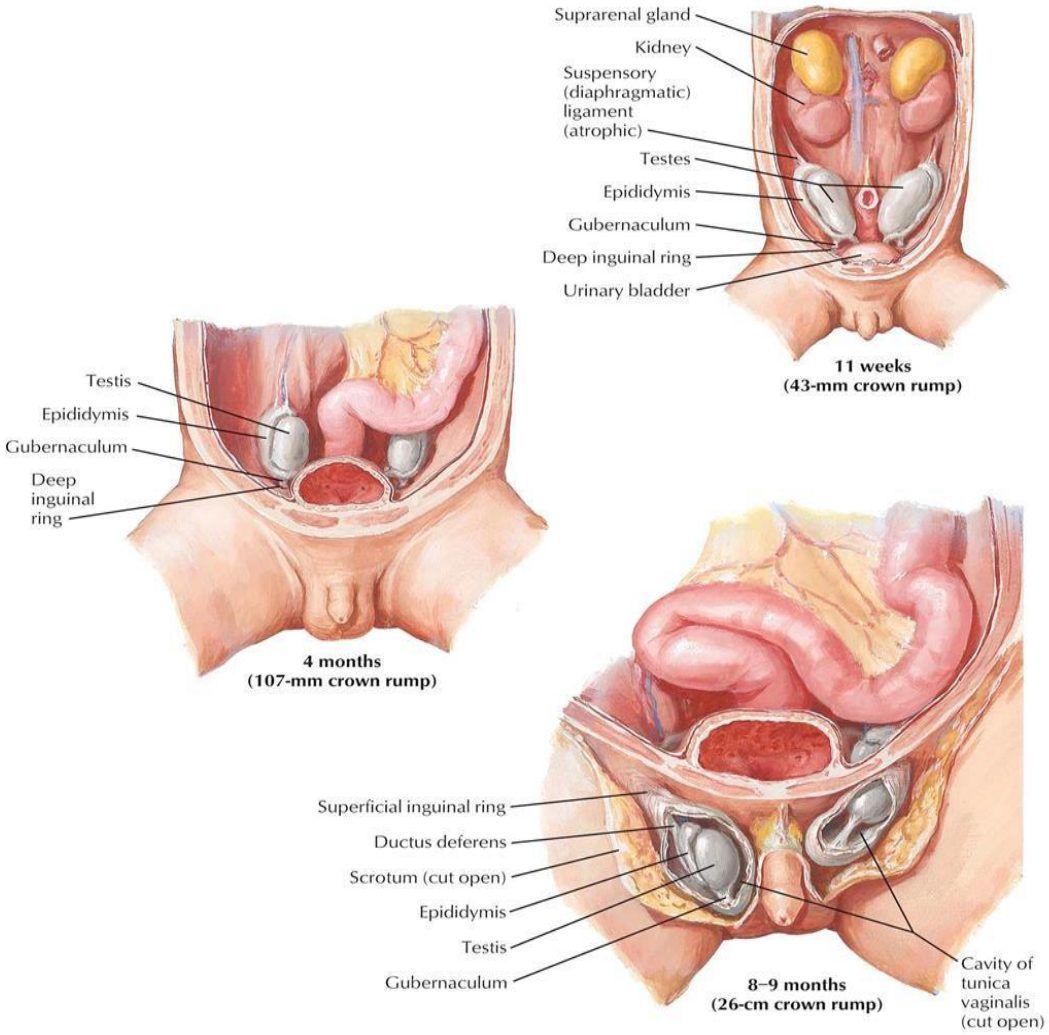
1. **Increase intra-abdominal pressure** due to:

A. Increase size of liver and viscera.

B. Reduction of the physiological umbilical hernia.

2. **Enlargement of the testis and atrophy of mesonephric kidney:** allow caudal descent.

3. **Atrophy of the paramesonephric duct** enables the testis to move trans-abdominally to the deep inguinal ring.



Descent of the testis

PROCESS OF THE DESCENT OF THE TESTIS:

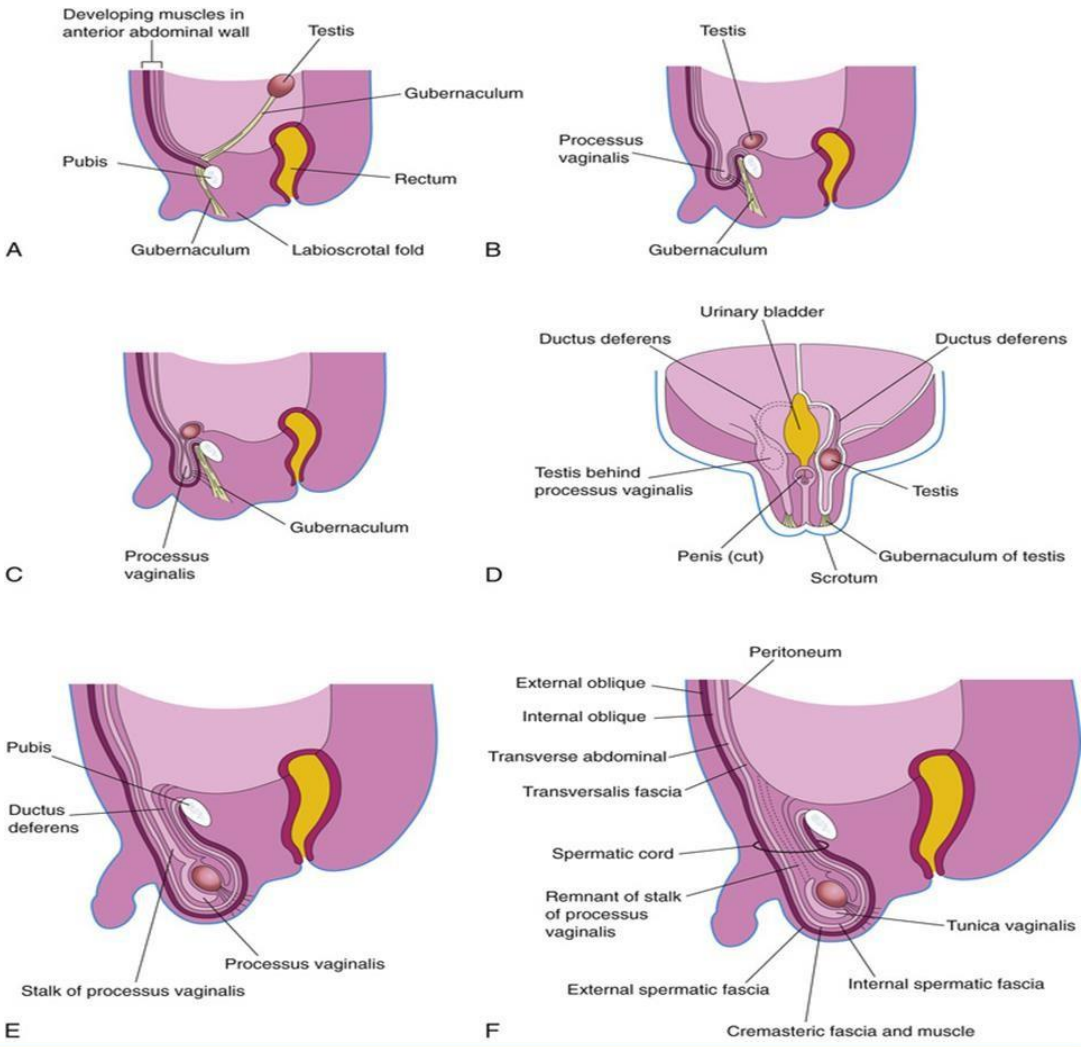
A. INTERNAL DESCENT:

- The descent of the testis from its high position to the deep inguinal ring.
- THE GUBERNACULUM contract under the effect of the testosterone and pull the

testis downward to reach the iliac fossa then the deep inguinal ring.

B. EXTERNAL DESCENT:

- The descent of the testis from the deep inguinal ring to the scrotum.
- The testis traverses the inguinal canal at the 7th month, reaches the superficial inguinal ring at the 8th month and reaches the scrotum at the 9th month.



Descent of the testis

RESULT OF DESCENT OF TESTIS:

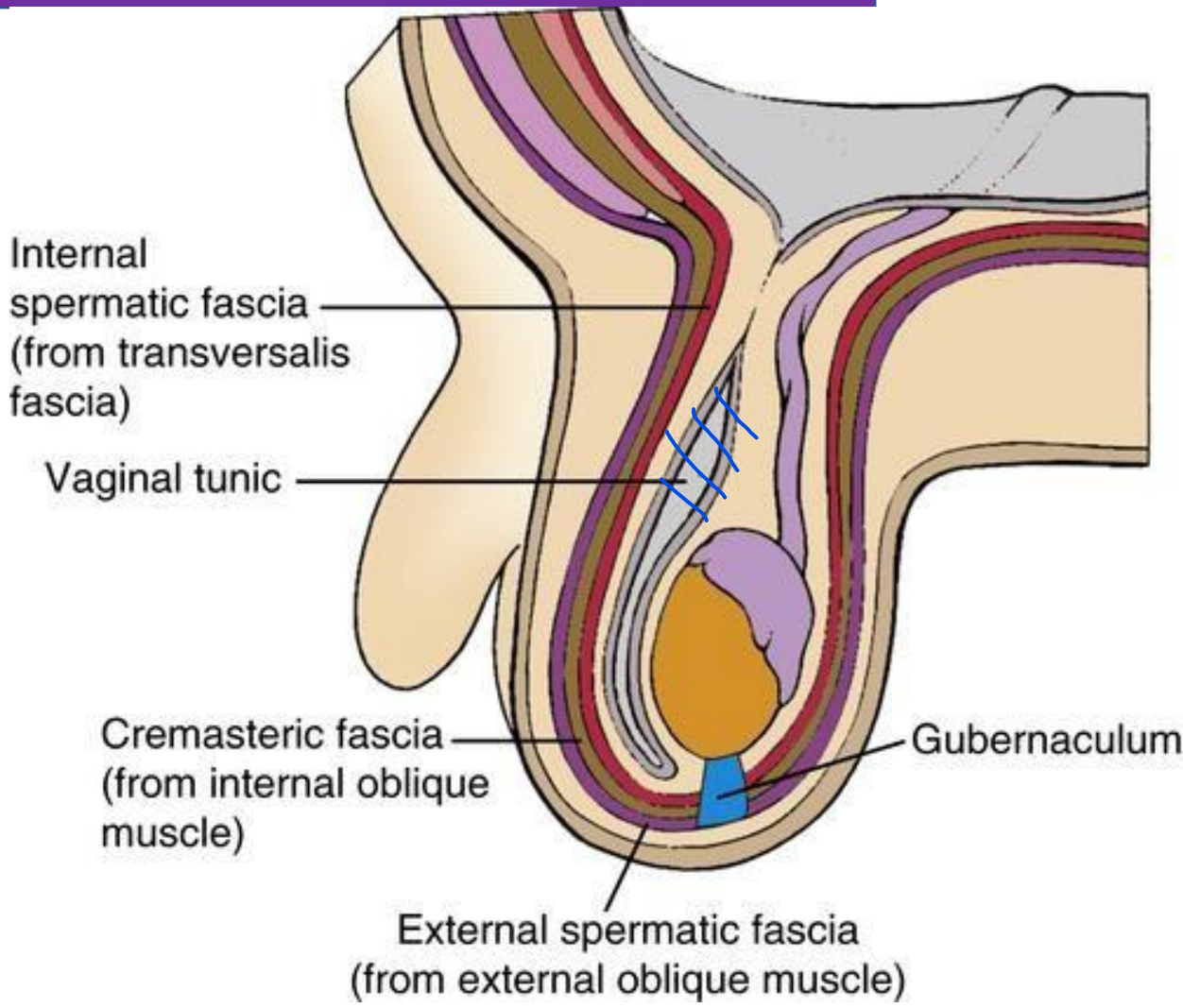
A. As a result of the passage of the testis through the anterior abdominal wall it takes 3 covering:

- **The external spermatic fascia: from the external oblique muscle.**
- **Cremasteric muscle \and fascia: from the internal oblique muscle.**
- **The internal spermatic fascia; from the fascia transversals.**

B. AS A RESULT OF THE DESCENT OF TESTIS, it pulls the blood supply and lymphatic drainage.

This explains:

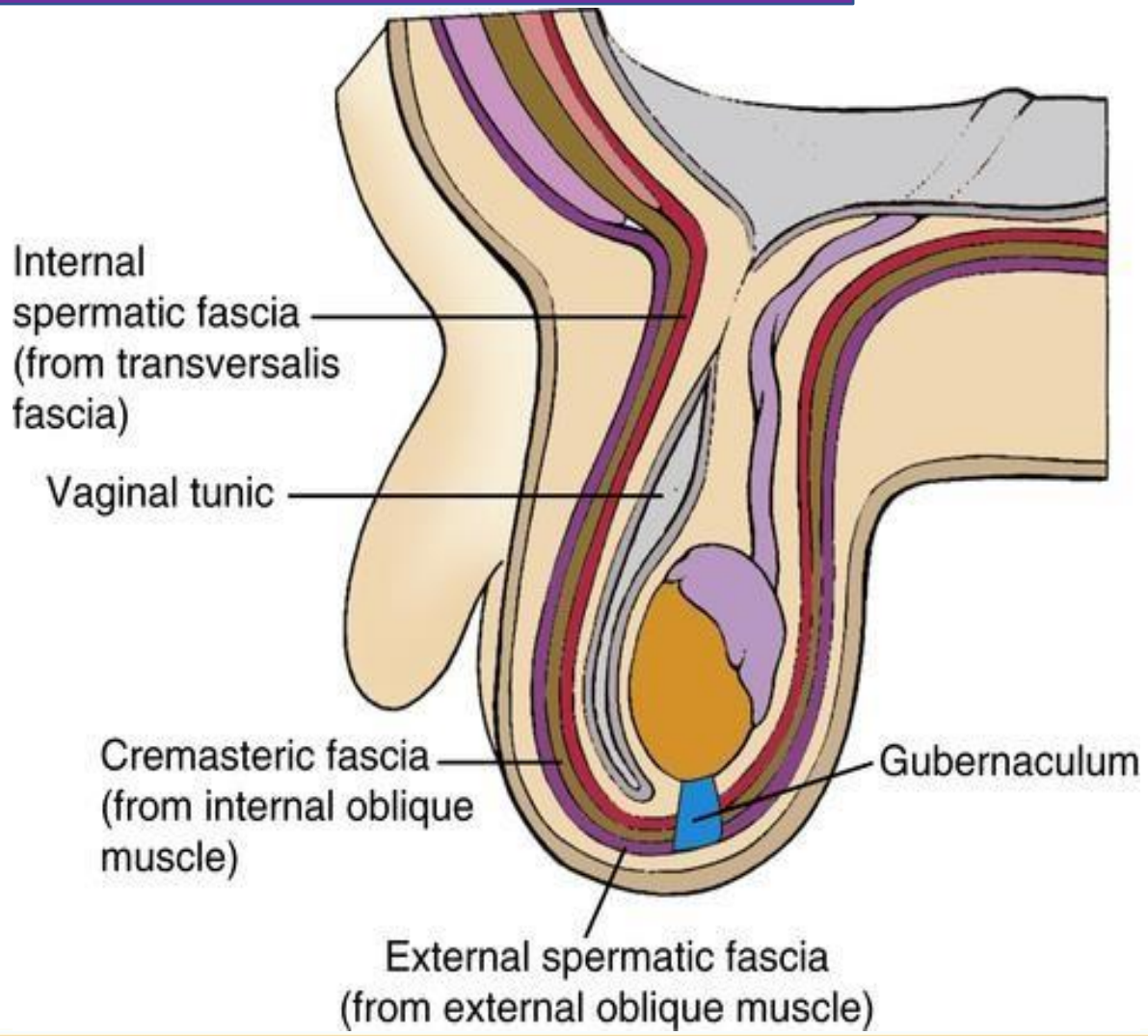
- **The origin of testicular artery from abdominal aorta.**
- **Lymphatic drainage of testis into the para-aortic lymph node.**



Descent of the testis

- **Fate Of Gubernaculum and Processus Vaginalis:** SAQ
- **GUBERNACULUM: degenerates and is replaced by fibrous tissue at the bottom of the scrotum.**
- **PROCESSUS VAGINALIS:**
- **lose its connection with the peritoneal cavity and forms the visceral layer and parietal layers of tunica vaginalis.**

N.B. the gubernaculum in female forms the ligament of the ovary and the round ligament of the uterus.



ANOMALIES OF THE TESTIS

1. ABSENCE OF THE TESTIS:

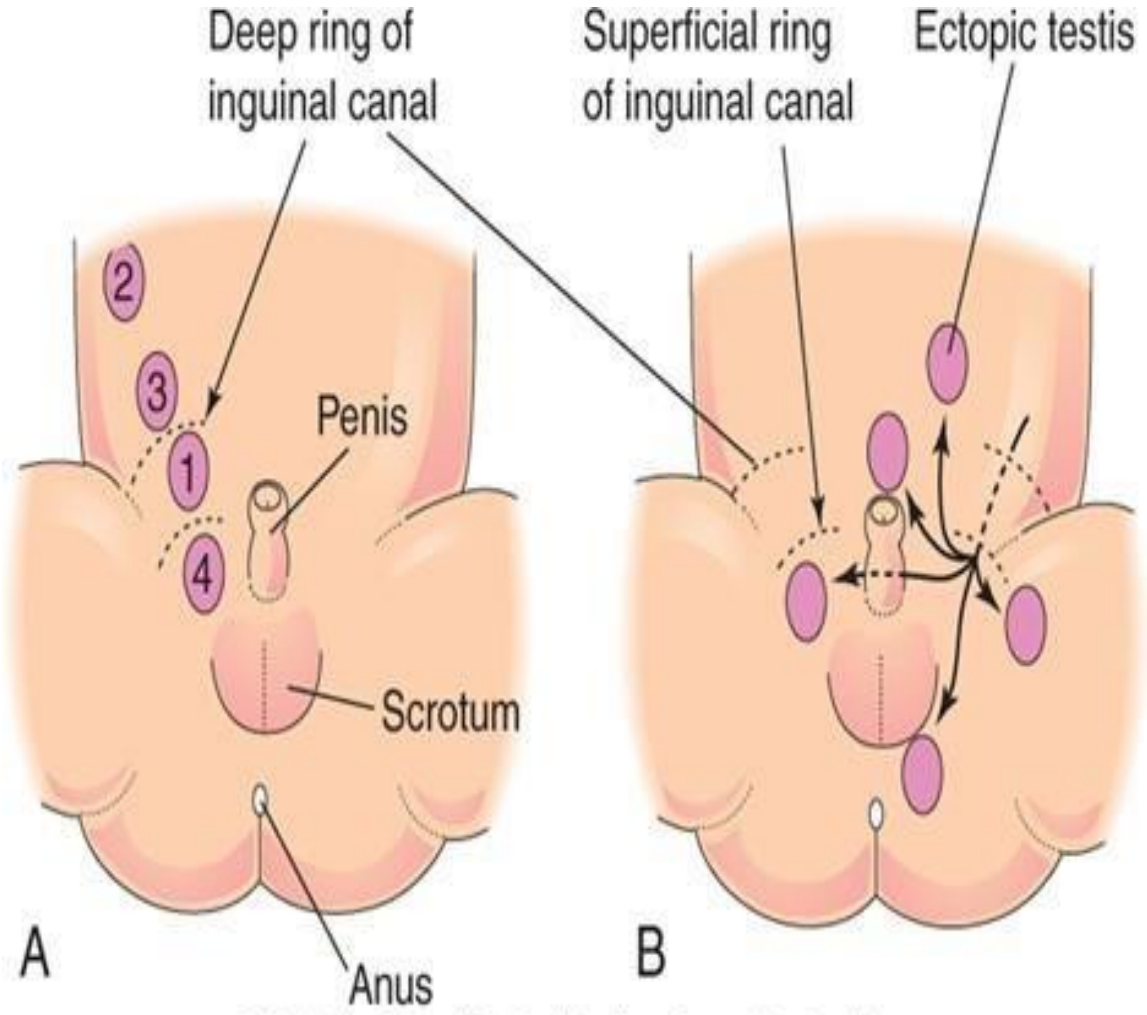
- **Cause**: Failure of formation or migration of the primordial germ cells.
- **Features:** absent one or both testes.

