



WITH NOTES

FEMALE REPRODUCTIVE ORGANS

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M N U



Intended Learning Outcomes (ILOs)

At the end of the lecture, the students should be able to:

1. Describe Arrangement of the pelvic viscera
2. Knew the gross anatomy of female external genitalia
3. Describe the gross anatomy of female internal genital organs

Agenda

1. Arrangement of the pelvic viscera
2. Anatomy of female external genitalia
3. Anatomy of female internal genital organs

* نخلي بالننا في المحاضرة دي نركز على ال **ligaments, Blood supply & Lymphatic drainage**



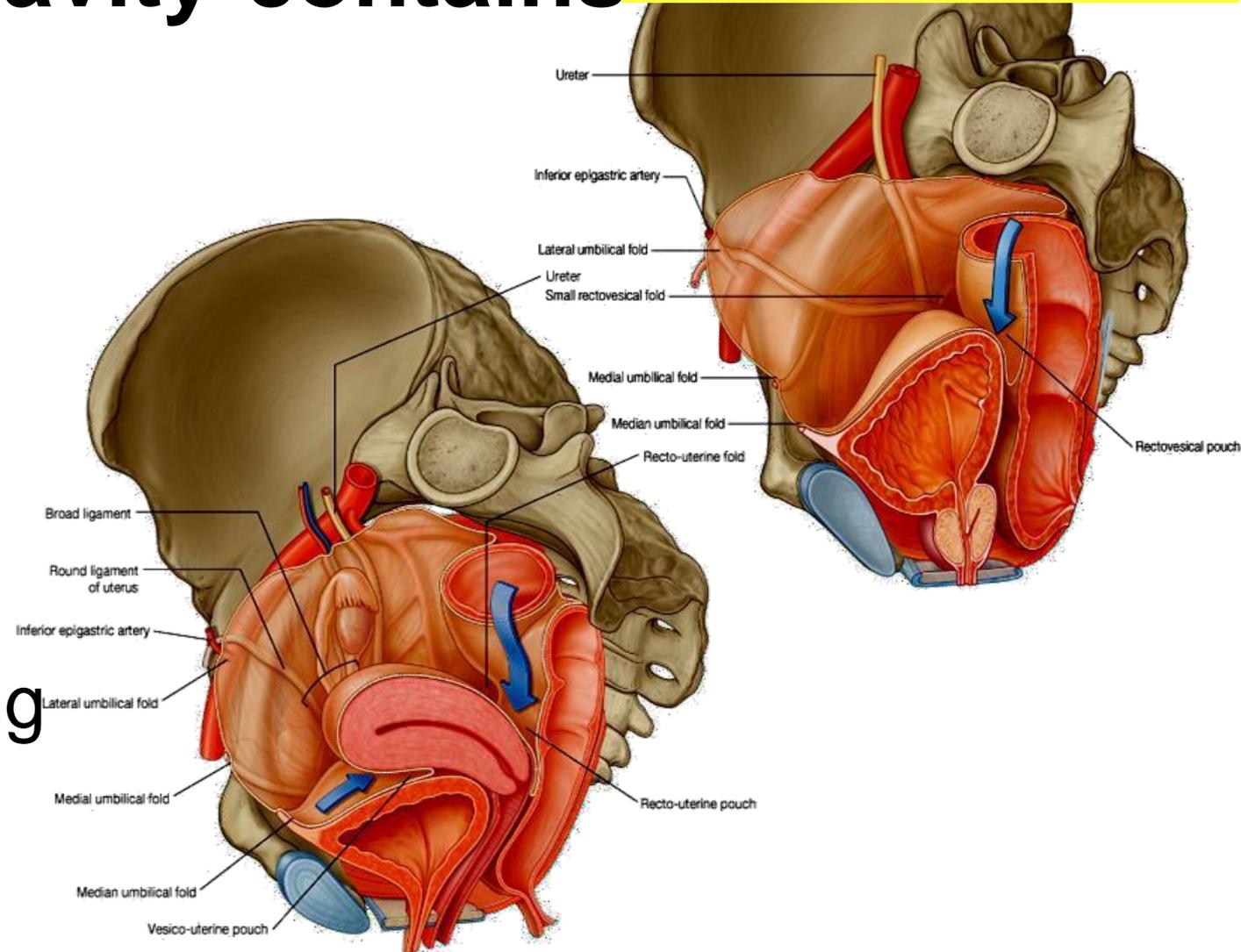
Nice to know

Arrangement of the pelvic viscera

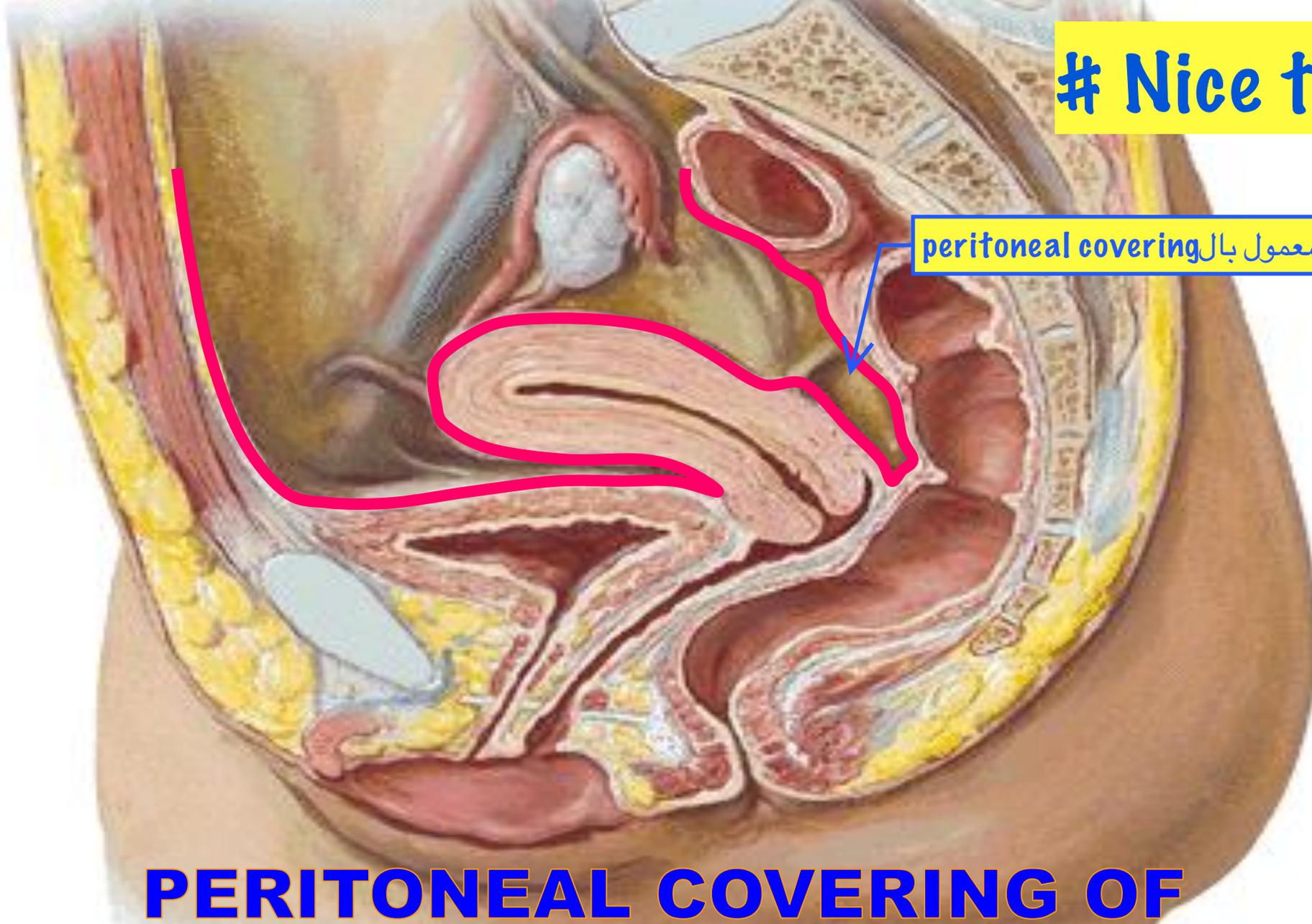
The pelvic cavity contains

Nice to know

1. The sigmoid colon and rectum (**posteriorly**).
2. The urinary bladder (and prostate in males) (**anteriorly**).
3. The uterus with its broad ligaments (in females) (having an **intermediate** position).



Nice to know



peritoneal covering
pouch المعمول بال

PERITONEAL COVERING OF FEMALE PELVIC ORGANS

Nice to know

1. recto-uterine pouch (Douglas pouch).