2. ANOMALIES OF DESCENT:

A. UNDESCENDED TESTIS (CRYPTORCHISM):

- **Cause**: Improper development of **GUBERNACULUM**.
- **Features:** The testis fails to reach the scrotum. The testis may remain at the following sites:

- On the **posterior abdominal wall.**
- In the iliac fossa.
- **Within the inguinal canal.**
- At the superficial inguinal ring.



CRYPTORCHIDISM:

- Cryptorchidism (hidden testes) is the most common anomaly in neonates and occurs in about 30% of premature males and in 3% to 5% of full-term males.
- Cryptorchidism may be unilateral or bilateral.
- If both testes remain within or just outside the abdominal cavity, they fail to mature, and sterility is common.
- If uncorrected, these men have a significantly higher risk of developing germ cell tumors, especially in cases of abdominal cryptorchidism.
- Undescended testes are often histologically normal at birth, but failure of development and atrophy are detectable by the end of the first year.
- Cryptorchid testes may be in the abdominal cavity or anywhere along the usual path of descent of the testis, but they are usually in the inguinal canal The cause of most cases of cryptorchidism is unknown, but a deficiency of androgen production by the fetal testes is an important factor.

ANOMALIES OF THE TESTIS

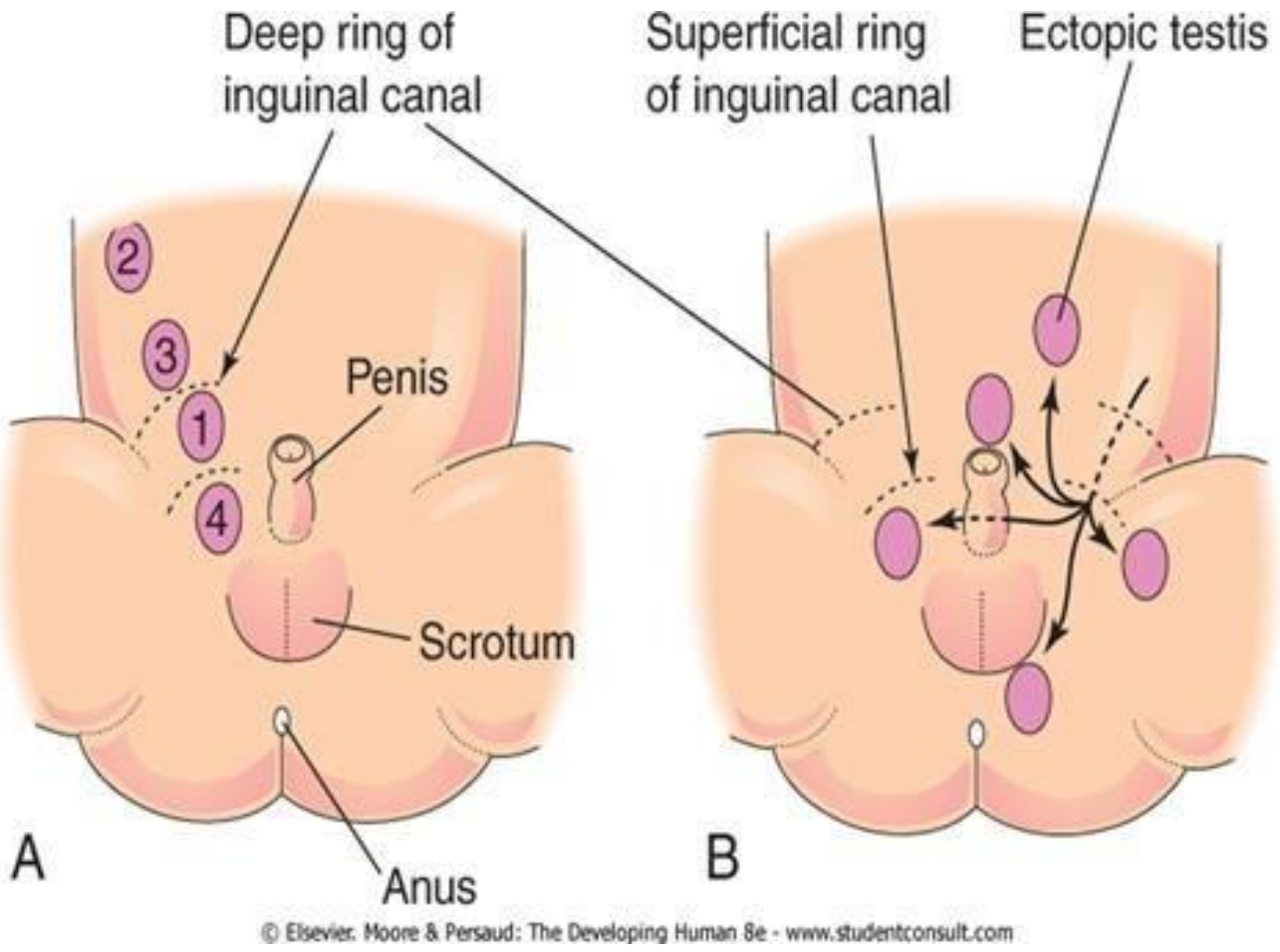
B. Maldescended Testis (Ectopic Testis):

- **Cause**: Abnormal attachment of the gubernaculum.
- **Features:** The testis present in abnormal locations:

• In the **medial side** of thigh.

• On **the dorsal surface** of the penis.

• On the **opposite side** of the scrotum.



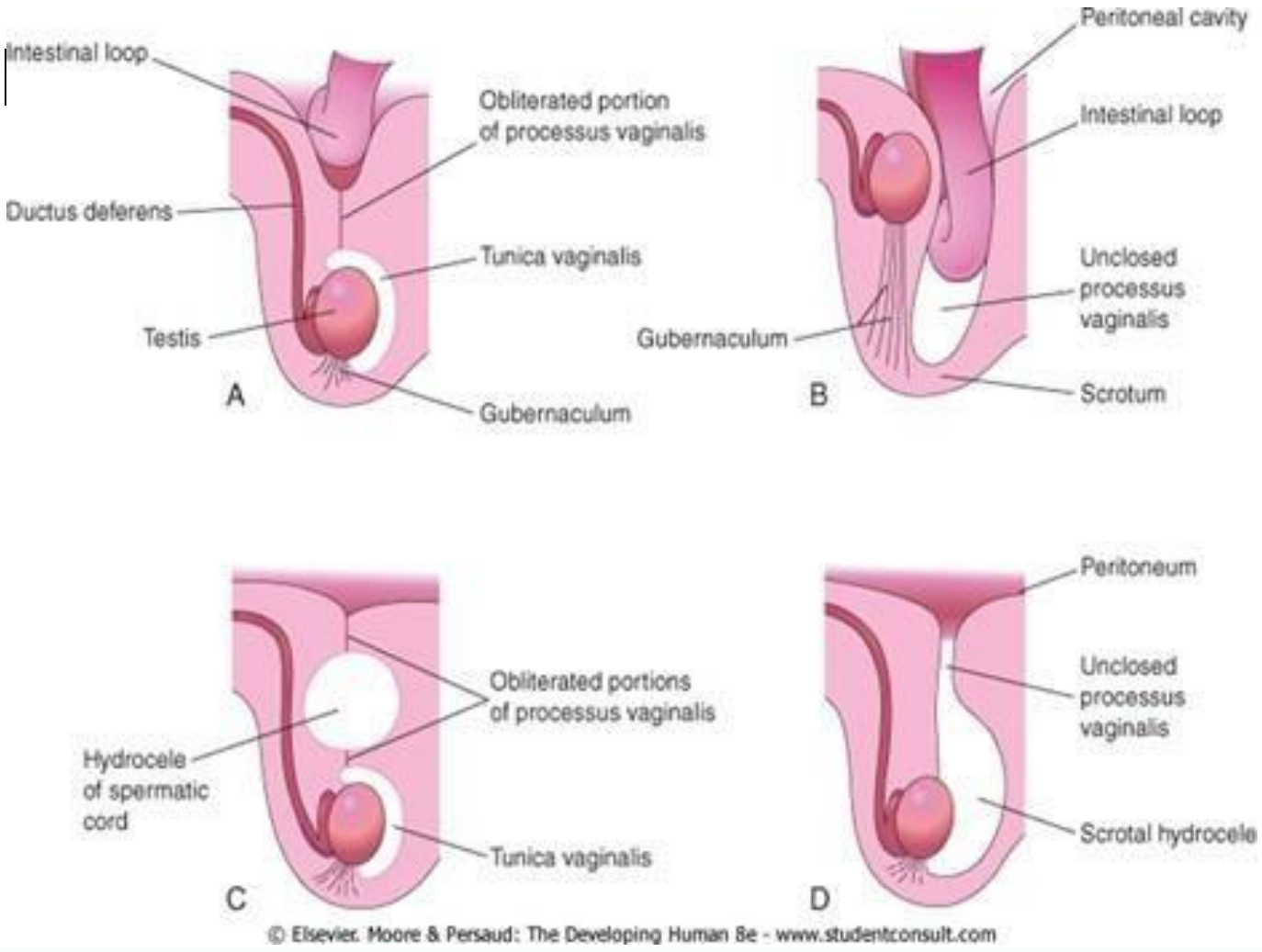
ANOMALIES OF THE TESTIS

3. Persistent Process Vaginal

- **Cause: the tunica vaginalis remains**

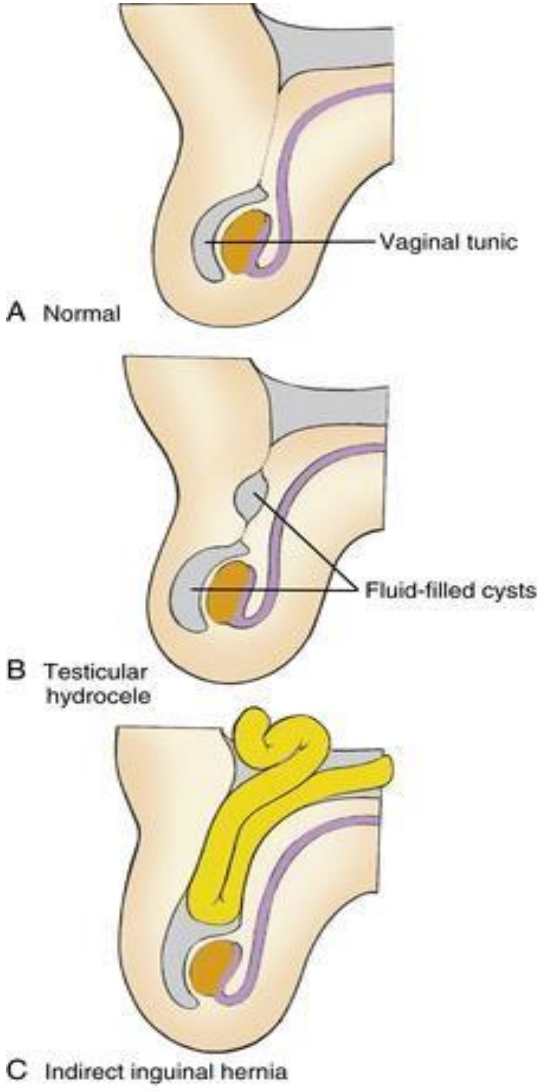
connected to the peritoneal cavity.

- **Features: Congenital inguinal hernia and/or congenital hydrocele.**



HYDROCELE:

- Occasionally the **abdominal end** of the processus vaginalis **remains open** but is too small to permit herniation of intestine .
- **Peritoneal fluid** passes into the patent processus vaginalis and forms **a scrotal hydrocele.**
- If the **middle part** of the processus vaginalis **remains open**, fluid may accumulate and give rise to **a hydrocele of the spermatic cord.**



Development of male and Female reproductive tract

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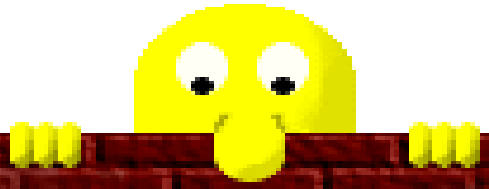
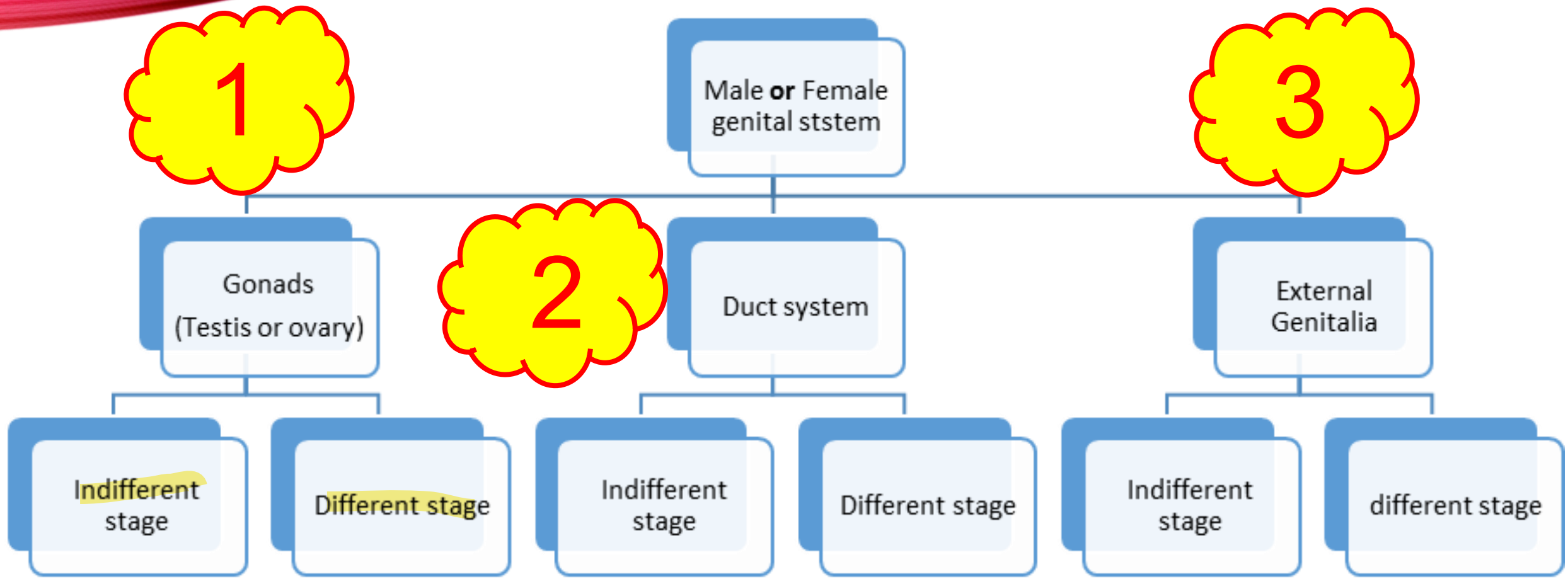
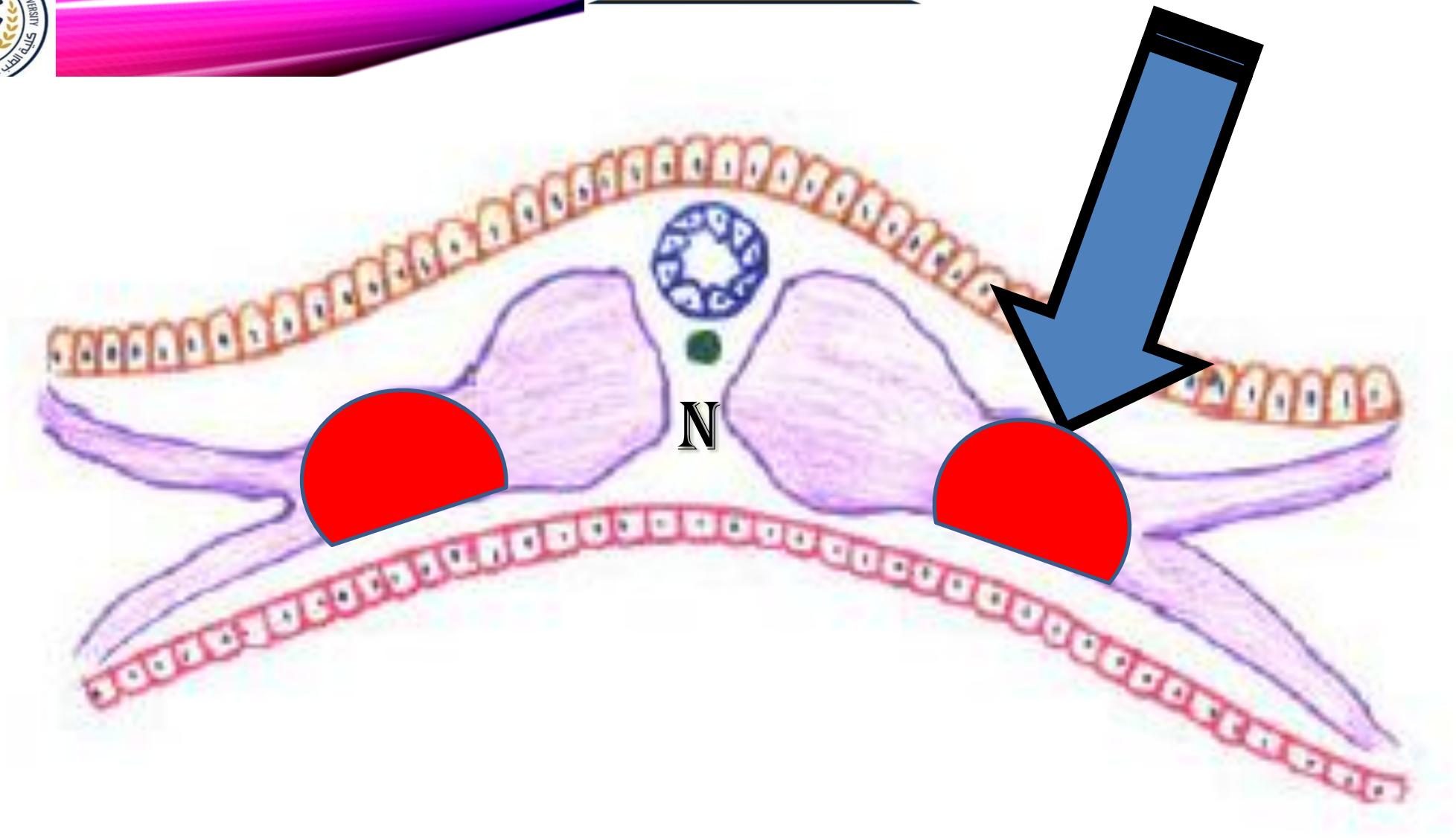
By
Dr. Fekry Shata