OSPE

Recto-uterine pouch

pelvic abscess

Vesico-uterine pouch

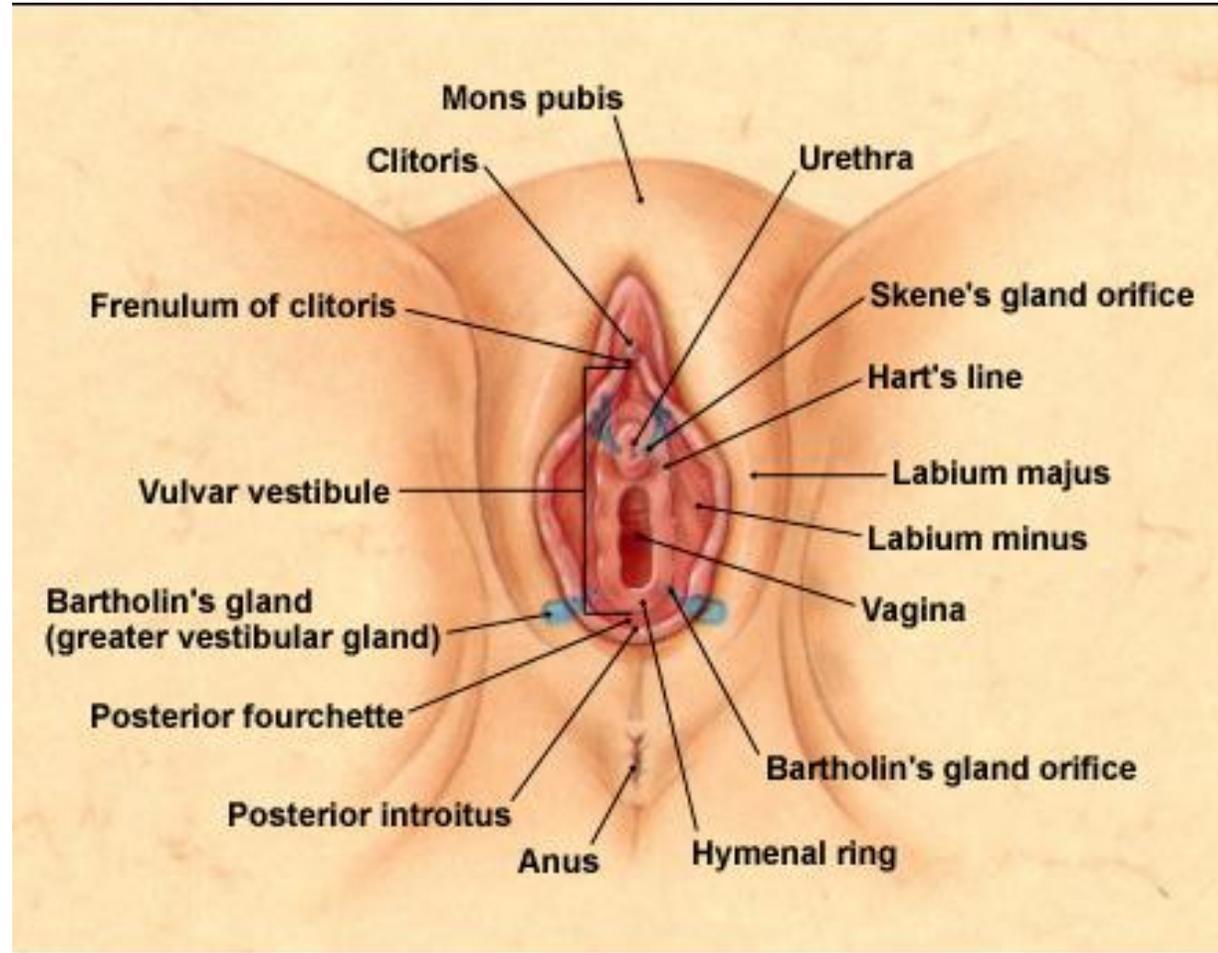
2. uterovesical pouch.

PERITONEAL FEMALE POUCHES



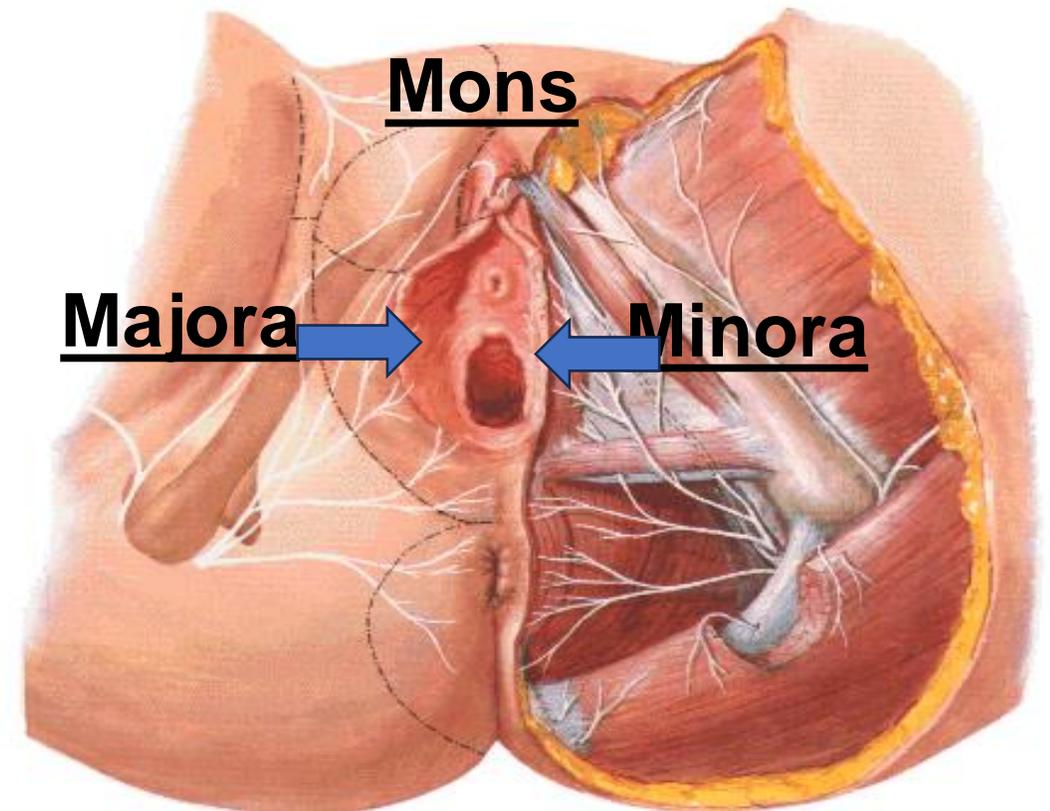
Female External Genitalia

THE VULVA



THE VULVA

1. **Mons pubis:** a pad of fat overlying the symphysis pubis and covered by skin & hairs.
2. **Labia Majora:** Outer 2 skin folds, raised by underlying fat, and is covered by hairs while the inner medial surface is smooth, hairless and contains sebaceous and sweat glands.
3. **Labia Minora:** 2 thin folds of modified skin situated medial to the labia majora.

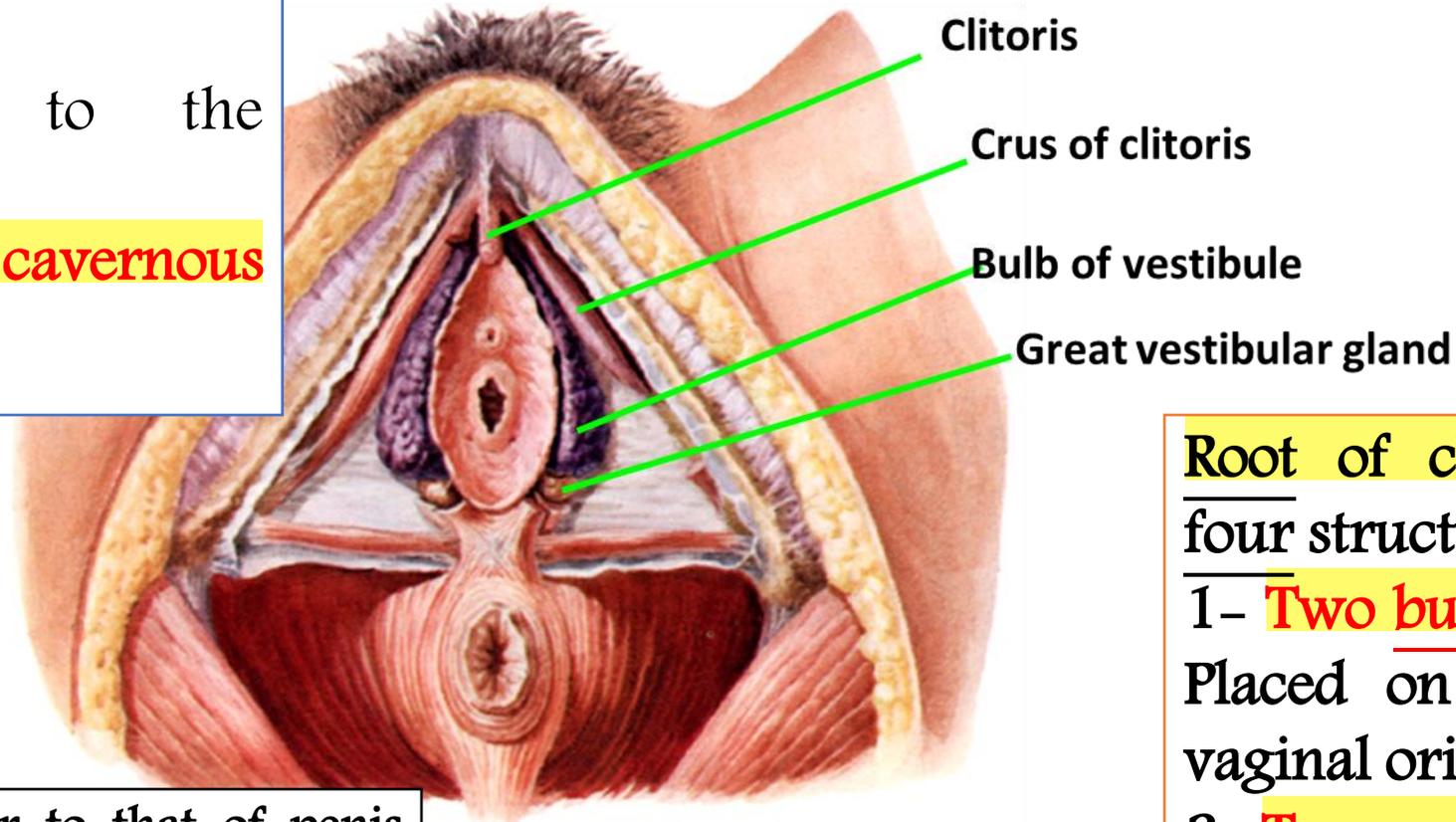


Female External Genitalia # Nice to know

THE VULVA

Clitoris:

- Corresponds to the **penis** in male
- an **erectile cavernous** structure



Root of clitoris: Consists of four structures:

- 1- **Two bulbs** of the vestibule. Placed on each side of the vaginal orifice.
- 2- **Two crura** of clitoris.