1. Development of reproductive tract


1
2
3
Male or Female genital ststem
Gonads (Testis or ovary)
Duct system
External Genitalia
Indifferent stage
Different stage
Indifferent stage
Different stage
Indifferent stage
different stage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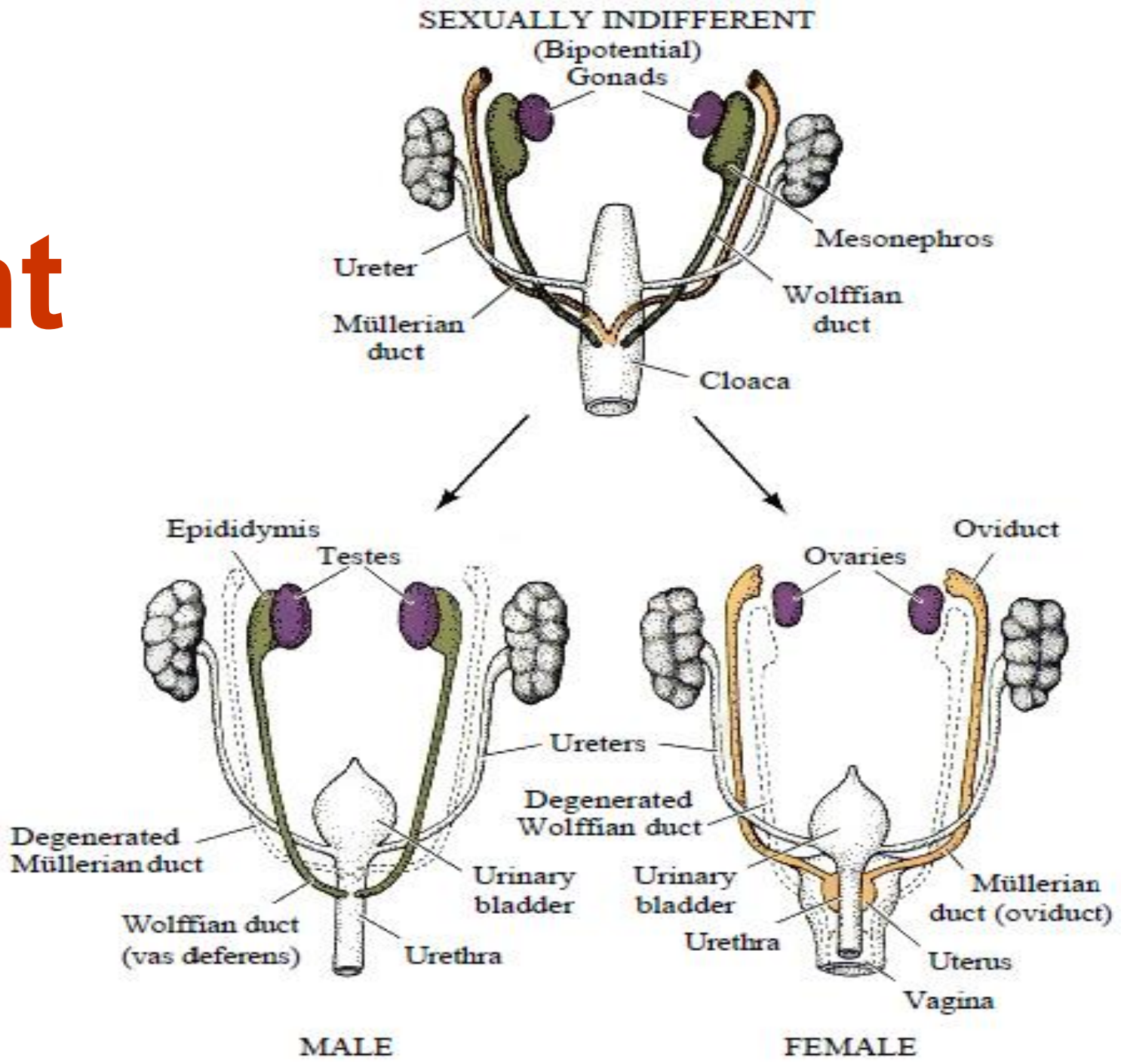
Development of genital ducts



Indifferent Stage

- In the first weeks of urogenital development, all embryos have two pairs of ducts, both ending at the **cloaca**. These are the:

A. The mesonephric (Wolffian) ducts: MCQ

Play an important part in the development of the **male** reproductive system.

MCQ

B. The paramesonephric (mullerian) ducts:

Have a leading role in the development of the **female** reproductive system.

I. Development of Male genital duct (fate of mesonephric tubules and duct)

- These develop from the mesonephric tubules and the mesonephric duct.

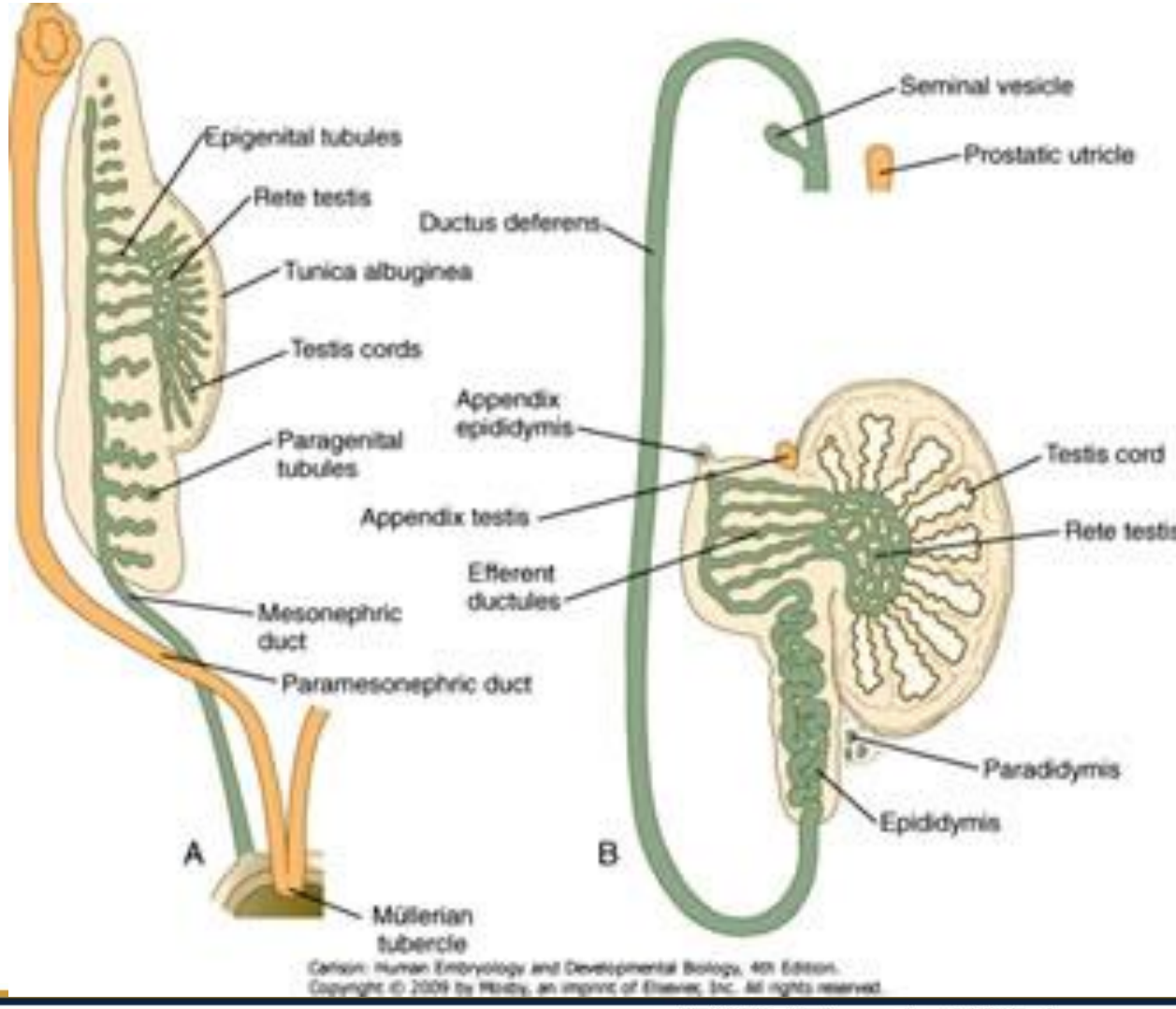
Derivatives of mesonephric tubules and duct: SAQ

1. Derivatives of mesonephric tubules:

- develop to **form the primary male genital ducts**.
- They **give rise to the efferent ductules & appendix of epididymis**.

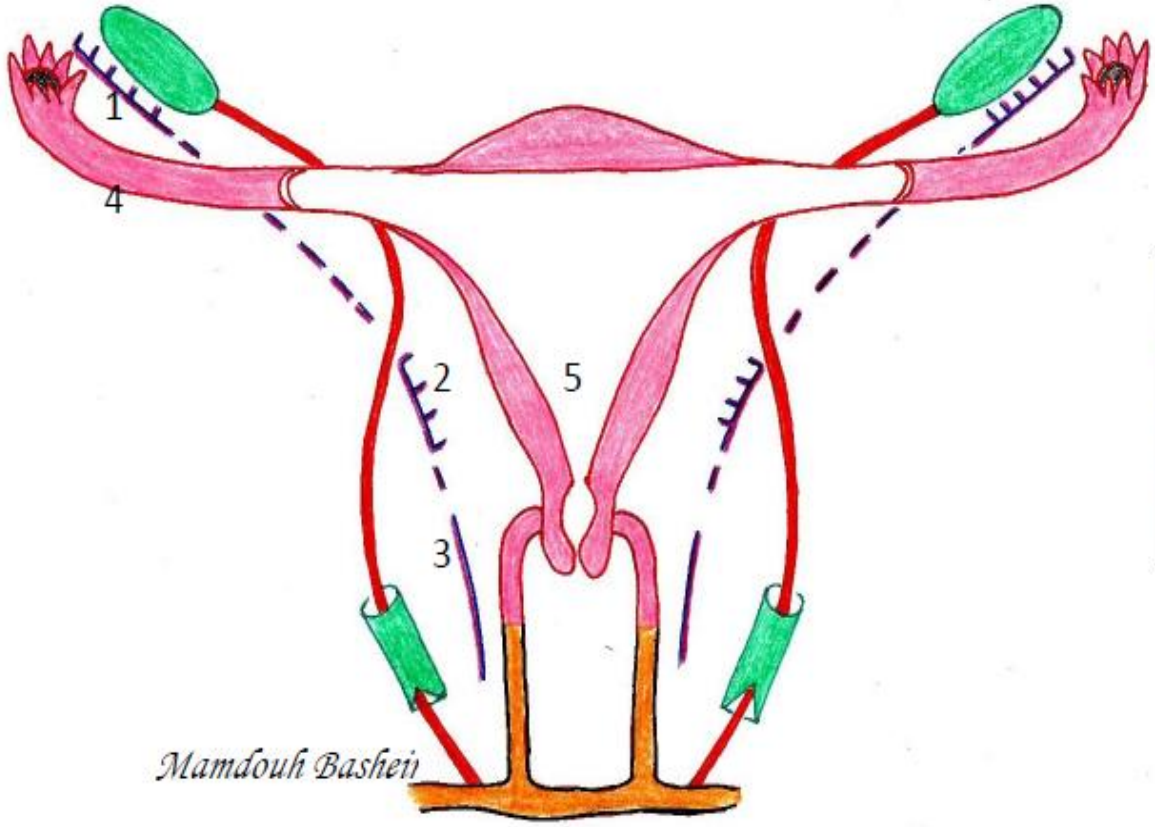
2. Derivatives of mesonephric duct:

Give rise to epididymis, vas deferens and seminal vesicles & ejaculatory duct



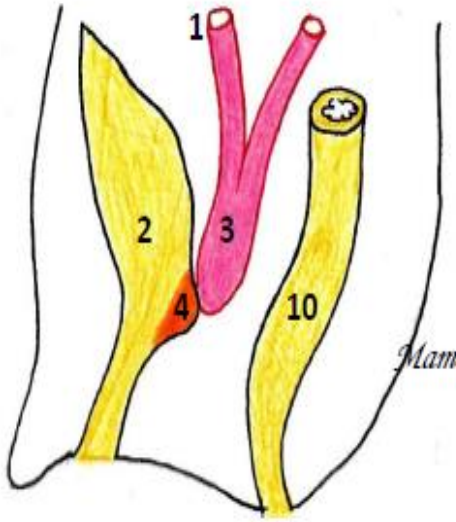
Remnants of mesonephric duct in female

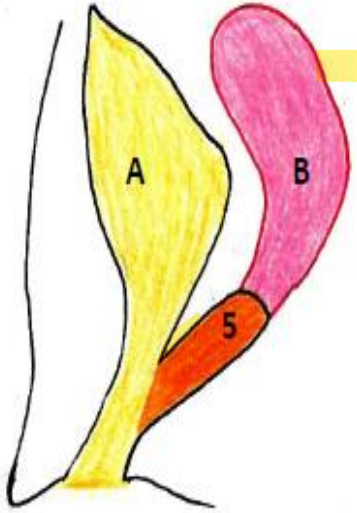
1. **The Mesonephric Tubules degenerate** and forms the **Epoophoron and Paroophoron** which are contained in the broad ligament of the uterus.
2. **The Mesonephric Duct** forms **the ureteric bud** (which joins the metanephric kidney) and part of the urinary bladder and urethra. The remaining part degenerates and join the lateral walls of the cervix and vagina, forming the **Gartner's duct**.



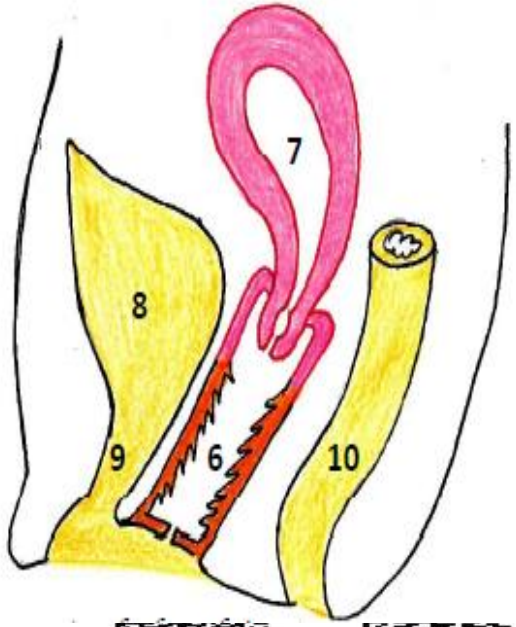
1) Epoophron
2) Paroophron
3) Gardener duct
4) Fallopian tube
5) Uterus

I. Development of Female genital duct (fate of paramesonephric duct)





1) Paramesonephric duct
2) Urogenital sinus
3) Utrovaginal canal
4) Mullerian tubercle
5) Vaginal plate
6) Lower part of vagina
7) Uterus & upper part of vagina
8) Urinary bladder
9) Urethra
10) Rectum



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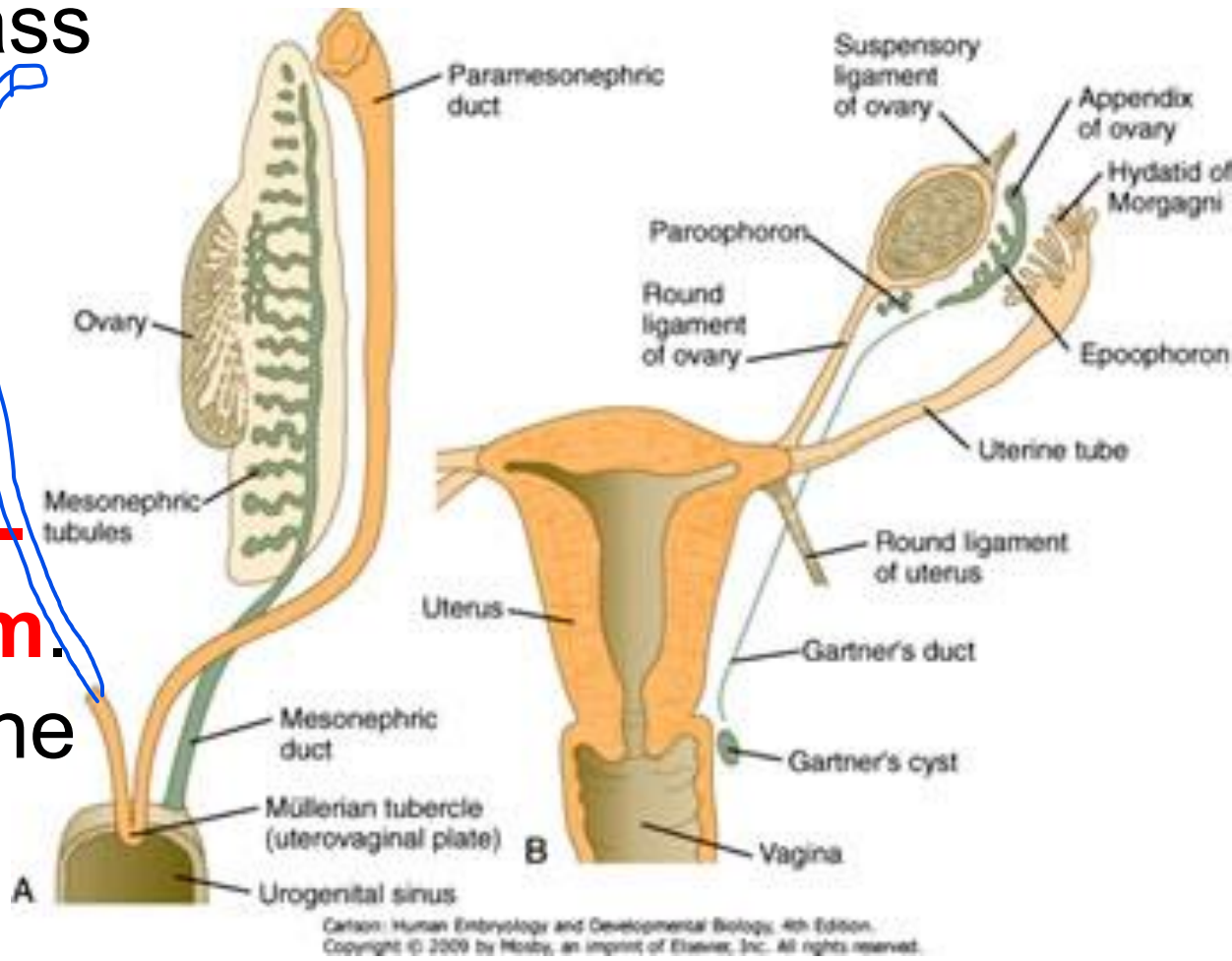
Process of the development

1. The paramesonephric ducts pass caudally parallel and lateral to the mesonephros
2. The paramesonephric ducts approach each other in the median plane and fuse to form a **Y-shaped utero-vaginal primordium**.
   =projects into the dorsal wall of the urogenital sinus and produces an elevation called the **Mullarian tubercle**, in the **9th week** development.



The fate of paramesonephric ducts in females

SAQ

I. The cranial vertical part forms the uterine tube.

2.The intermediate horizontal part

forms the fundus and most of the body of the uterus.

3.The caudal vertical part

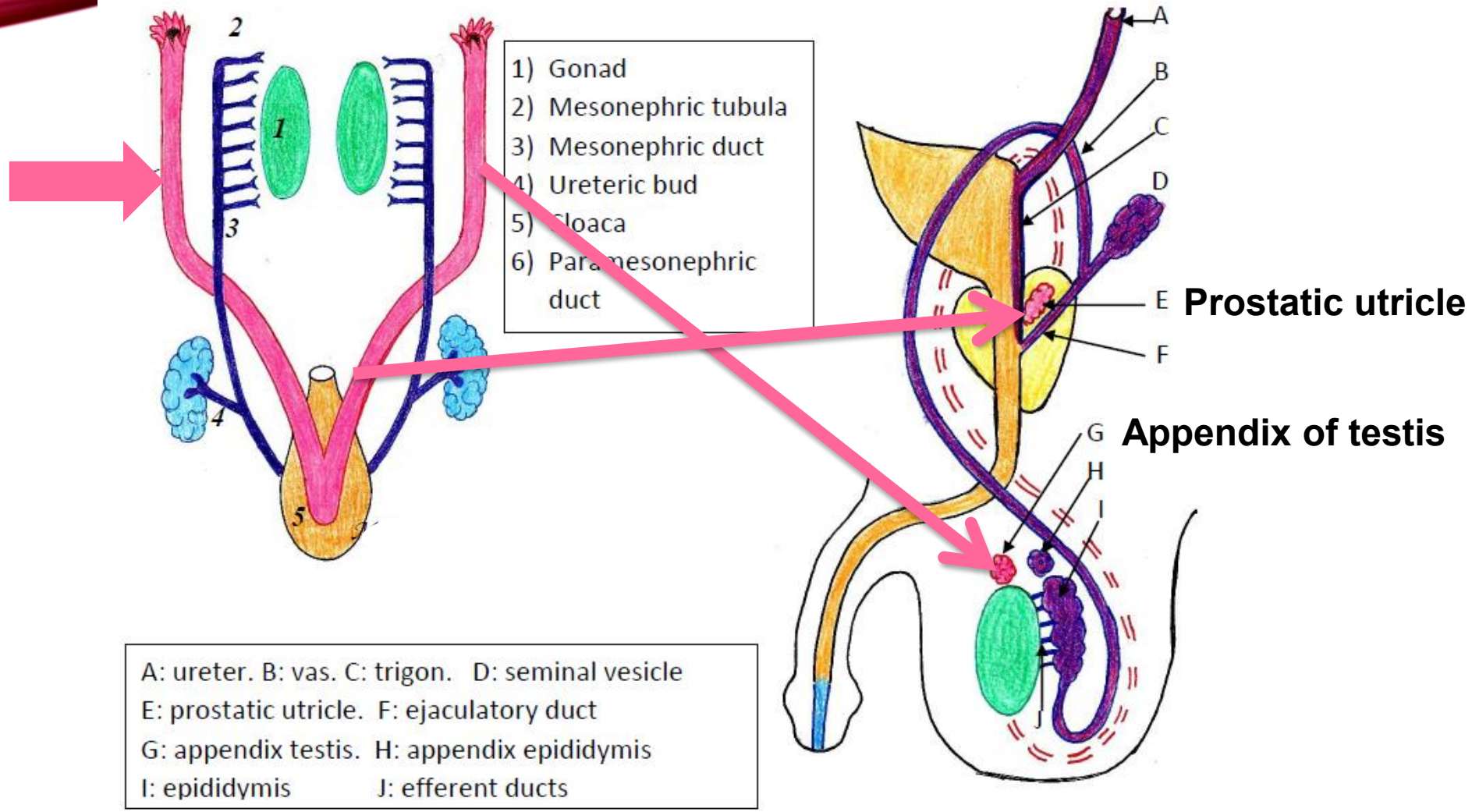
fuse together and form the utero-vaginal canal.

=which gives rise to the cervix and the vagina.

The fate of paramesonephric ducts in males

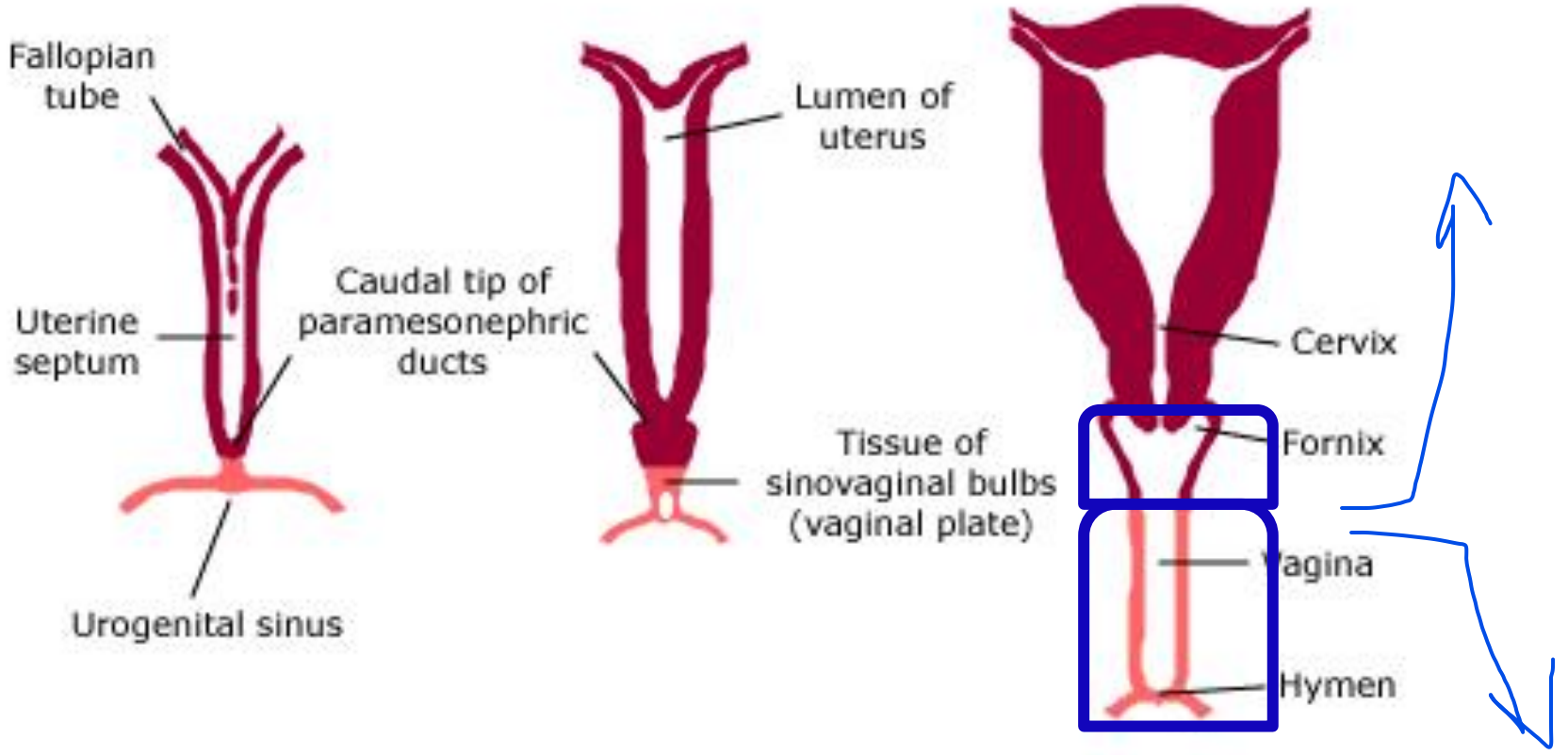
-The paramesonephric duct degenerates and disappears except at its two ends:

1. The cranial end persists as **the appendix of the testis**. MCQ
2. The caudal end of the two tubes **persist as the prostatic utricle**.



Remnants of paramesonephric duct in male

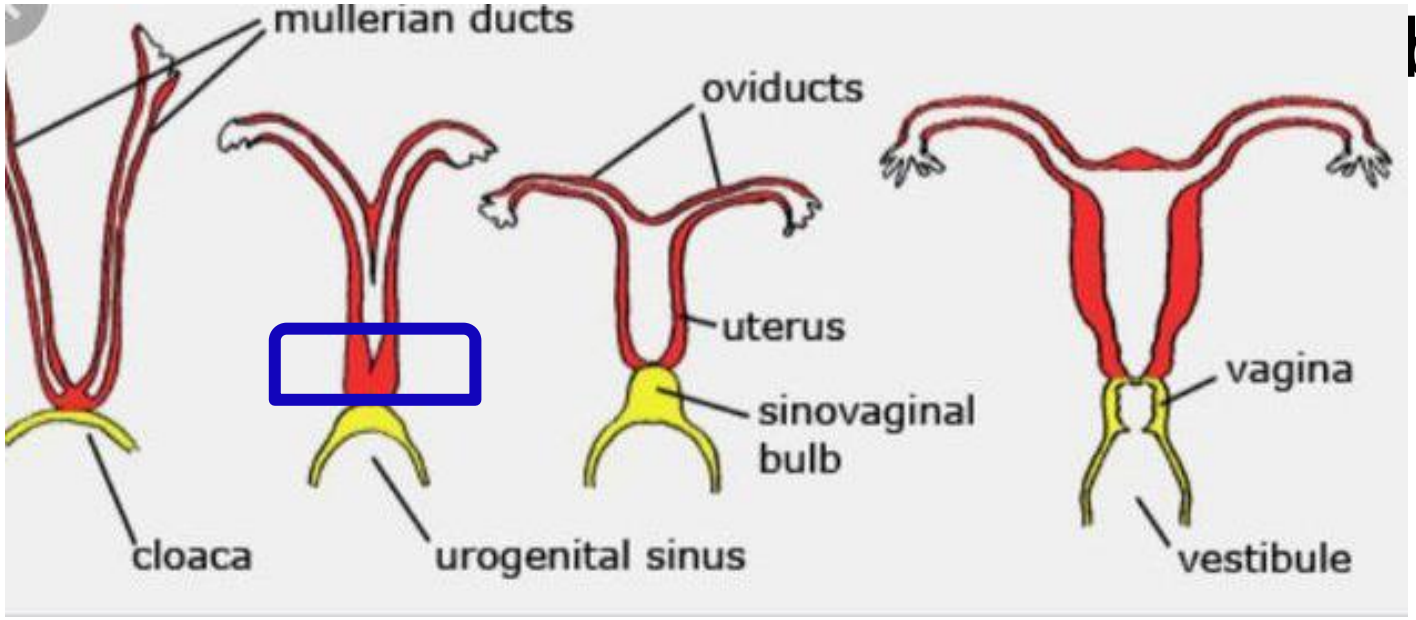
Development of vagina

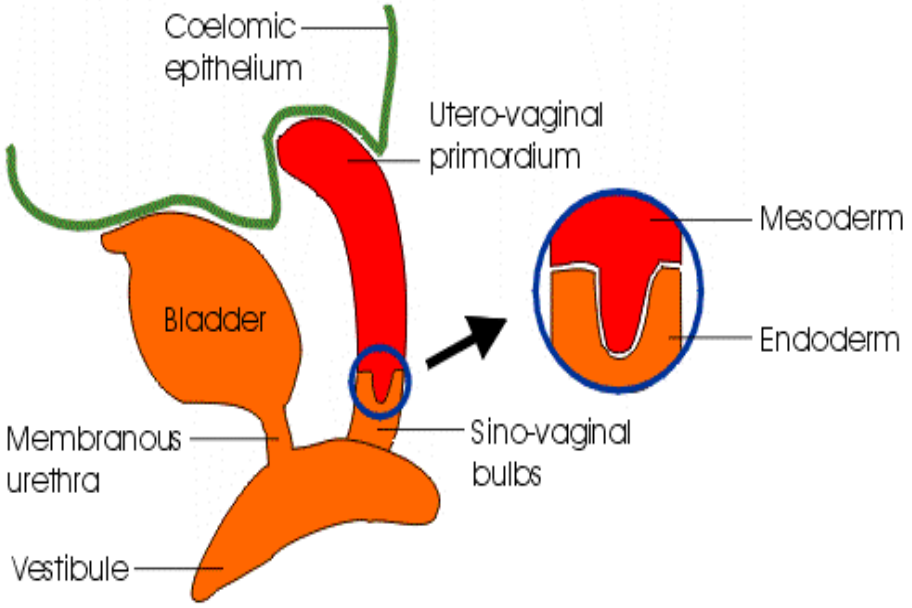


A. The upper one-third of the vagina:

= **Mesodermal** in origin. MCQ

= From the caudal vertical part of the paramesonephric (mullerian ducts) which fuse together and form the uterovaginal canal that opens in the dorsal wall of the be

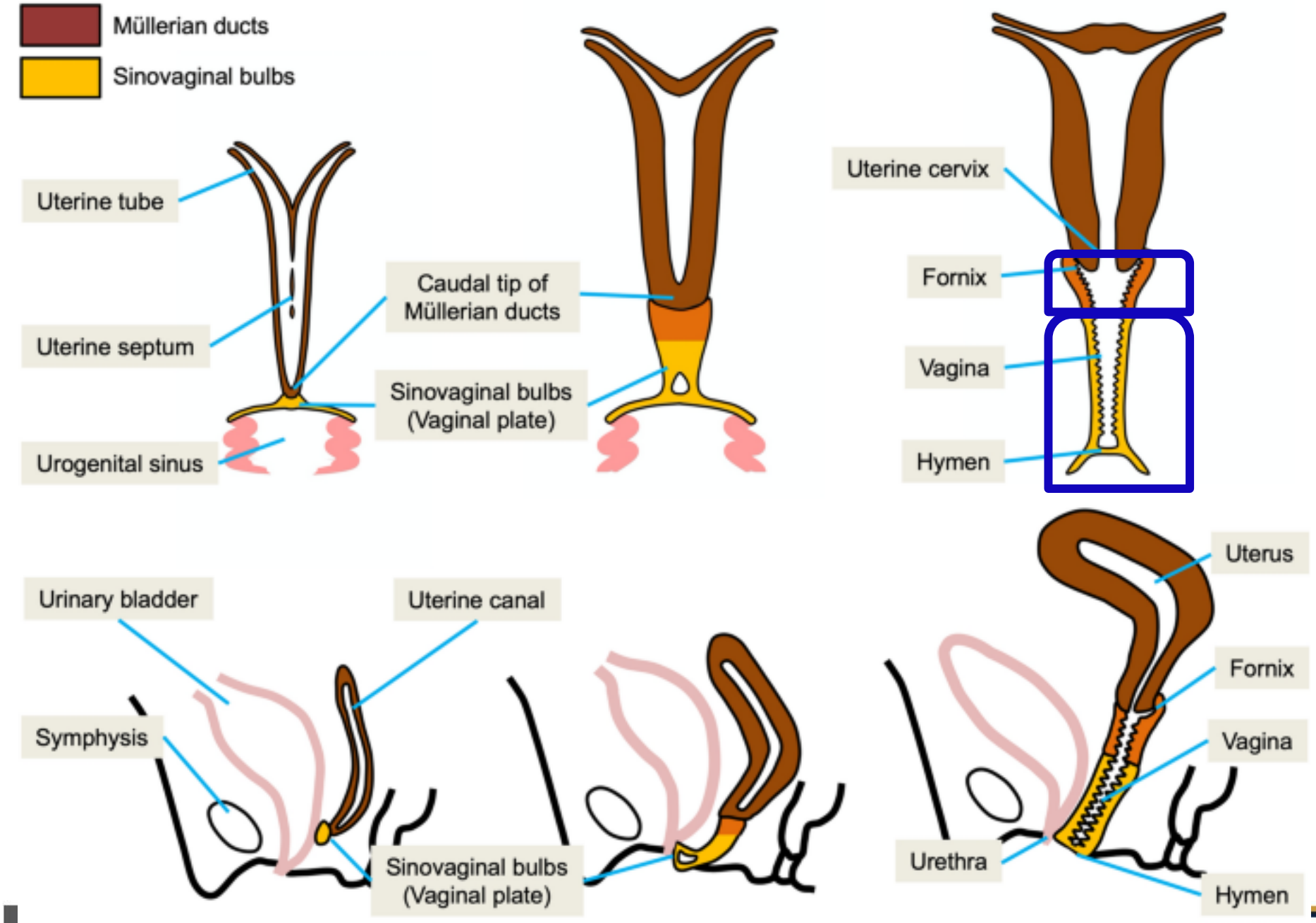




B- The lower two-thirds of the vagina:-

=**endodermal** in origin.