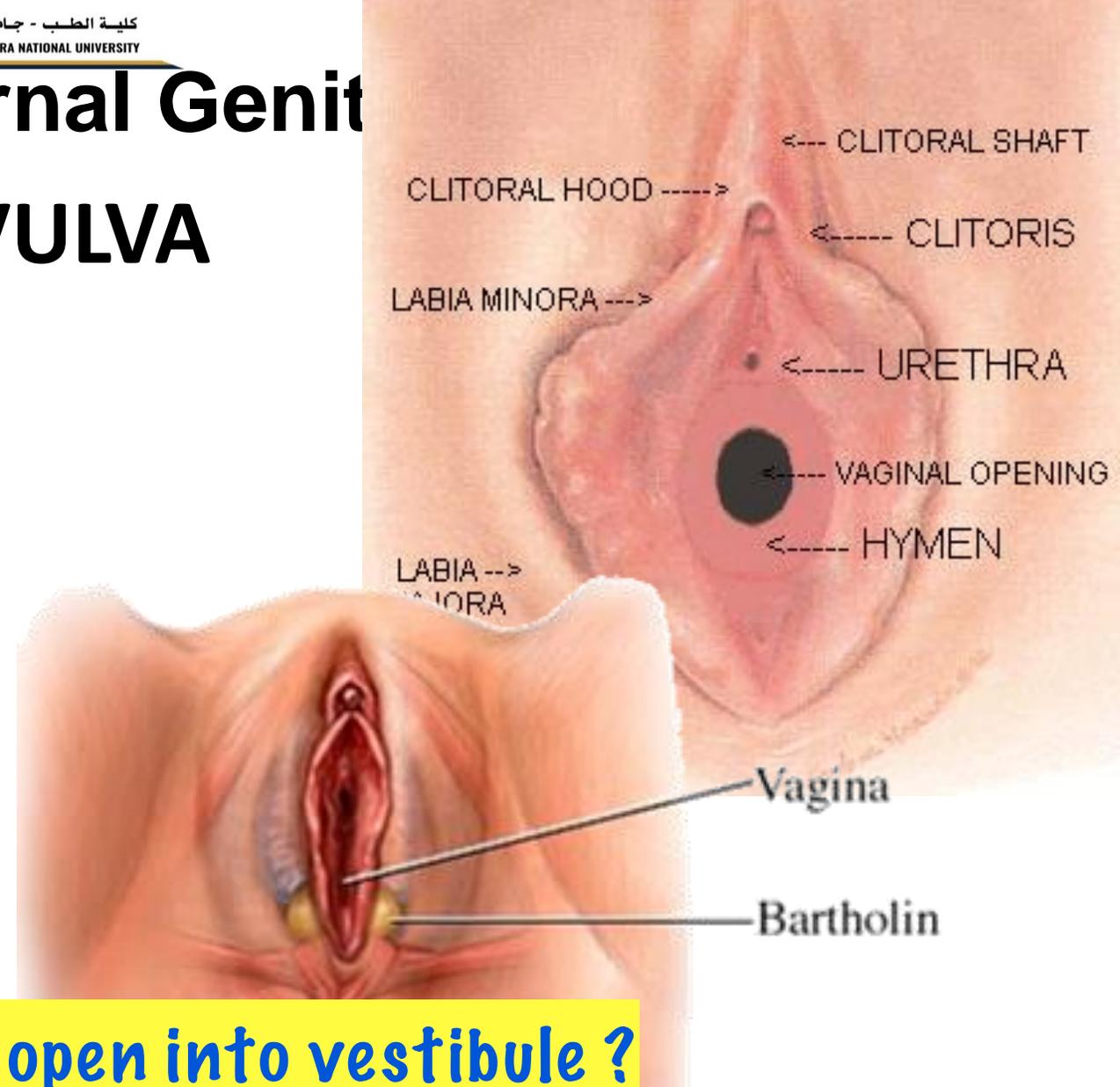
Body of clitoris: similar to that of penis
Except: Smaller in size. Not traversed by urethra.

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.



SAQ : List three structures that open into vestibule ?

السؤال دا جه لحورس السنة اللي فاتت



THE VULVA

Blood Supply

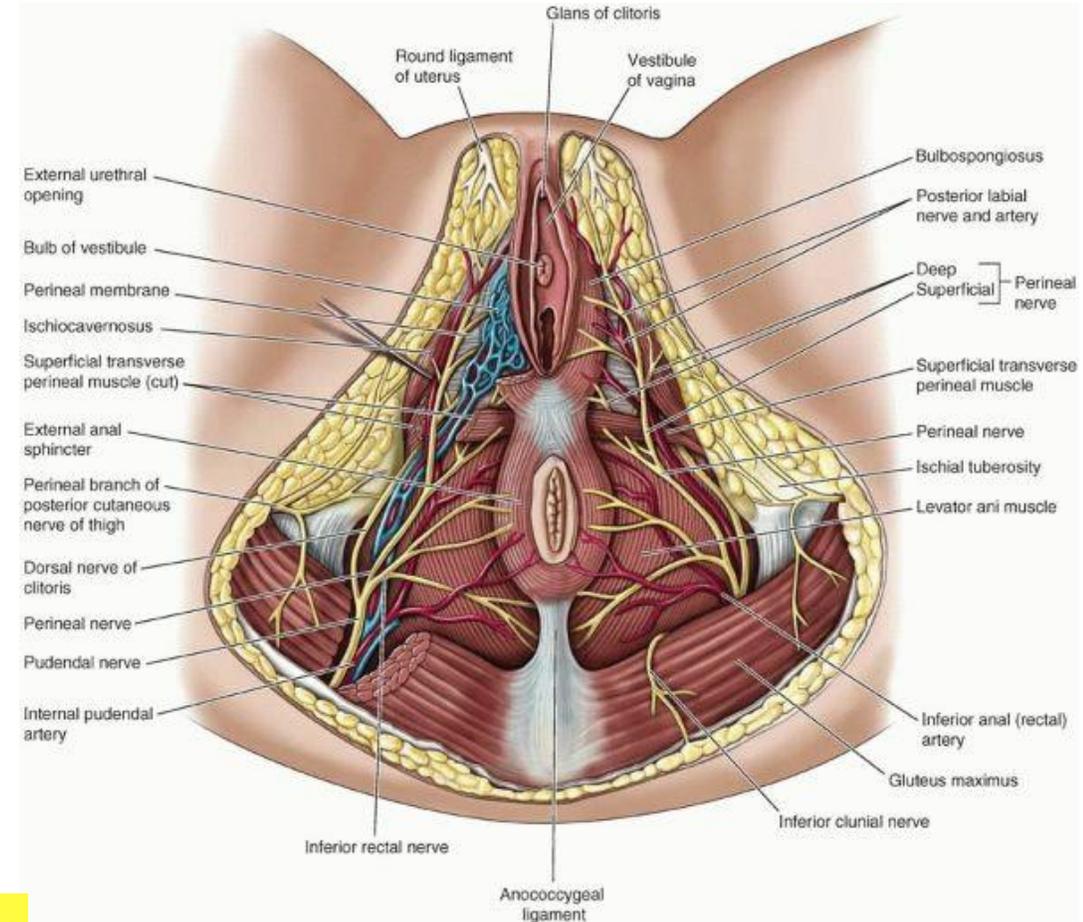
Arterial Supply:

- External & Internal pudendal arteries.
- Anterior division of internal iliac give deep & dorsal artery of the clitoris.

MCQ

Venous Drainage:

- The veins draining the vulva form a venous plexus from which veins accompany their corresponding arteries.
- The veins draining the clitoris join vaginal and vesical venous plexuses.