1. From the **pelvic part of the urogenital sinus**. It forms solid plate (the **vaginal plate**).
2. The central cells of this plate break down, forming the **lumen of the vagina.**
3. The lumen of the vagina remains separated from that of the urogenital sinus by a thin tissue plate, known as the **hymen**.

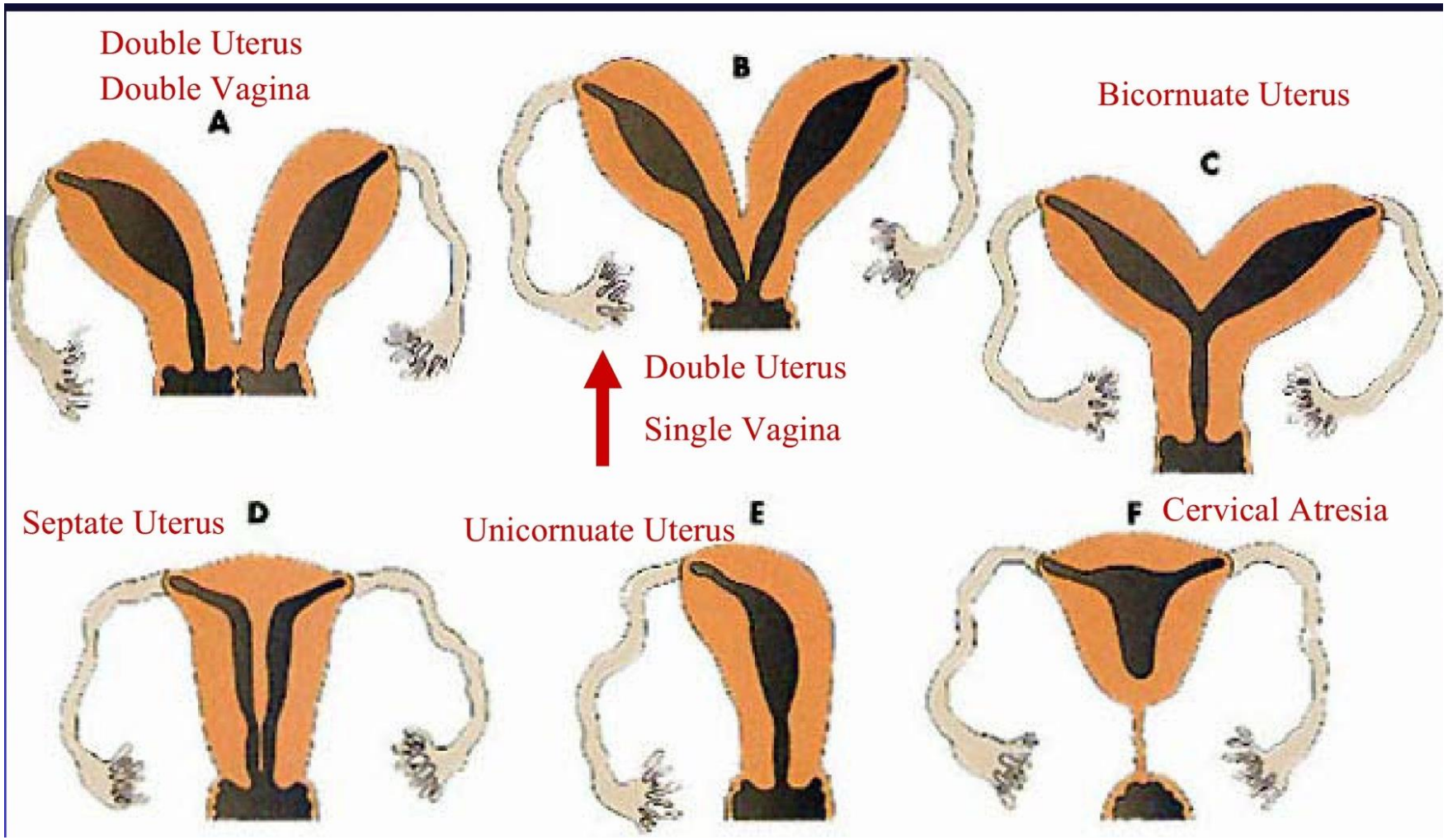


a. Fusion of Müllerian ducts

b. Induction of vaginal plate

c. Canalization of vaginal plate

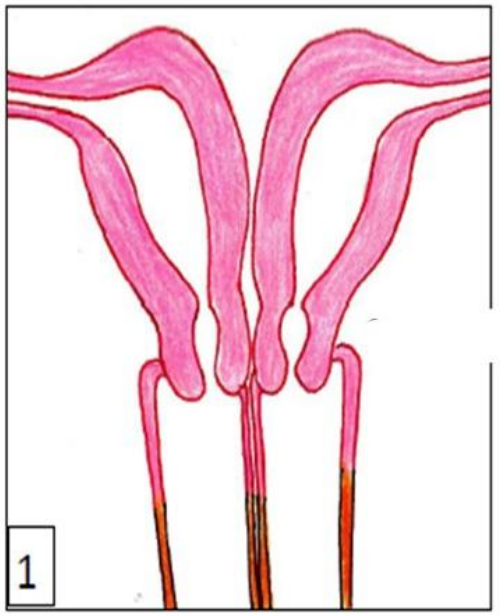
Anomalies of uterus and vagina



1. Uterus didelphys: MCQ

☒ **Cause:** Complete failure of fusion of the two paramesonephric ducts.

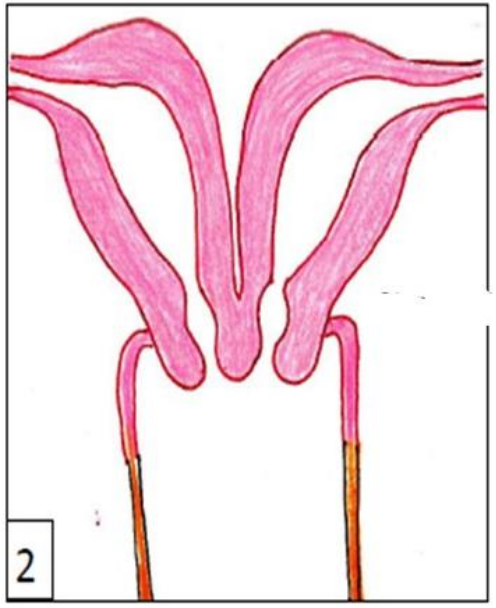
☒ **Feature:** double uterus, double cervix and double vagina.



2. Uterus bicornis bicollis:

☒ **Causes:** Failure of the intermediate parts of the two paramesonephric ducts to fuse.

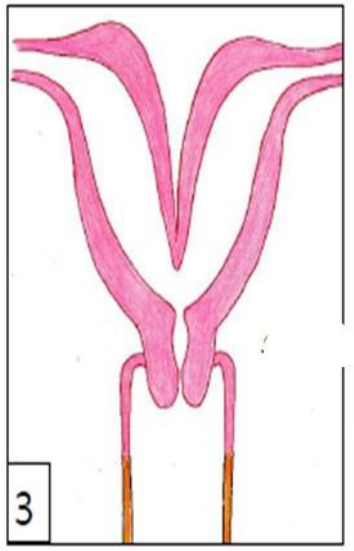
☒ **Features:** Double uterus, double cervix and single vagina.



3. Bicornuate uterus:

☒ **Cause:** incomplete canalization of the superior part of the paramesonephric ducts.

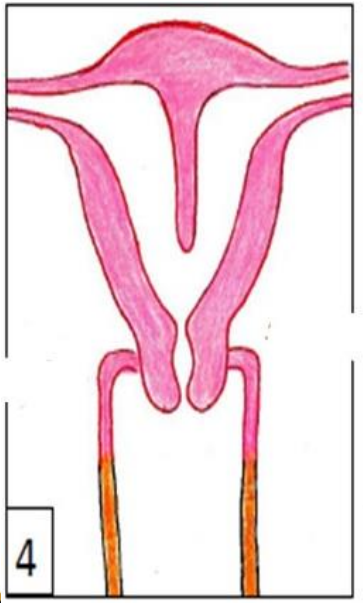
☒ **Features:** Duplication involves only the superior part of the body of the uterus.



4. Bipartite uterus:

☒ **Cause:** Incomplete canalization of the intermediate part of the of the paramesonephric ducts.

☒ **Features: There is a septum dividing the uterine cavity into two cavities.**



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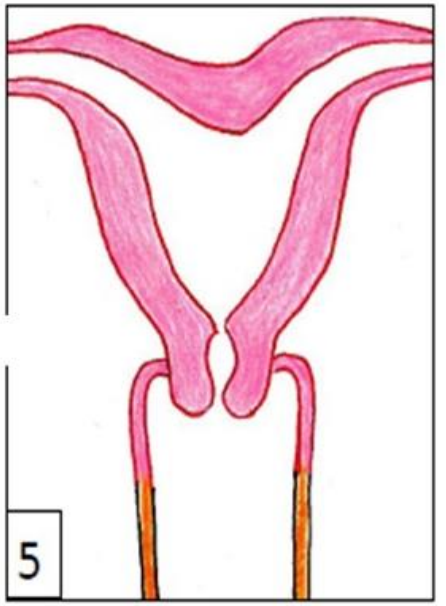
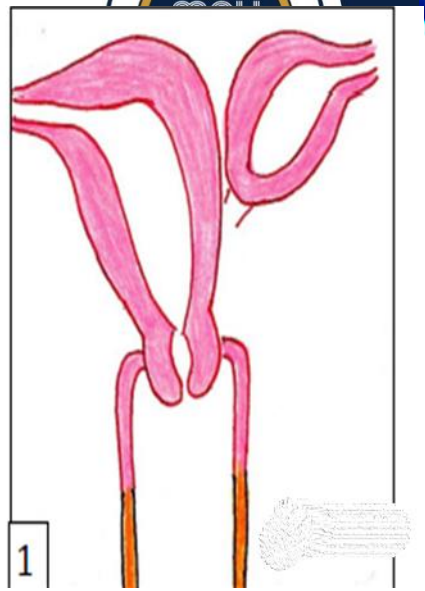
5. Arcuate uterus:

☒ **Cause**: Incomplete fusion of the intermediate part of the paramesonephric ducts.

☒ **Features: The fundus of the uterus is depressed in its middle part.**





6. Bicornuate uterus with a rudimentary horn:

☒ **Cause:** Failure of one paramesonephric duct to complete its development and fuse with the other duct.

☒ **Feature**: One vagina and cervix and the uterus have two horns; one develop and the other rudimentary.

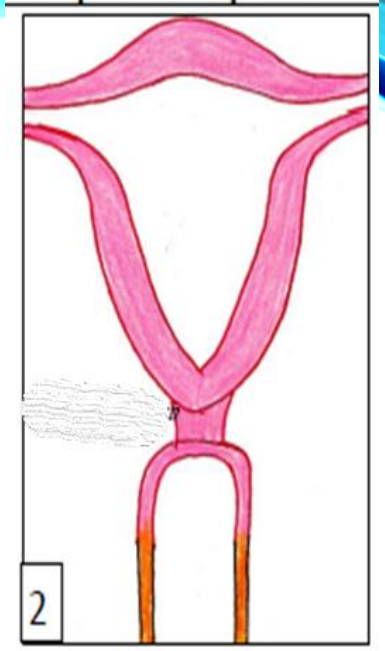
7. Unicornuate uterus:

☒ **Cause:** One paramesonephric duct fails to develop.

☒ **Feature**: One uterine tube, one horn of the uterus.

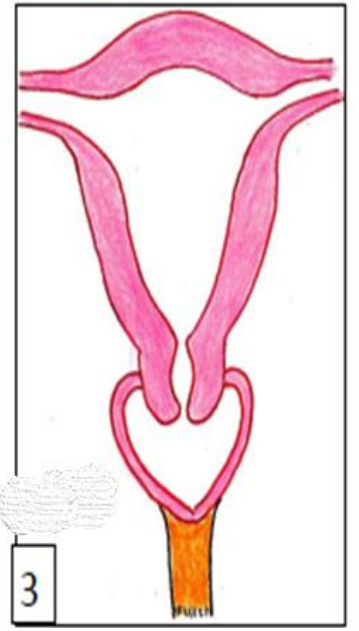
8. Cervical atresia:

- ☒ **Cause:** Failure of canalization of the cervix.
- ☒ **Feature**: A septum obliterate the cervical lumen.



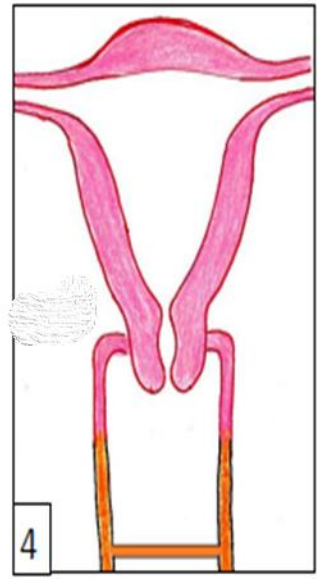
9. Vaginal atresia:

- ☒ **Cause:** Failure of canalization of the vagina.
- ☒ **Feature**: A transverse vaginal septum obliterate the vaginal lumen.



10. Imperforate hymen:

- **Cause:** Failure of degeneration of the central part of the hymen.
- **Features**: in adult, this condition represented by delay menstrual cycles.



11. Infantile or rudimentary uterus: underdevelopment of the fused intermediate part of the paramesonephric ducts. The adult uterus is small than normal.

12. Absence of the vagina and uterus:

- **Cause**: Failure of the development of both paramesonephric ducts.
- **Features**: Absence of vagina, uterus and uterine tube.

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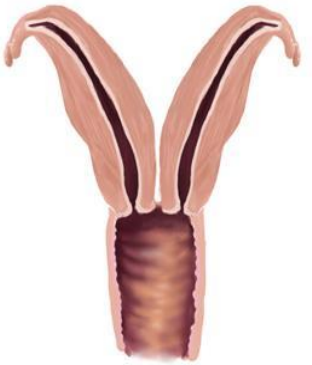
Congenital Müllerian Anomalies

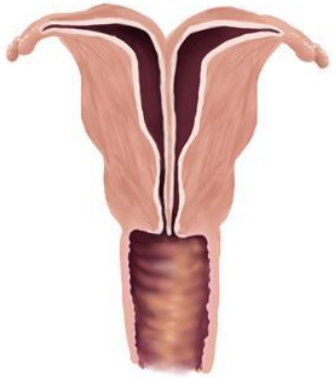
Normal uterus

Class I: Uterine hypoplasia and/or agenesis

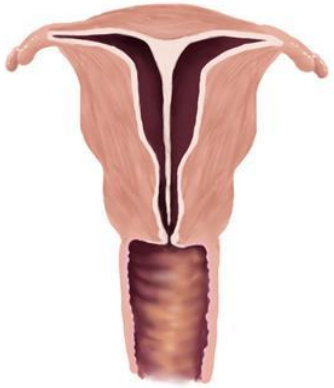
Class II: Unicornate uterus



Class III: Uterus didelphys



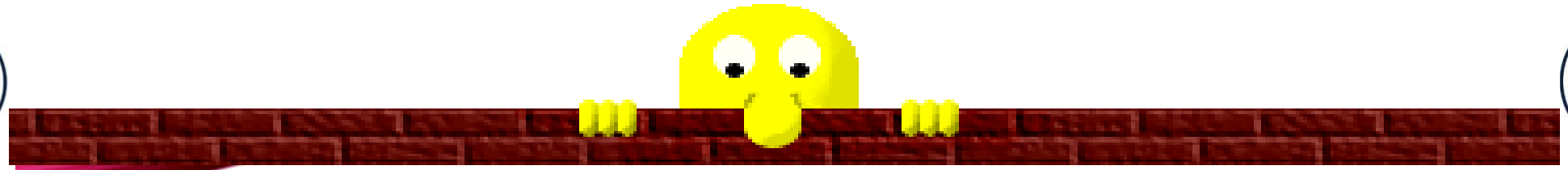
Class IV: Bicornuate uterus



Class V: Septate uterus

Class VI: Arcuate uterus

Class VII: Diethylstilbestrol (DES) drug related



(2)-Development of the external genital

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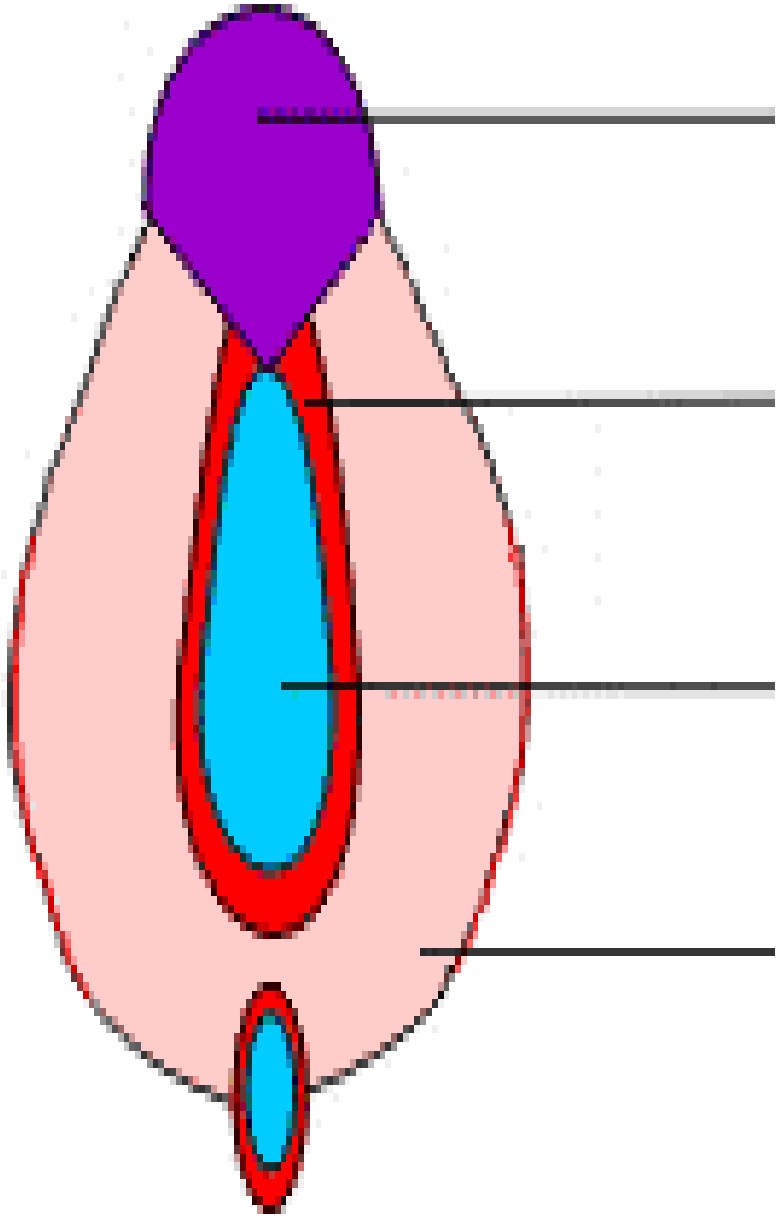

Genital tuberde MESO

MCQ

Urogenital folds ECTO

MCQ

Urogenital membrane

MCQ

Labioscrotal folds MESO

External genitalia at 7 weeks (undifferentiated)

B. The different stage in Male:

1. **The genital tubercle:** undergoes growth and elongation to form the **penis**.
2. **The urogenital folds:** fuse to enclose the **spongy urethra**.
3. **The labioscrotal folds:** fuse at the midline to form the **scrotum**.