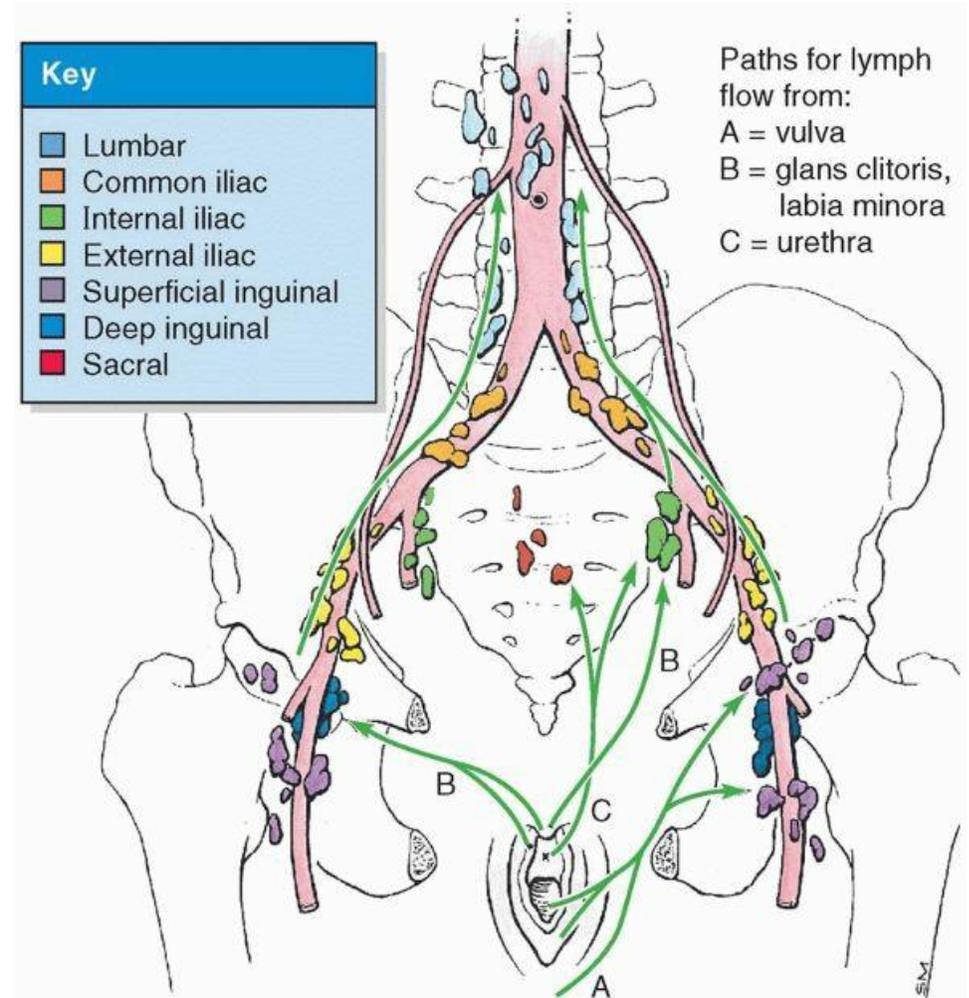


MCQ : Vulva is supplied by which artery ?

THE VULVA

Lymphatic Drainage of the vulva

From the skin and appendages, to the superficial inguinal lymph nodes, to the deep inguinal and femoral lymph nodes of which the lymph node of Cloquet drains the clitoris directly.



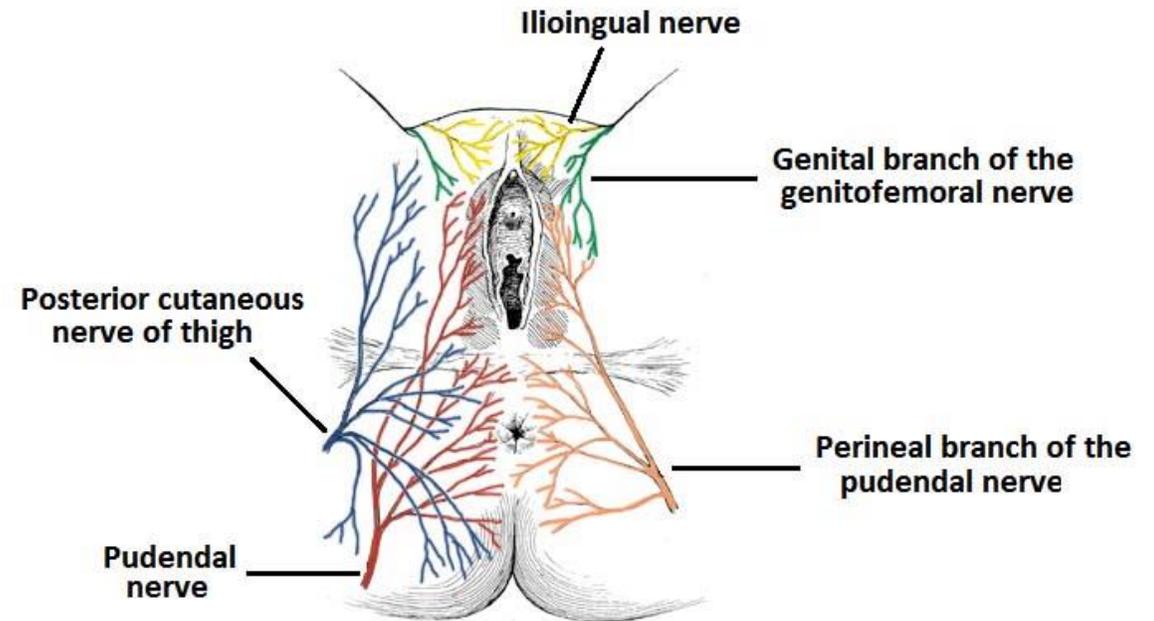
MCQ : Case of diabetic patient (lymph node involved) ?

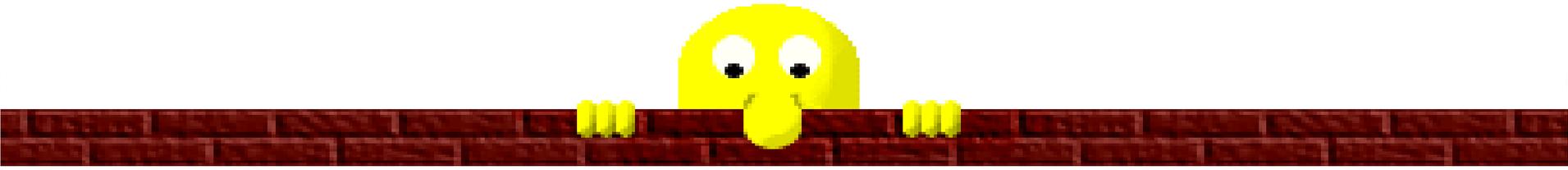


THE VULVA

Nerve Supply of the vulva

- The vulva is supplied mainly from the **pudendal nerve** (S 2, 3 & 4).
- Additional sensory nerves are supplied from the **Ilio-inguinal nerve** (L1), the genital branch of **genito-femoral nerve** (L 1,2) and the **posterior cutaneous nerve of the thigh**.





Female internal Genitalia

The Ovary

Features

Shape: **almond-shaped** has 2 ends, 2 borders & two surfaces

- **Uterine end:** attached to the **uterus** by **ovarian ligament**
- **Tubal end:** related to the **fimbria** of the **uterine tube**
- **Anterior border:** gives attachment to the **mesovarium**.
- **Posterior border:** directed backwards

MCQ مهم : Ovarian ligment connect the uterus with which end of ovary ? Uterine end
MCQ مهم : Anterior border give attachment to: mesovarium



The Ovary

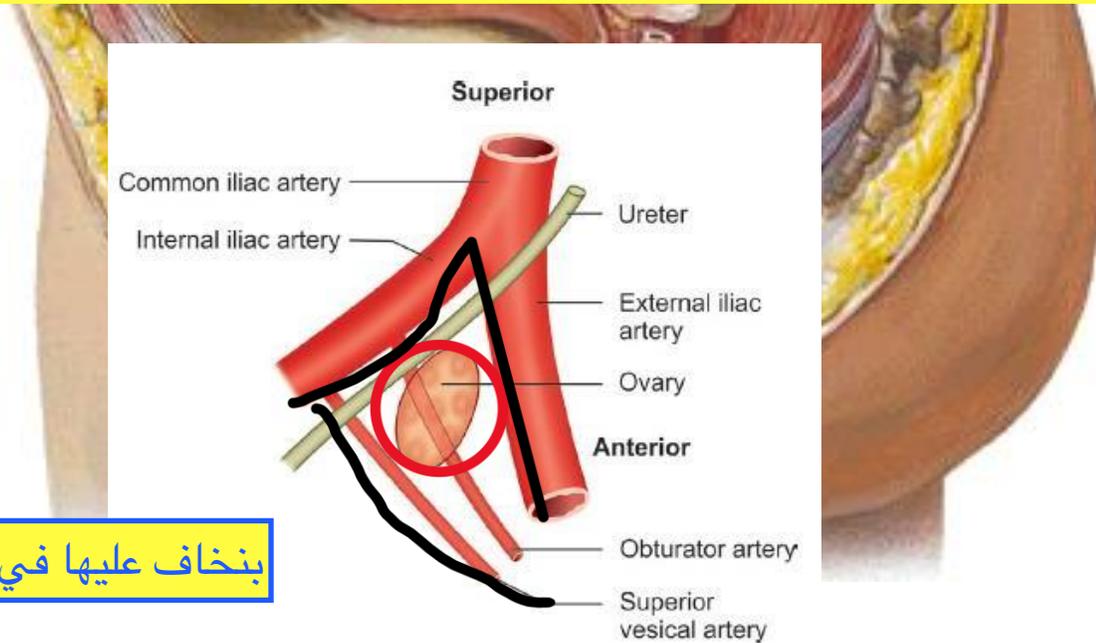
Site: The position of the ovary is variable but commonly lie against the lateral wall of the true pelvis in a depression called the **ovarian fossa**.

SAQ : Describe the anatomical boundaries of the ovarian fossa ?
MCQ : Ovarien fossa is bounded by : **Ureter**

The ovarian fossa is bounded by:

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

بنخاف عليها في العمليات



The Ovary

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

A. Peritoneal ligaments:

جزء من ال Broad ligment و main support

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:

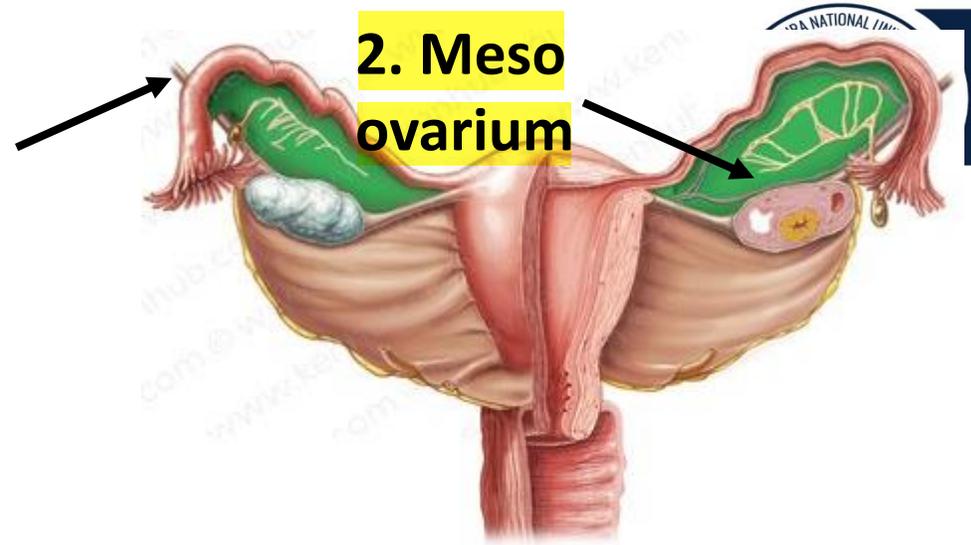
الدكتور قال نكتب جميعها (Descend of the ovary) Embryonic ligament

MCQ

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

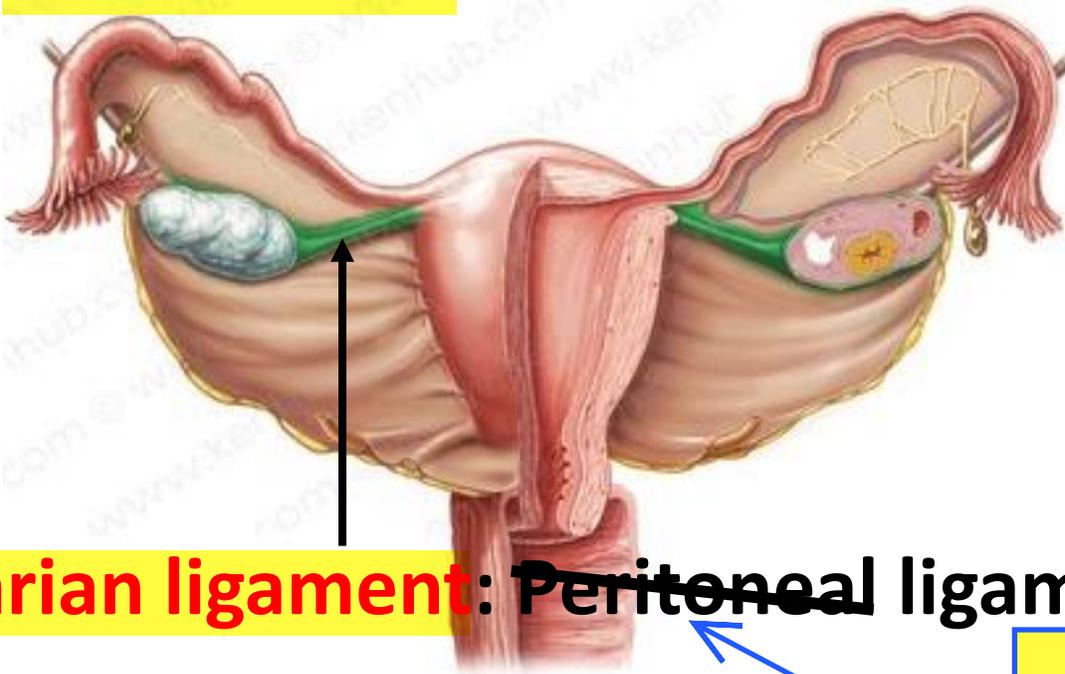
1. Suspensory ligament

2. Meso ovarium



• Peritoneal ligament:

1. Suspensory ligament
2. Meso ovarium.



Suspensory ligament of ovary

• Ovarian ligament: Peritoneal ligament:

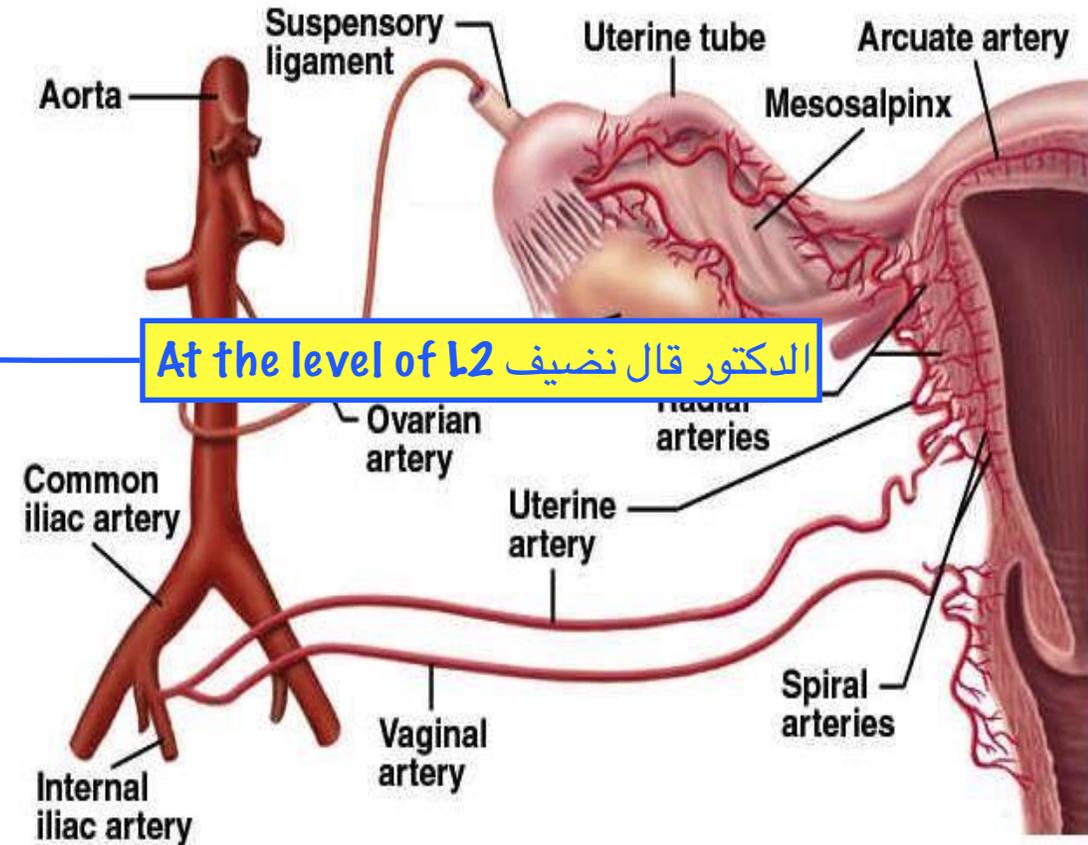
تعديل : Non-peritoneal ligment
ونضيف بعد النقطتين (Descend the ovary) Embryonic ligment

The Ovary

Blood supply

Arterial supply:

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



الدكتور قال نضيف L2

The Ovary

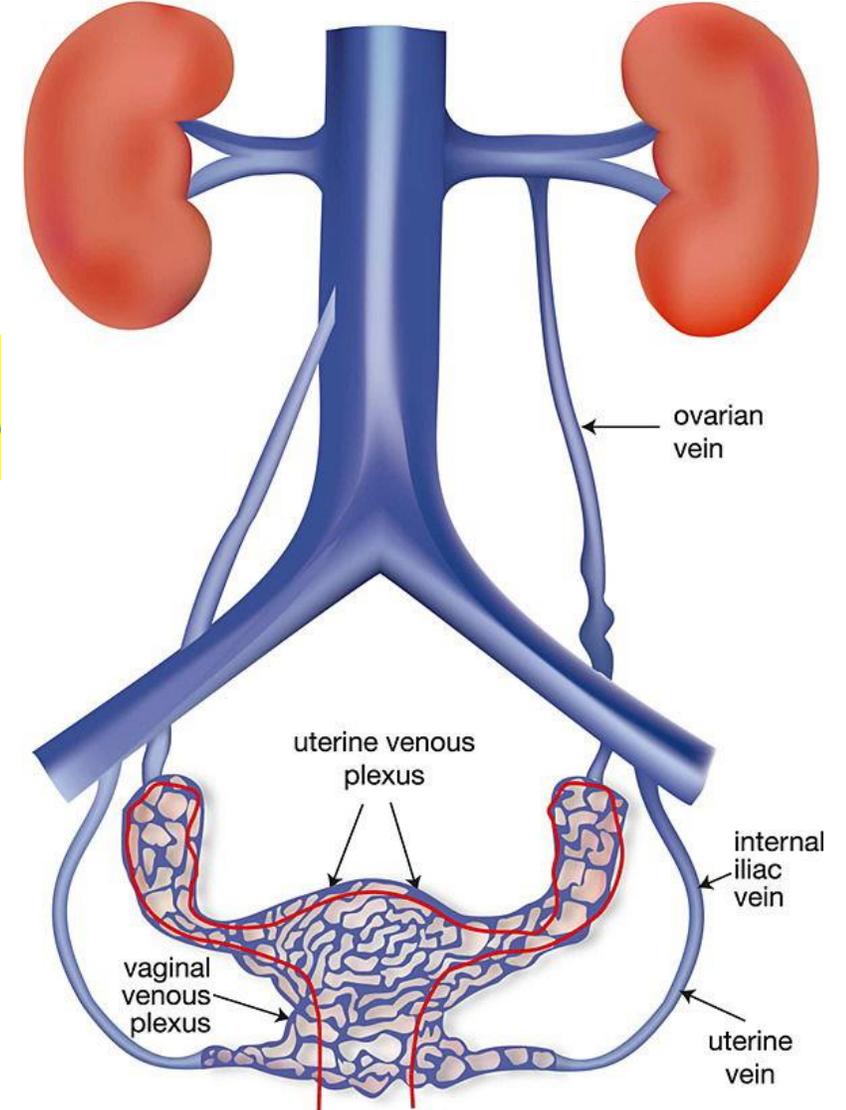
Blood supply

Venous drainage:

مهمة جدا!!!