The penile prepuce forms around 12 weeks.

The development of the male external genitalia is typically complete by 12 weeks of development.

B. The different stage in female:

1. **The genital tubercle:** undergoes little growth and elongation to form the clitoris.
2. **The urogenital folds:** form labia minora.
3. **The labioscrotal folds:** fuse at the midline to form the labia majora.

The development of the female external genitalia is typically complete by 12 weeks of development.

Anomalies of the external genitalia

1)Hermaphrodites (intersex):

A. True hermaphrodites: both ovarian and testicular tissue is combined & external genitalia predominantly female.

B. Female pseudo-hermaphrodites: gonads are of ovaries while external genitalia are of **male**, congenital adrenal hyperplasia (adronogenital syndrome)

C. Male pseudo-hermaphrodites: gonads are testis while external genitalia are of **female**. Most common cause is **androgen insensitivity syndrome**. MCQ

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2. Agenesis of external genitalia:

Cause: failure of genital tubercle to develop.

Feature: Absence of penis or clitoris. The urethra opens into the perineum near the anus.

3. Micropenis: abnormal small penis

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ANATOMY & DEVELOPMENT OF THE BREAST

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By
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Anatomy of Female Breast

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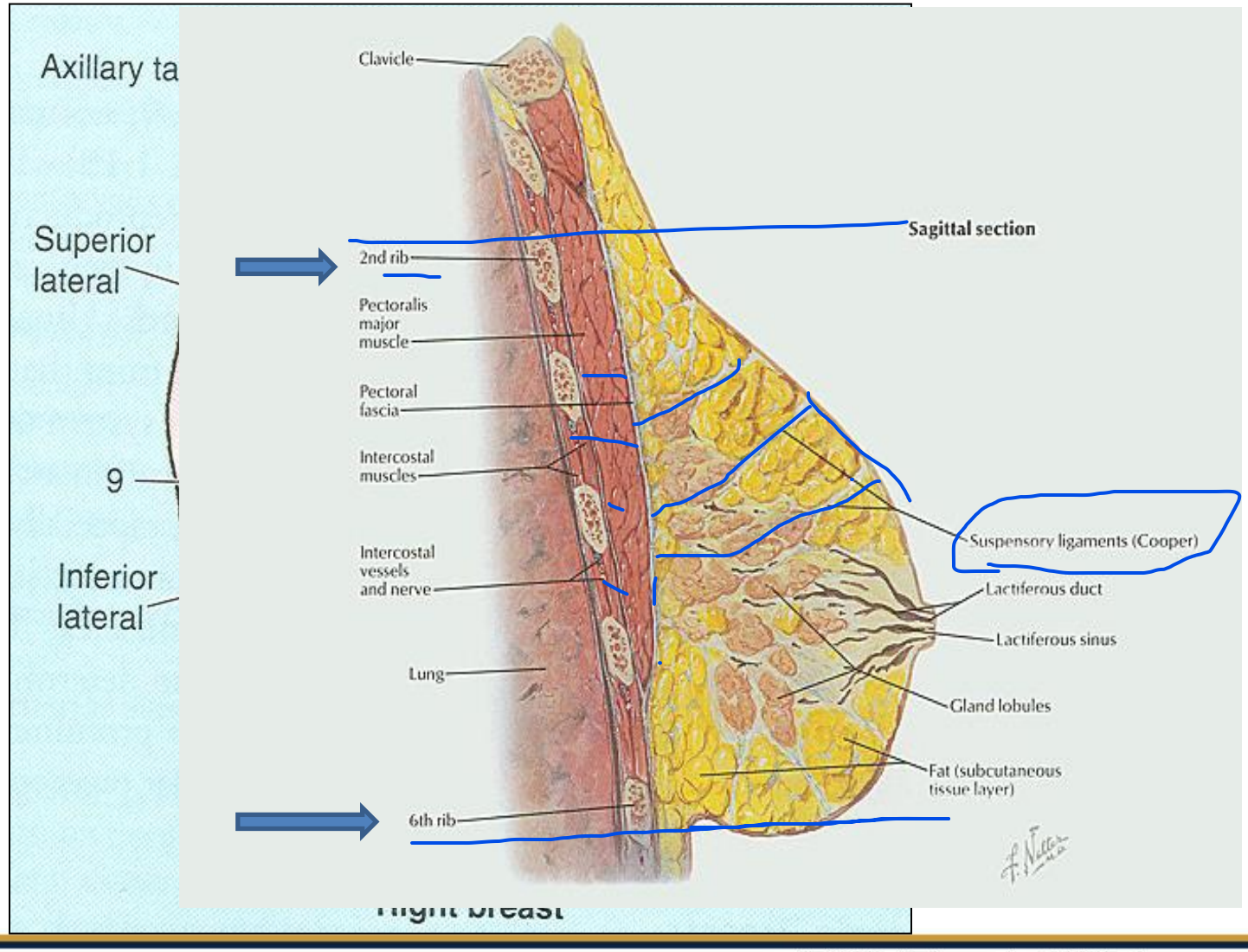
Position and Extension of the breast

- **Its base extends from 2nd to 6th ribs.**
- **It extends from the sternum to the midaxillary line laterally.**
- **It has no capsule.**
- **Axillary tail (Tail of Spence):** small part that extends upwards and laterally, pierces the deep fascia at the lower border of the pectoralis major and comes in contact with the axillary vessels. It contains a large amount of glandular tissue and is the site of 60 % of carcinomas of the breast

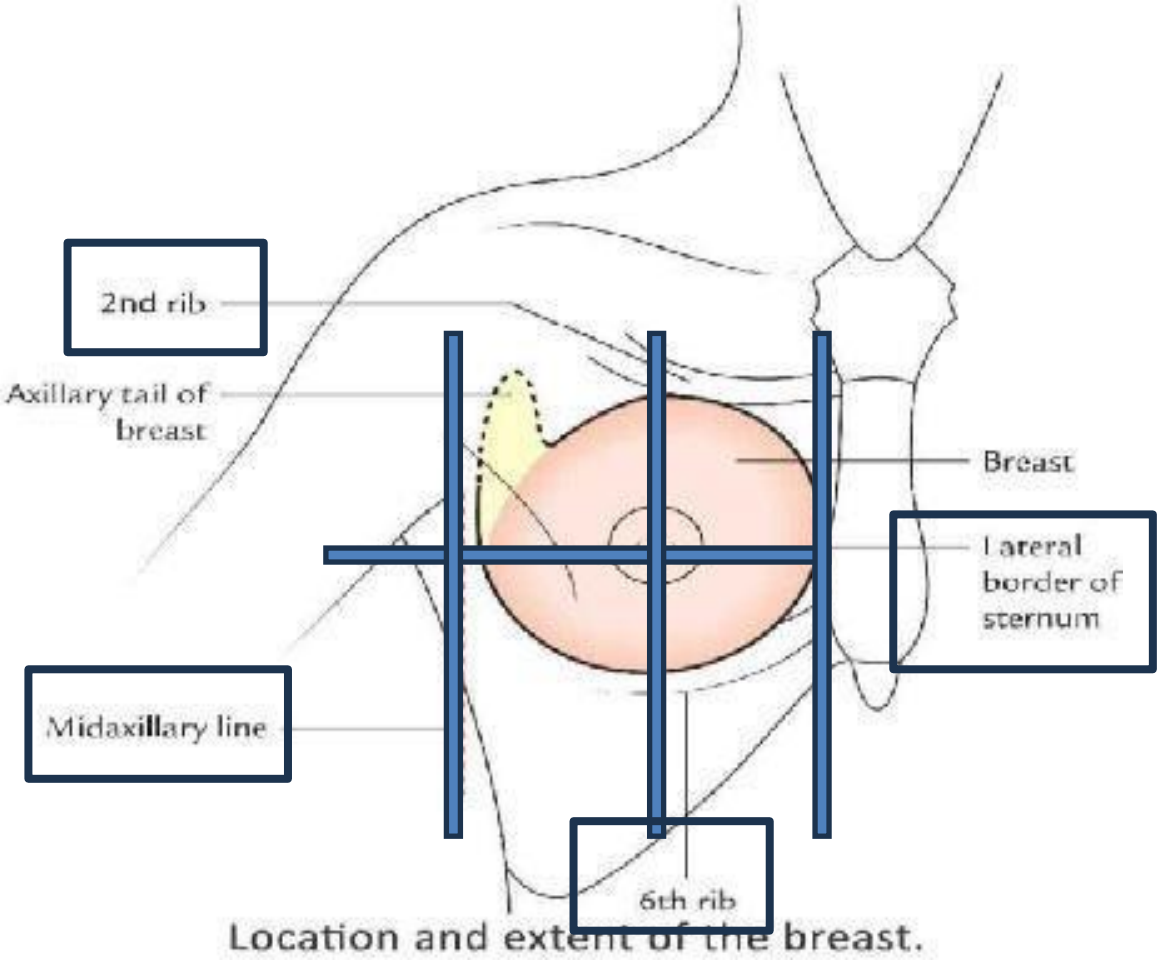


Extension of the Gland

1. Vertical extension: Along the mid-clavicular line from 2nd to 6th rib. MCQ

2. Horizontal extension :At level of 4th rib from lateral margin of sternum to mid-axillary line

3. The nipple lies opposite 4th intercostal space. MCQ



Location and extent of the breast.

Deep relations of the breast

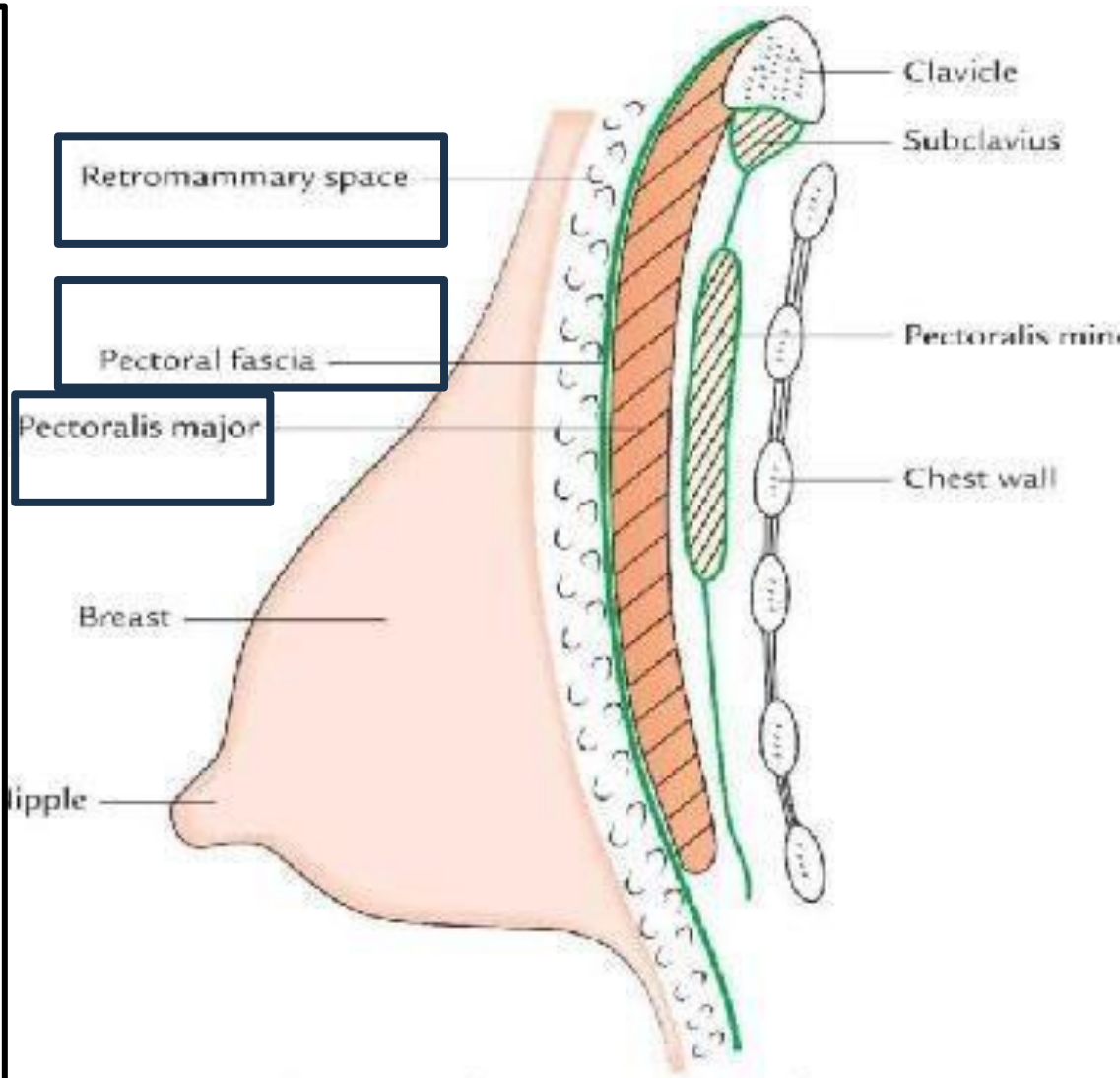
Breast bed: SAQ

Retro-mammary space:- Makes the breast movable over pectoralis major muscle.

Pectoral fascia [deep fascia]: covers pectoralis major.

Muscular bed:-

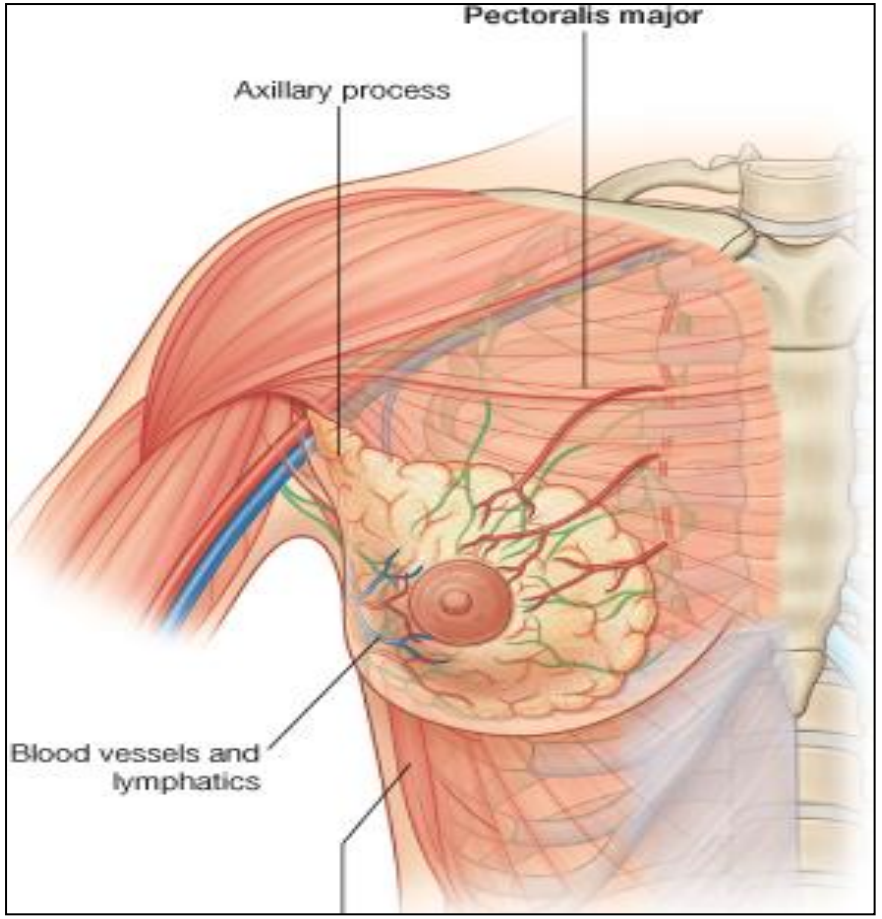
i. **Pectoralis major:** **supero-lateral ⅔** of breast lies on it.
ii. **Serratus anterior.** **Infro-lateral part**
iii. **External oblique aponeurosis:-** **lower ⅓** of breast lies on them



PARTS OF MAMMARY GLAND

Areola :

- It is a dark pink brownish circular area of skin that surrounds the nipple.
- The subcutaneous tissues of nipple & areola are devoid of fat.
- It contains sebaceous glands called areolar gland (Montgomery Glands) which produces tubercles on the skin of the areola.