The right one in I.V.C.

The left one in left renal vein.



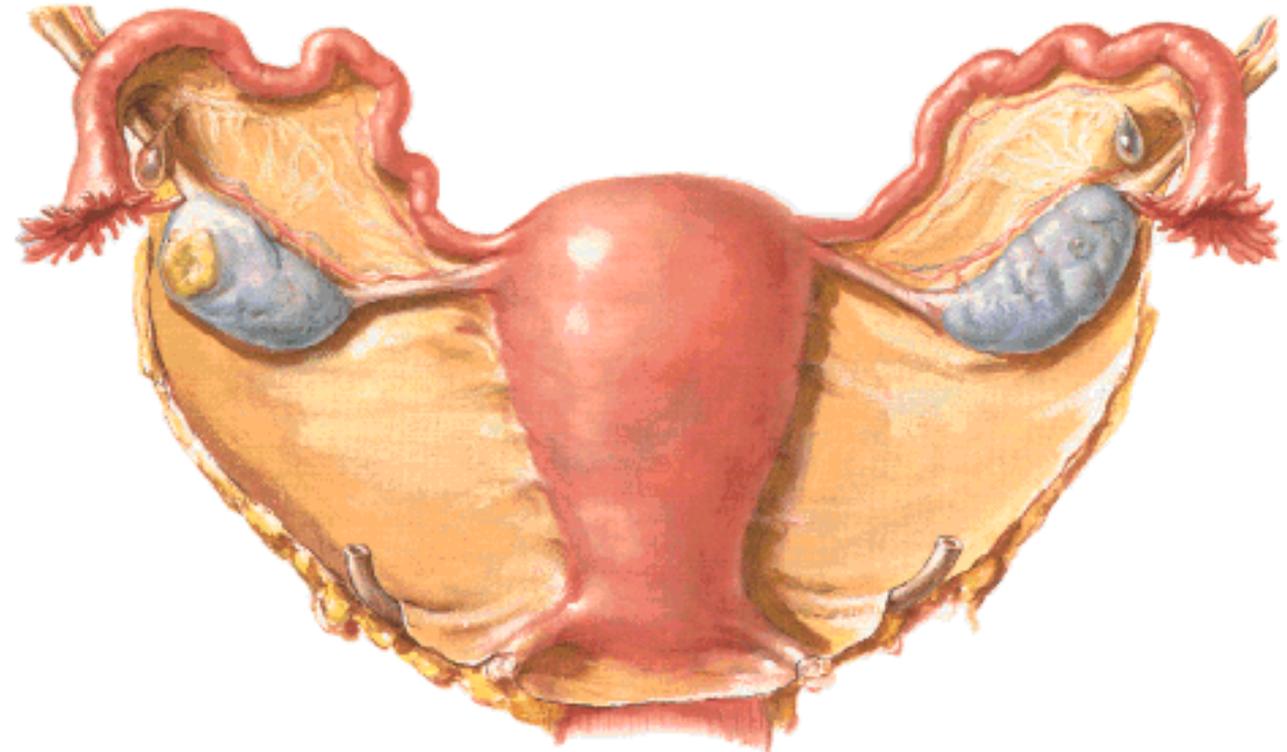
The Uterine tube

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.

MCQ : Broad ligment enclos which part of fallopian tube : Medial 4/5



PARTS of fallopian tube



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



Ampulla: Tube widens to form the **(5 cm)** Longest part fertilisation

مسؤول عن ال



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



Intramural (uterine) part:

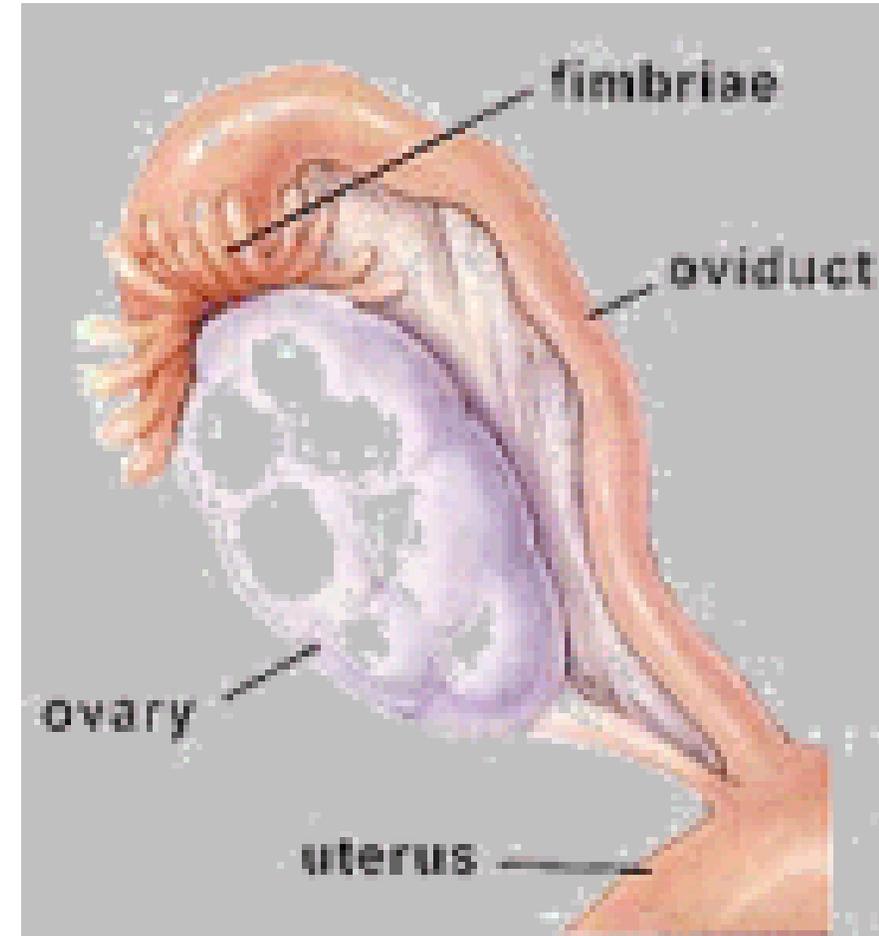
- It is the **shortest (1 cm)** and **narrowest part.**

SAQ مهم جدا : Describe parts of fallopian tube ?

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

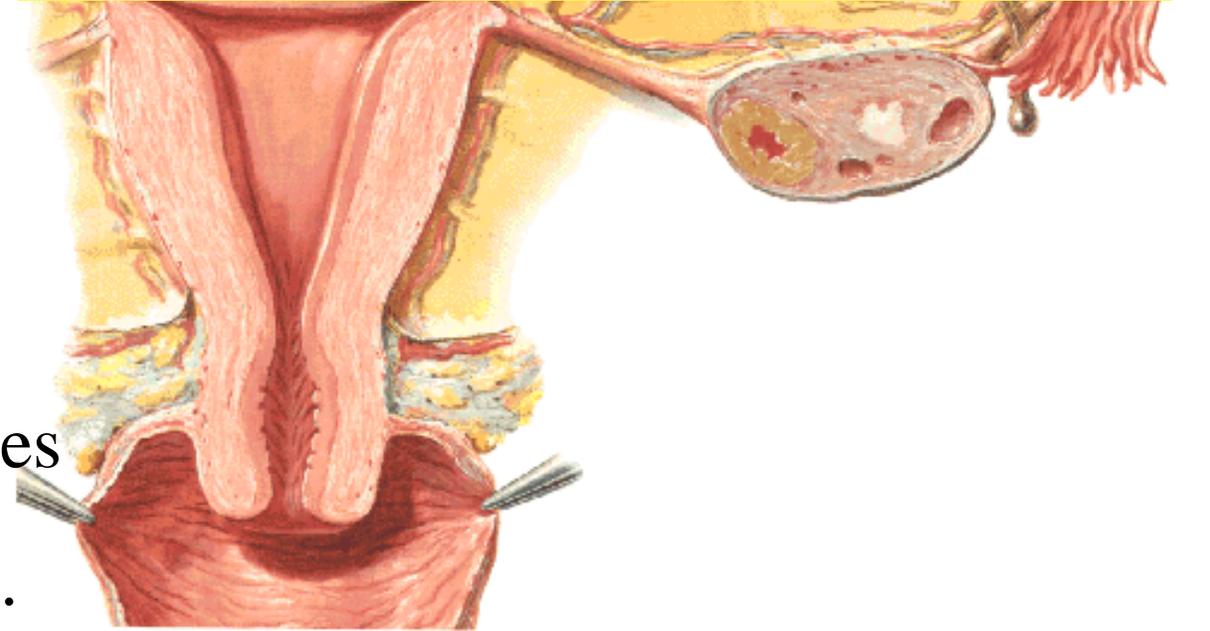
Arterial supply:

- 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**.