PARYNCHYMA OF MAMMARY GLAND

It is formed of **15-20 lobes.** MCQ

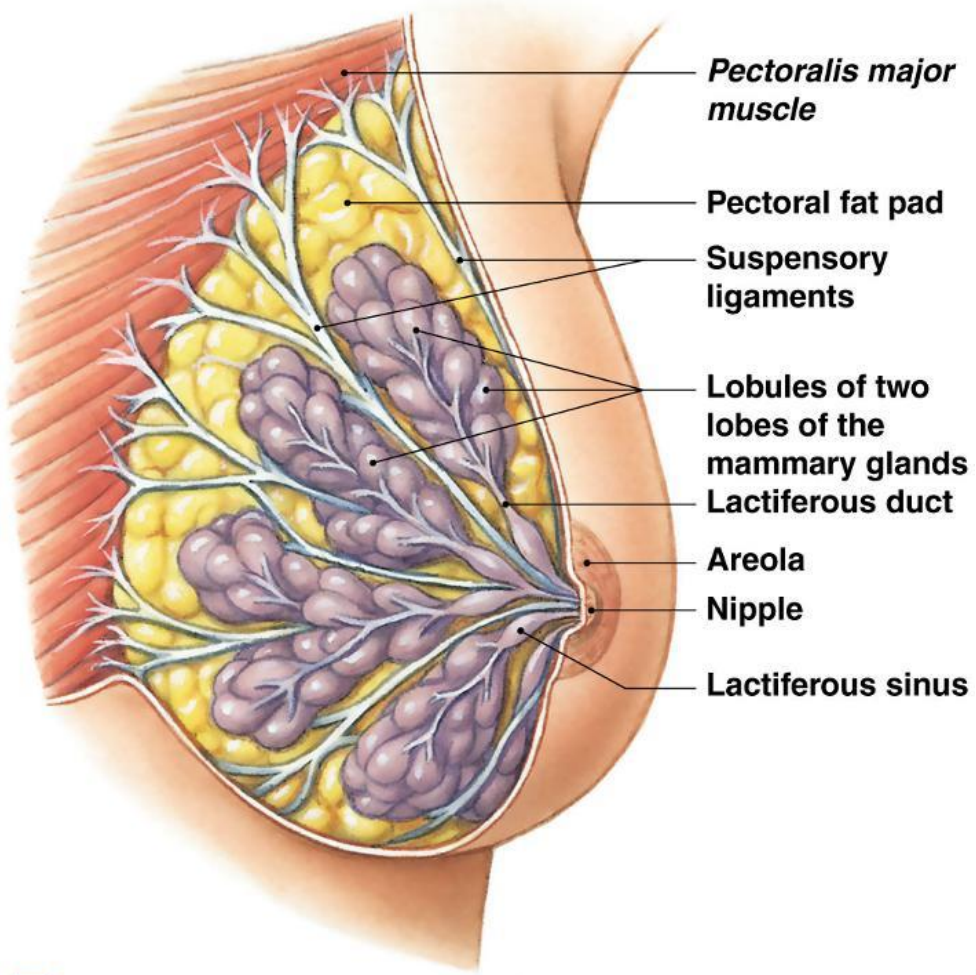
Each lobe is formed of a number of lobules.

The lobes and lobules are separated by interlobar and interlobular fibrous & fatty tissue, called **ligaments of Cooper**.

Q: Importance ligaments of Cooper?

These ligaments give the breasts support by connecting the skin of the breasts to the pectoralis muscles below them.

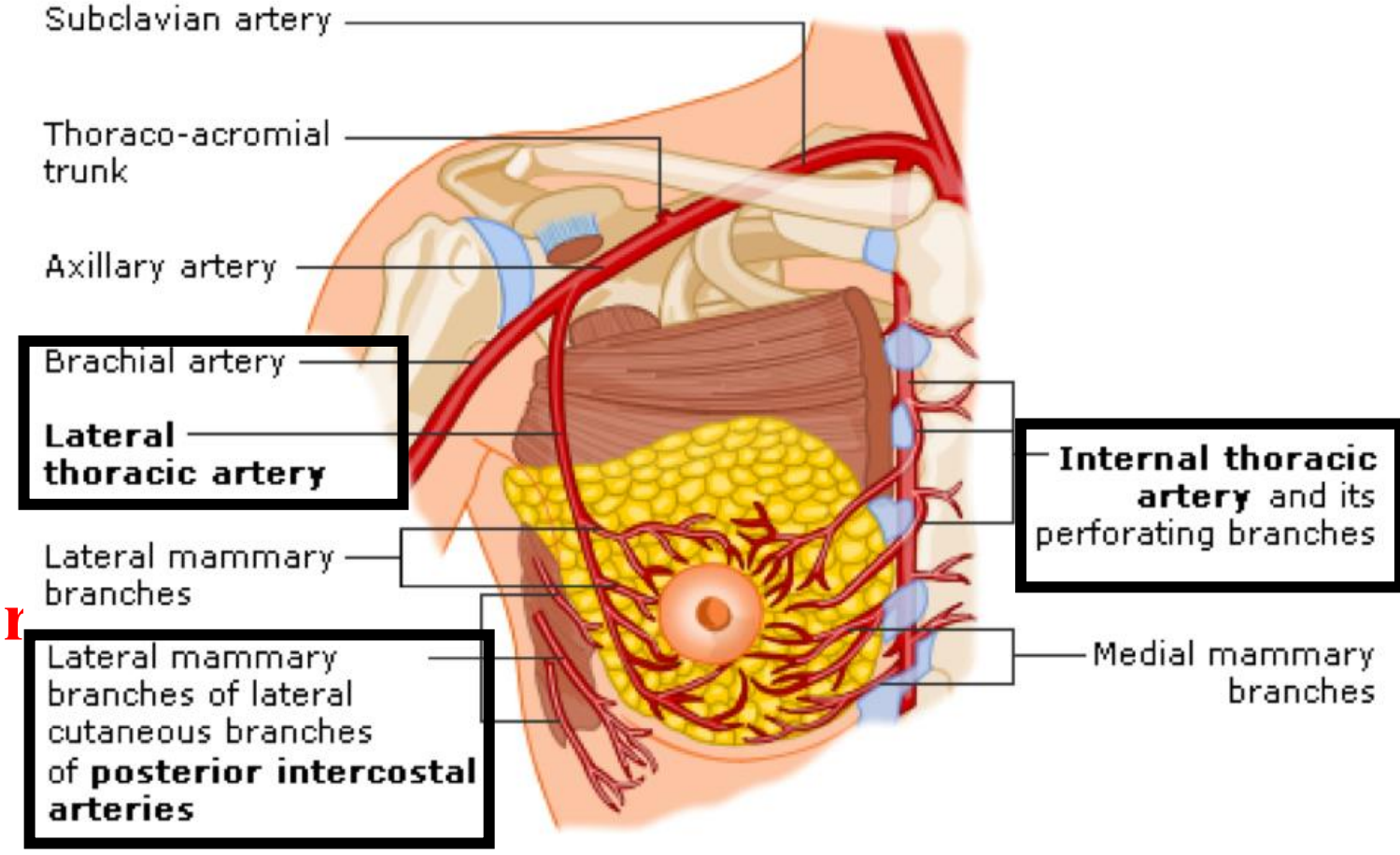
It has from **15-20 lactiferous ducts** which open by the same number of openings on the summit of the nipple.



a The mammary glands of the left breast

ARTERIAL SUPPLY

1. Perforating branches of **internal thoracic (mammary) artery.**
2. Perforating branches of 2nd, **3rd,4th intercostal arteries**
3. Superior thoracic, acromiothoracic & lateral thoracic branches of **axillary artery**
4. Mammary branches of **posterior Intercostal arteries.**



1. Lymphatics from skin covering mammary gland:-

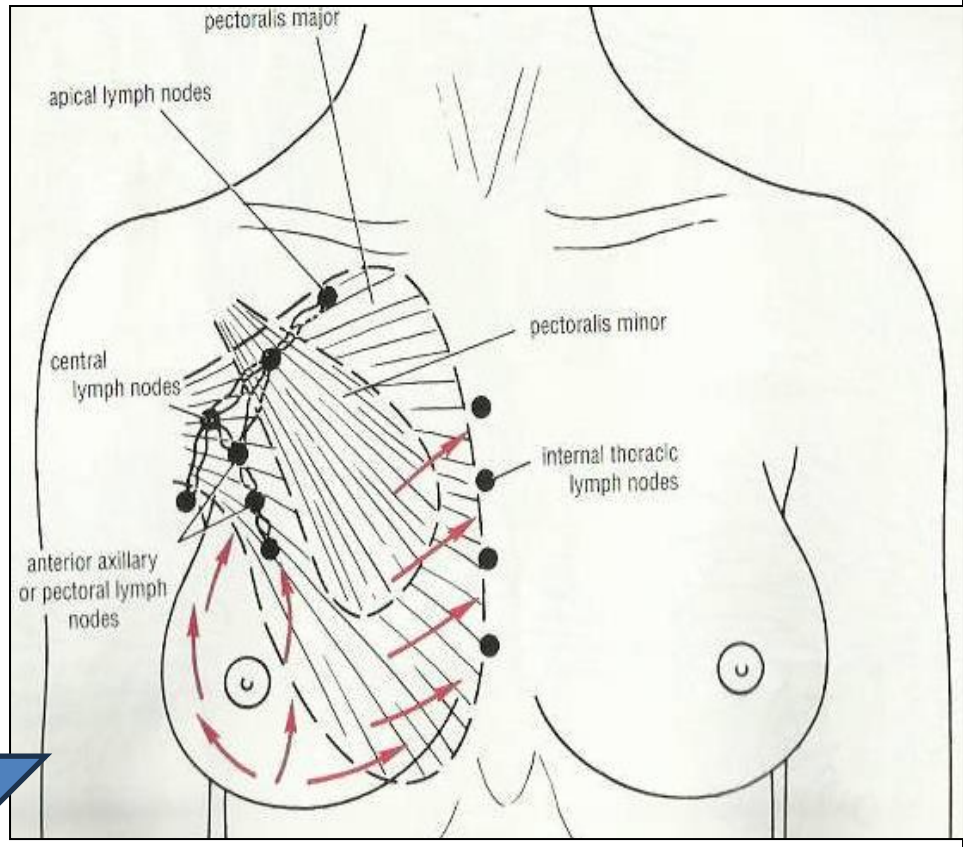
A. Skin covering lateral part of breast: to ipsilateral anterior [pectoral] axillary L.N.

B. Skin covering medial part of breast: to ipsilateral & contralateral parasternal L.N.

C. Skin covering upper part of breast: to ipsilateral deep cervical L.N.

D. Skin covering Lower part of breast: to ipsilateral Sub-diaphragmatic and Retro-peritoneal LN

E. From nipple & areola: Pass to subareolar lymphatic plexus



2. Lymphatics of the mammary gland:

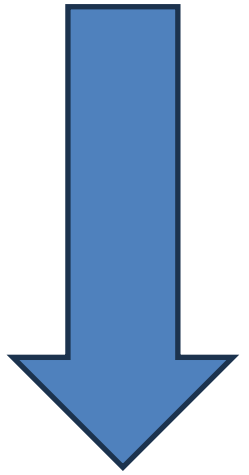
Lymphatic plexuses:

A. Superficial lymphatic plexus [sub-areolar plexus]:

Site → Beneath areola

Afferent → Receives lymph from:-

- ✓ Nipple.
- ✓ Areola.
- ✓ Central part of gland.



B. Deep lymphatic plexus [sub-mammary plexus]:

Site → In fascia of pectoralis major

Afferent → All other parts of breast

Deep Regional Lymphatics

Definition: It is an **Efferent lymphatic** from breast & their lymphatic plexus that accompany the arteries supplying the gland.

Types:-

A) Efferent from lateral & central parts of gland:

- ✓ Pass to ipsilateral anterior [**pectoral**] axillary L.N.[**main**]
- ✓ Few pass to ipsilateral **subscapular** & **apical** axillary L.N.

B) Efferent from medial parts of gland:-

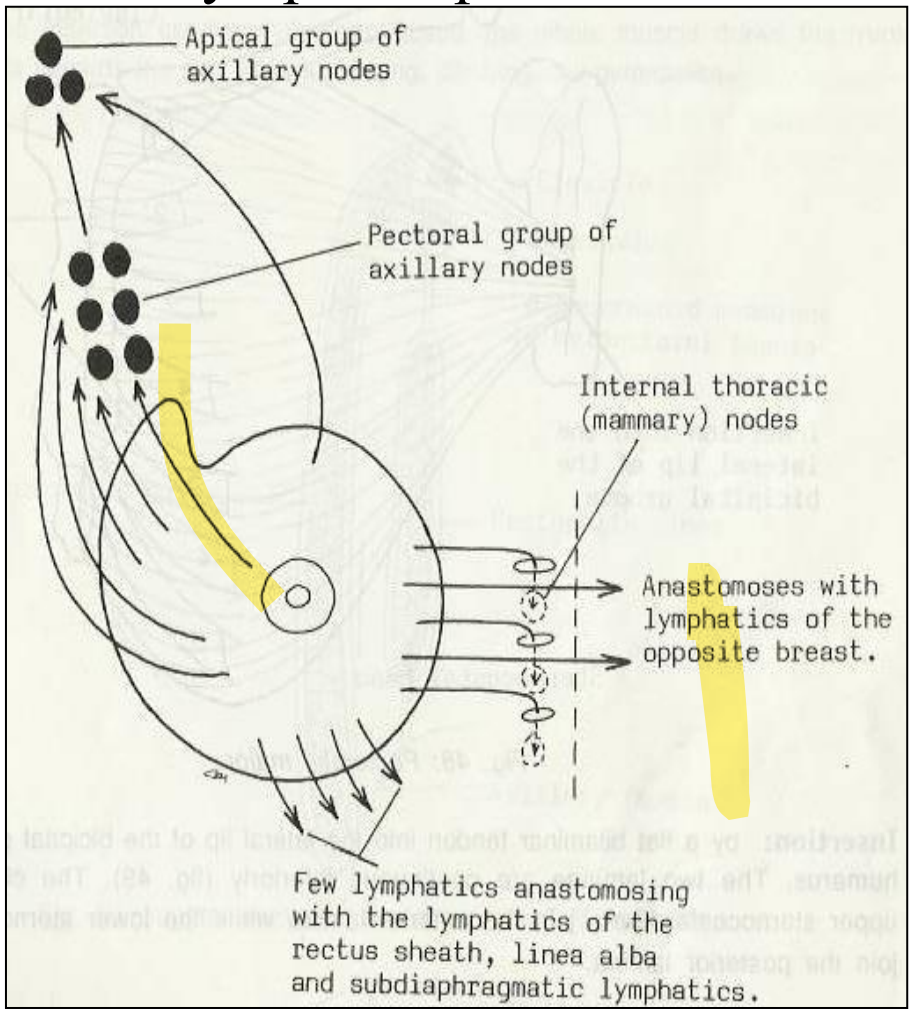
- ✓ Pass to ipsilateral & contralateral **parasternal** L.N.
- ✓ Few pass to posterior intercostals L.N.

C) Efferent from upper parts of gland:-

- ✓ Pass to ipsilateral **apical** axillary L.N.

D) Efferent from lower parts of gland:-

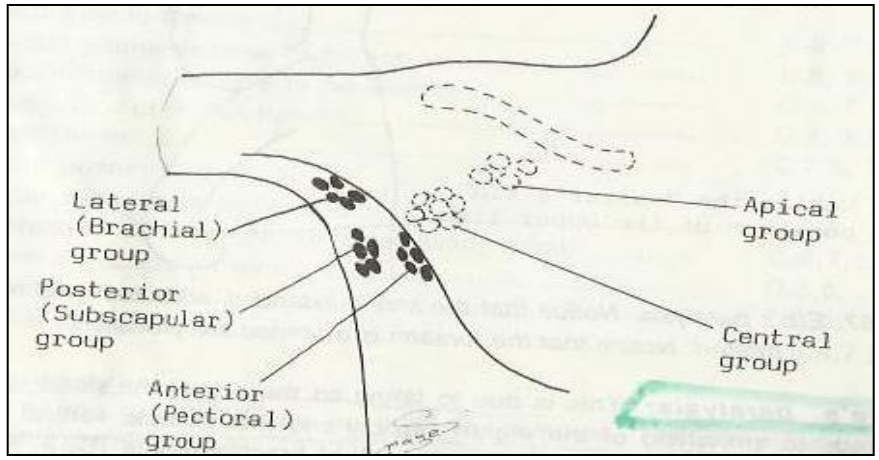
- ✓ Pass to ipsilateral **Sub-diaphragmatic & Retro-peri. L.N**

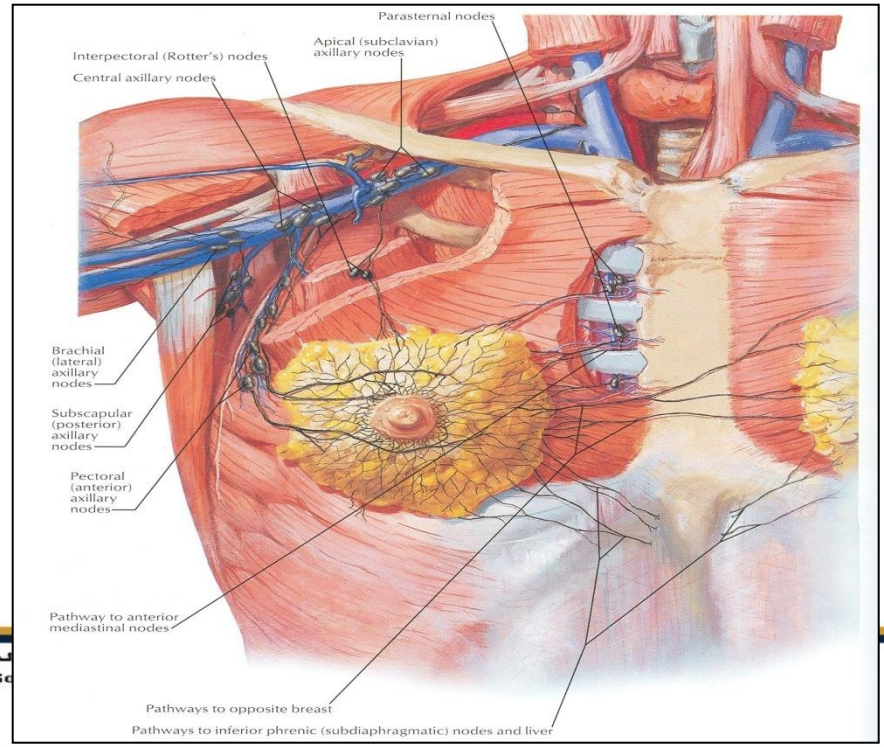


AXILLARY LYMPH NODES

AXILLARY LYMPH NODES

- They are arranged into 5 groups which lie in axillary fat : SAQ
- **Pectoral (Anterior) group :** which lies on the pectoralis minor **along lateral thoracic vessels.**
- **Subscapular (Posterior) group :** which lies on posterior wall of axilla on lower border of subscapularis **along subscapular vessels.**
- **Brachial (Lateral) group :** lies on lateral wall of axilla **along 3rd part of axillary vessels.**
- **Central group :** lies in axillary fat **at the base of axilla.**
- **Apical group :** lies **at apex of axilla.**

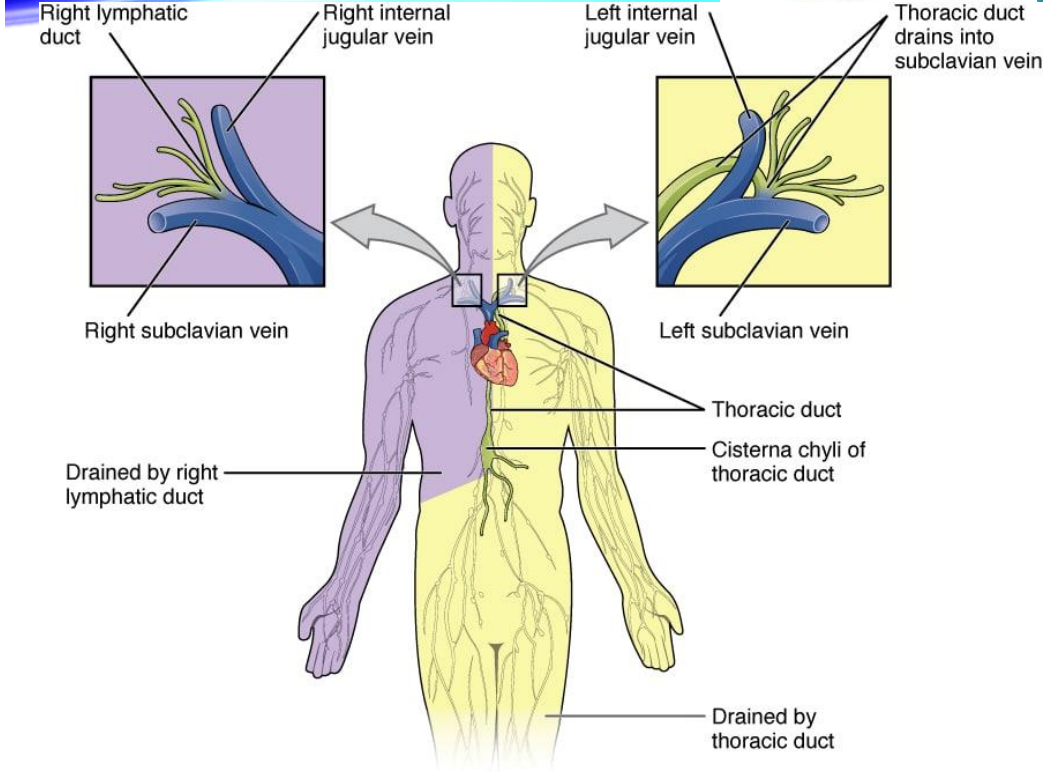


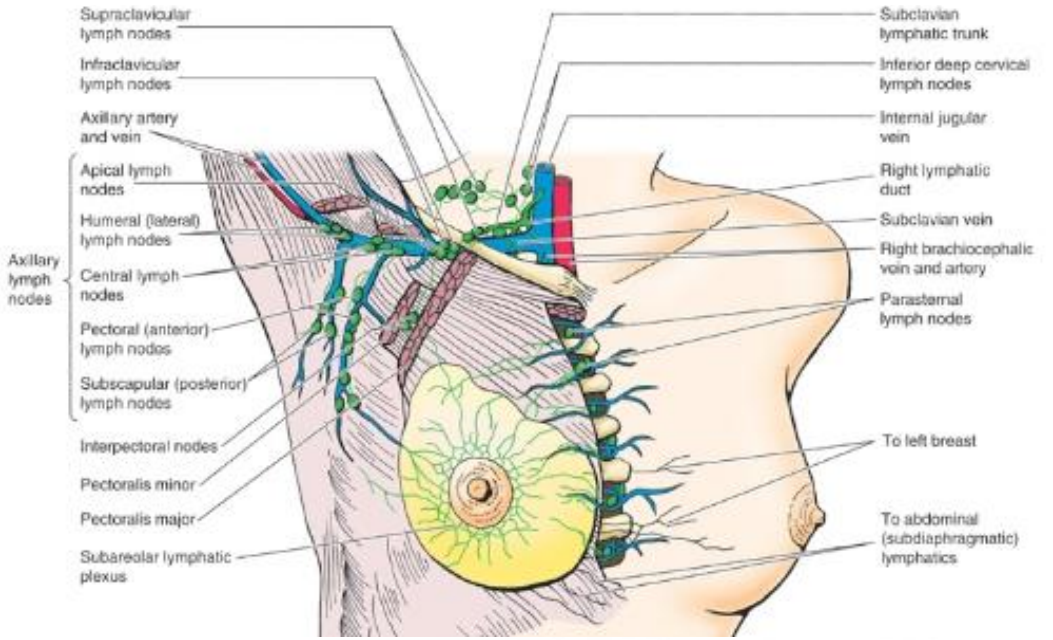


Efferent lymph vessels of **apical group**

Subclavian lymph trunk

On the right side: continues to form the **right lymphatic duct**.
On the left side: it usually opens into **thoracic duct**.

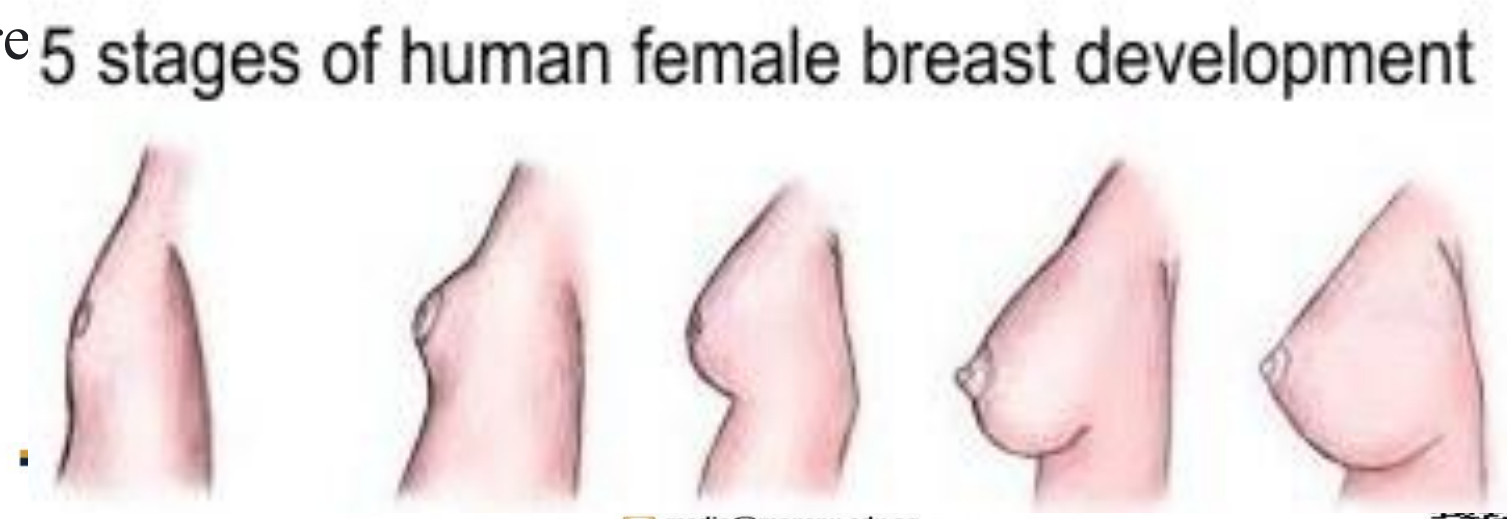




DEVELOPMENT OF FEMALE BREAST

When does breast development begin?

- Breasts begin to form while the unborn baby is still growing in the mother's uterus.
- This starts with a thickening in the chest area called the **mammary ridge or milk line** which is a downgrowth of the **epidermis (ectoderm)** into the underlying **dermis (mesoderm)**.
- By the time a baby girl is born, nipples and the beginnings of the milk-duct system have formed. In general, bre



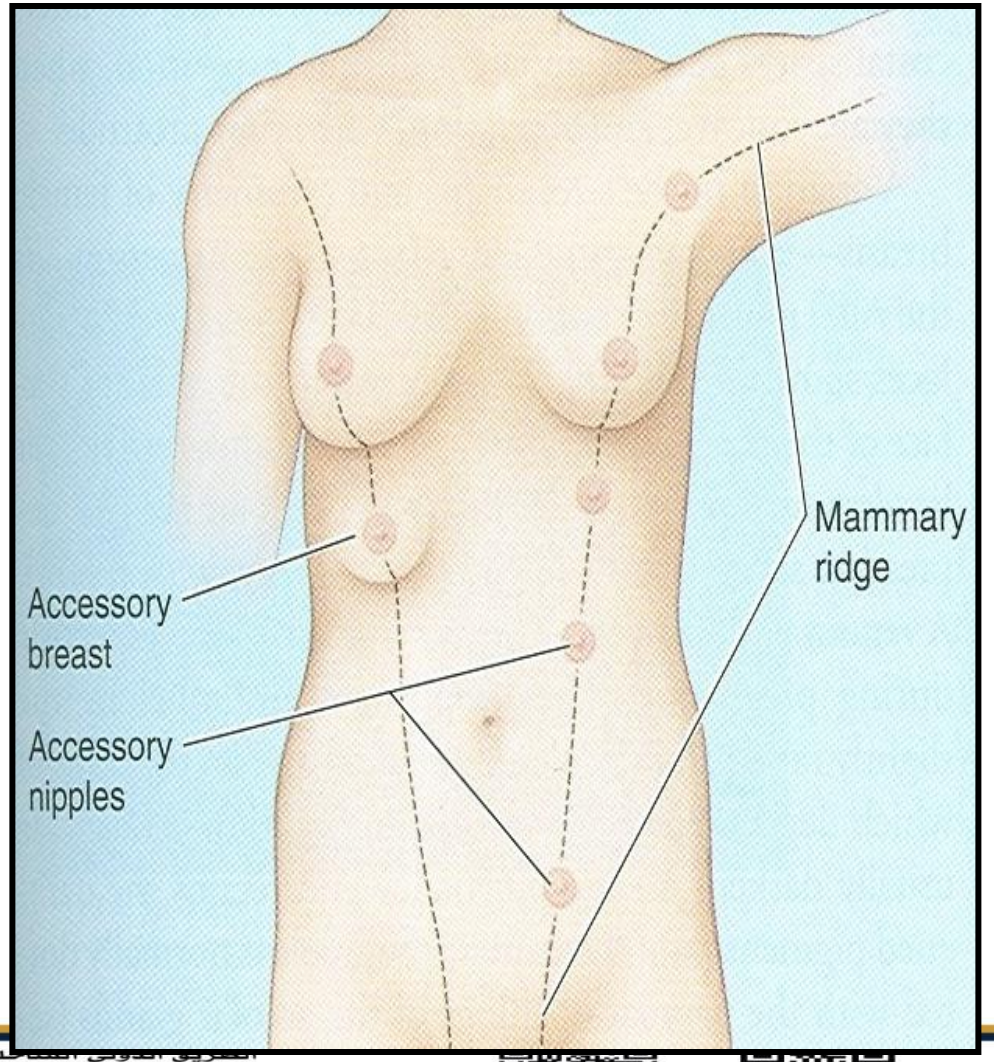
Mammary ridge

Mammary ridge extends from the axilla to the inguinal region.

In human, the ridge disappears **EXCEPT** for a small part in the **pectoral region**.

In animals, several mammary glands are **formed along this ridge.**

Canalization results in formation of **alveoli** and **lactiferous ducts**.

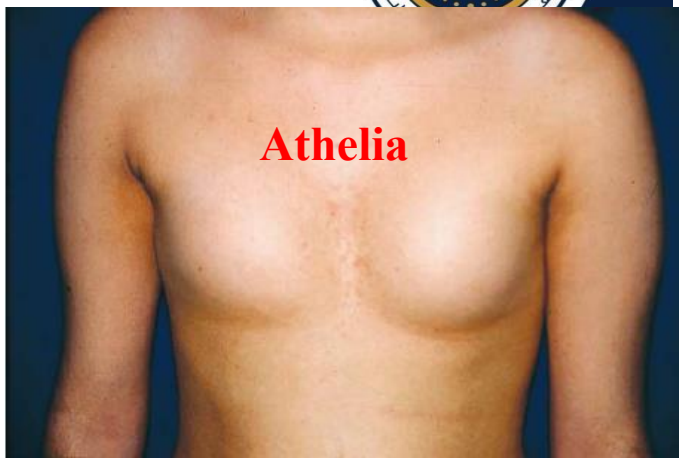


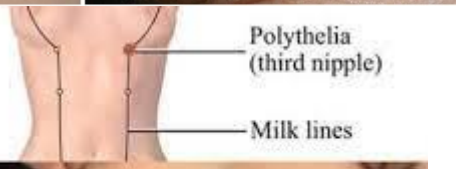
Congenital Anomalies

SAQ

I-Anomalies of the Nipple

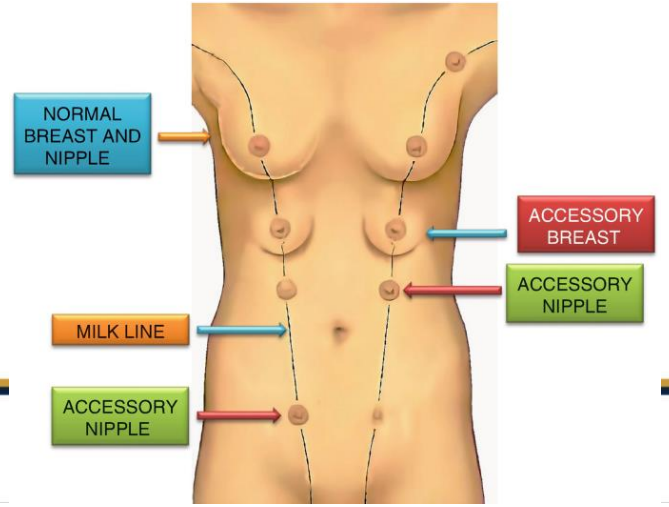
1. **Athelia**: • Congenital absence of the nipple (rare).
2. **Polythelia**: • Multiple nipples that may occur anywhere along the mammary line extending from the anterior axillary fold to the inguinal region, due to persistence of milk line cells. • They may be mistaken for moles or warts.
3. **Retraction of the Nipple**: • It is present since birth & should be differentiated later from nipple retraction due to breast cancer or chronic inflammation. • It is treated by massage, stretching, or surgery





II. Anomalies of the Breast

1. **Amazia (Breast hypoplasia):** Absence of the breast (usually unilateral). May be associated with absence of the sternal part of the pectoralis major muscle.
2. **Micromazia (micromastia):** A unilateral or bilateral small breast. Usually associated with congenital anomalies of the ovary.
3. **Polymazia (polymastia):** Multiple or accessory breasts due to persistence of the extramammary part of the milk line (very rare). Usually present (along the milk line) in the axilla, groin, thigh or vulva or, most commonly, on the chest wall. May function during lactation and may suffer from disease as the ordinary breast.



4. Ectopic breast: another breast present outside the milk line such as in axillary LNs.

5. Gynecomastia: Painless enlargement of the male breast (unilateral or bilateral) that may occur at puberty. Treatment: surgical excision.

6. Breast hypertrophy may occur early in infancy.

7. Gicantomazia (Gicantomastia = Massive or Diffuse Hypertrophy of the Breast: Due to abnormal sensitivity of the breast to estrogen. Usually occurs at puberty & rarely during the first pregnancy. Treatment: Reduction mammoplasty (i.e. reduction of the breast size).

Quiz 1

1. Which is <u>correct</u> regarding the mammary gland ?

A. It extends from the 2nd to 8th ribs.

B. Its base lies on the pectoralis major muscle.

C. It has 4-8 lactiferous ducts.

D. Its most lymph drains into the parasternal lymph nodes.

Quiz 2

2. The lymphatics from upper part of mammary gland drain into :

A. The parasternal lymph nodes.
B. Subdiaphragmatic lymph nodes.
C. Apical group of axillary lymph nodes.
D. Pectoral group of axillary lymph nodes.

Quiz 3

3. **The lactiferous ducts of mammary gland are :**

A. Less than 10.

B. From 10-15.

C. From 15-20.

D. More than 20.

Quiz 1

Which of the following describes the anatomy of the ovarian vessels?

A. Right ovarian artery arises from the right renal artery.
B. Right ovarian vein drains into the inferior vena cava.
C. Left ovarian artery arises from the left internal iliac artery.
D. Left ovarian vein drains into the vena cava.
E. Right ovarian artery arises from right internal iliac artery.

Quiz 3

The normal position of the uterus:

A. Anteversion and anteflexion.

B. Anteversion and retroflexion.

C. Retroversion and retroflexion.

D. Retroversion and antiflexion.

E. Retroflexion.

Quiz 2

The uterine tubes, uterus, cervix, and superior part (1/3) of the vagina all arise from:

A) The Wolffian ducts
B) The paramosonepheric ducts
C) The mesonephric ducts
D) The allantois
E) The ureteric bud

Quiz 2

2. Inferior vesical artery

A. Is a branch of external iliac artery

B. Supply the urinary bladder of male & female

C. Gives superior vesical arteries

D. Is a branch of internal iliac artery

The answer: D

Quiz

Uterus didelphys is characterized by:

A. double uterus, double cervix and double vagina

B. double uterus, double cervix and single vagina

C. double uterus, single cervix and single vagina

D. Duplication of the upper part of the body of the uterus

E. The fundus of the uterus is depressed in its middle part

Quiz 1

The epididymis, Vas deferens, ejaculatory duct, and seminal vesicle all arise from:

A) The Mullarian ducts
b) The paramosonepheric ducts
c) The mesonephric ducts
d) Leydig hormones
e) Wolffian hormones

SAQ

Describe structures of the spermatic cord:

1. Vas (ductus) deferens
2. Testicular artery
3. Testicular vein (pampiniform plexus)
4. Testicular nerve (autonomic)
5. Testicular lymph vessels
6. Remains of processus vaginalis

SAQ

Summerize covering of the testis:

1. Skin of the scrotum.
2. Dartos muscle.
3. Colle's fascia.
4. External spermatic fascia.
5. Cremasteric muscle & fascia.
6. Internal spermatic fascia.
7. Tunica vaginalis: 2 layers (parietal & visceral layers).
8. Tunica albuginea (fibrous capsule).
9. Tunica vasculosa.

SAQ

List Structures that open in the vestibule of the vagina

A. Urethra
B. The Bartholin glands & paraurethral ducts.
C. The vagina.

SAQ

Summarize parietal branches of posterior division of internal iliac artery

1.Iliolumber artery.
2.Lateral sacral artery.
3.Superior gluteal artery. (continuation)

SAQ

Describe development of external genitalia in male

1. **The genital tubercle:** undergoes growth and elongation to form the **penis**.
2. **The urogenital folds:** fuse to enclose the **spongy urethra**.

The labioscrotal folds: fuse at the midline to form the **scrotum**.

SAQ

Mention the components of Breast bed

Retro-mammary space: - Makes the breast movable over pectoralis major muscle.
Pectoral fascia [deep fascia]: covers pectoralis major.
Muscular bed:-

i. **Pectoralis major: supero-lateral ⅔** of breast lies on it.
ii. **Serratus anterior. Infro-lateral part**
iii. **External oblique aponeurosis:- lower ⅓** of breast lies on them


الحمد لله
Thank You
Thank You