MCQ : Principle (Main) blood supply of uterine tube is : Uterine artery



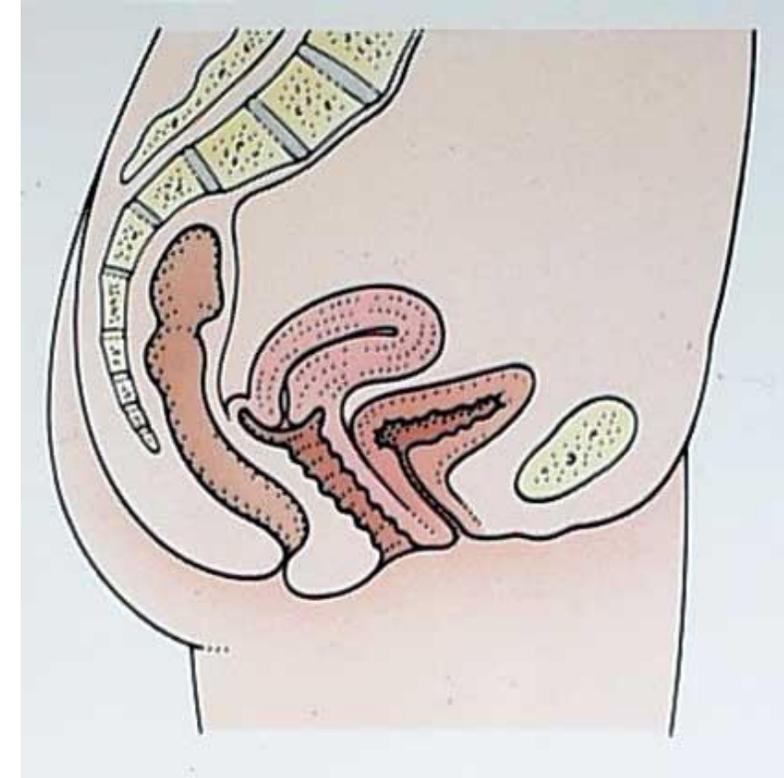
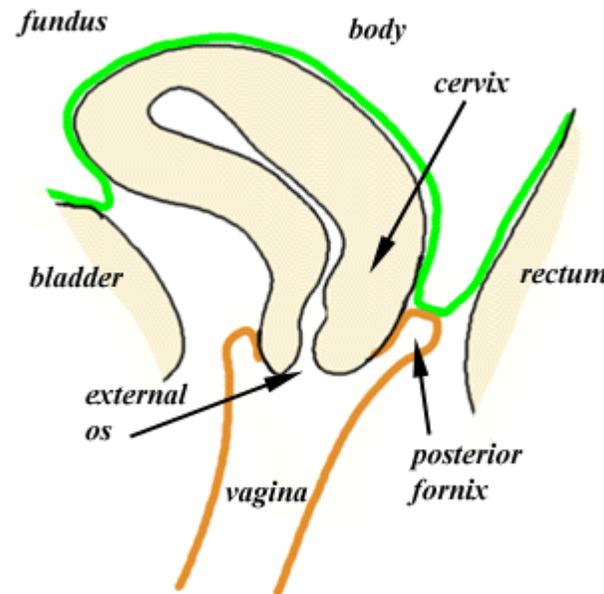
The Uterus

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

Size: of a woman's clenched fist.

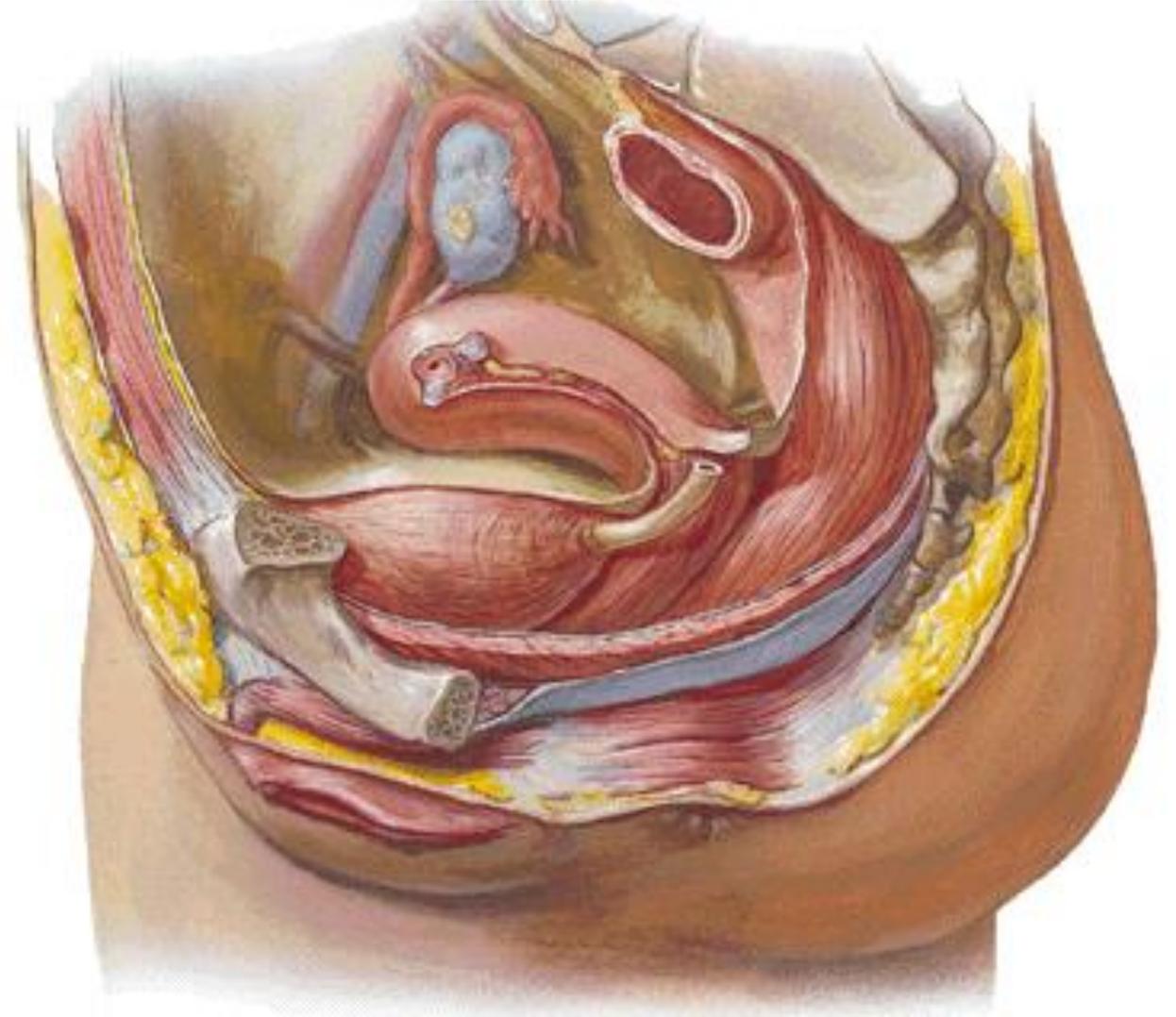
Parts: divided into the

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



SITE

in the true pelvis in
between urinary
bladder and rectum



Subdivision

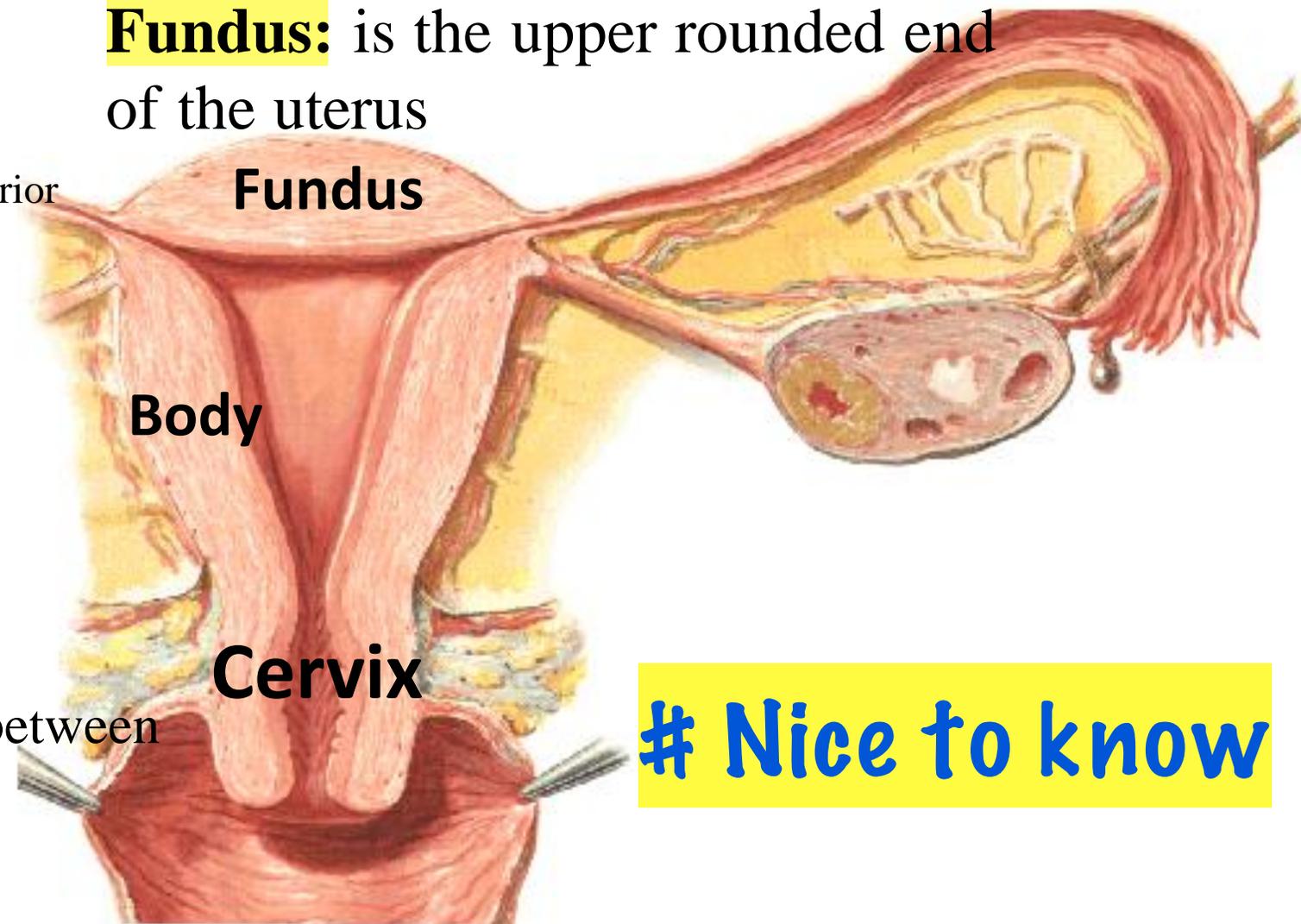
Body:

- 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.

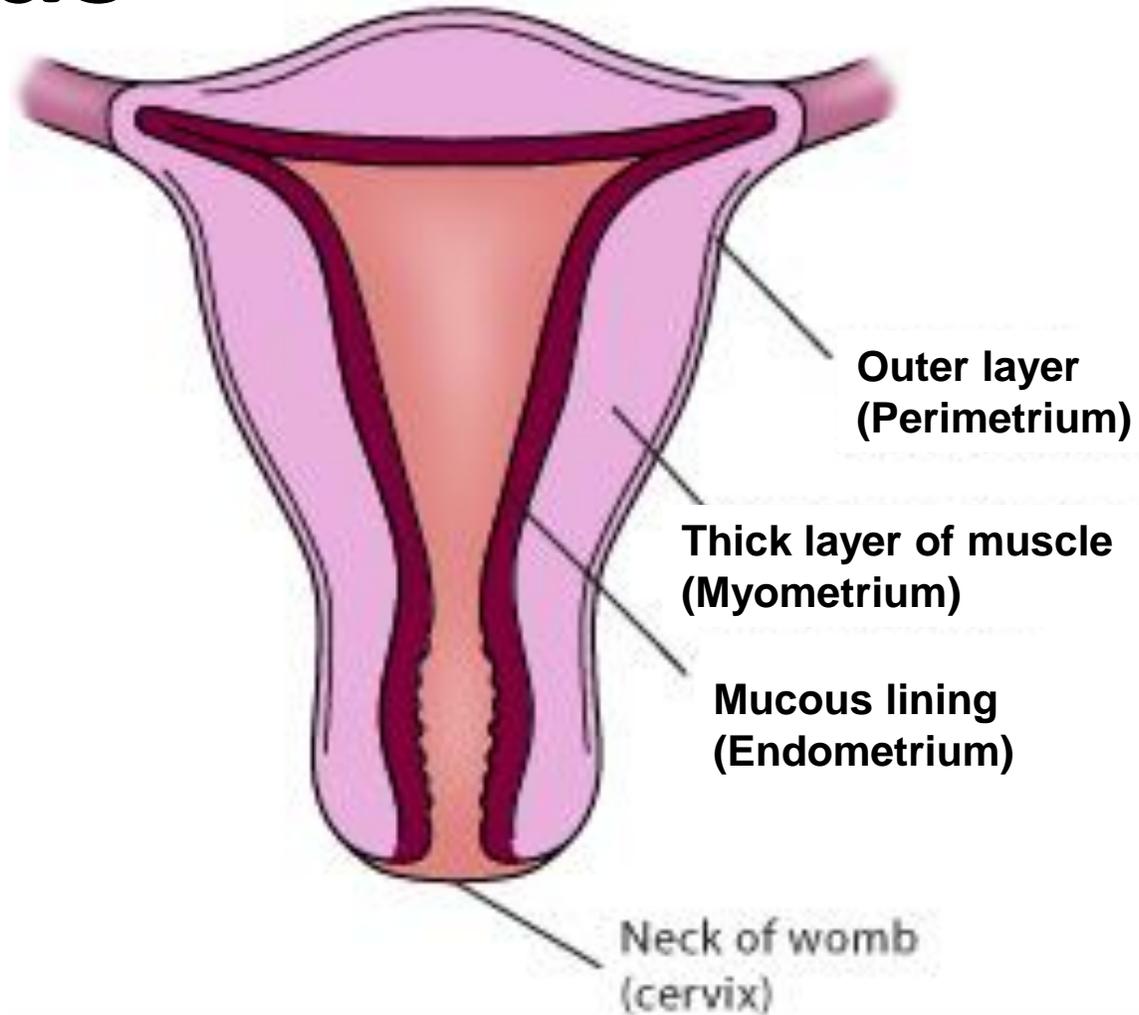
Fundus: is the upper rounded end of the uterus



Nice to know

Uterus

The uterus wall has 3 layers:
the outside layer called the **perimetrium**,
the muscular inside layer called the **myometrium**
the mucous membrane lining the uterus called the **endometrium**.



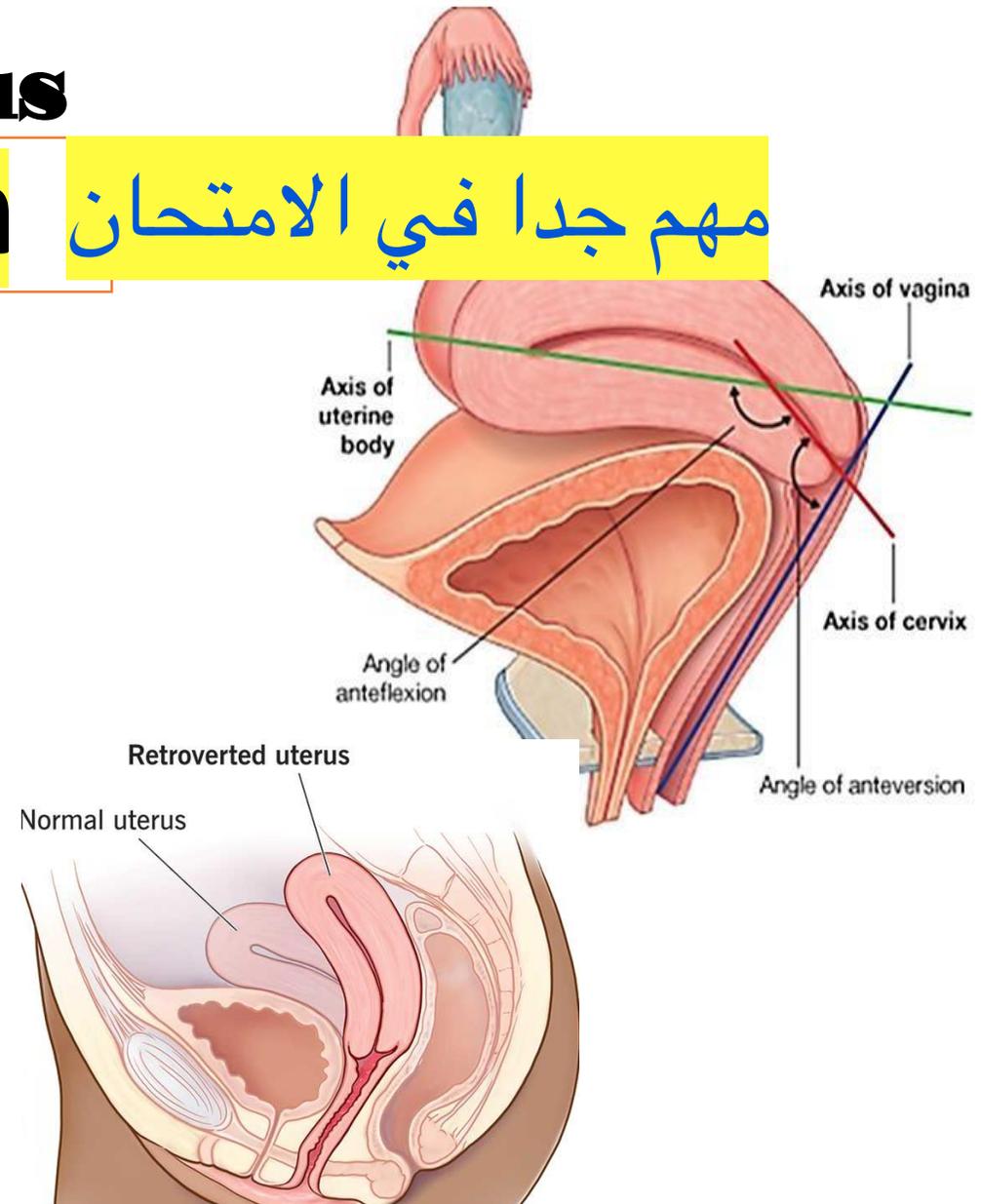
The Uterus

Position

مهم جدا في الامتحان

- The uterus is kept in an **anteverted anteflexed position (AVF)**.
- **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**.



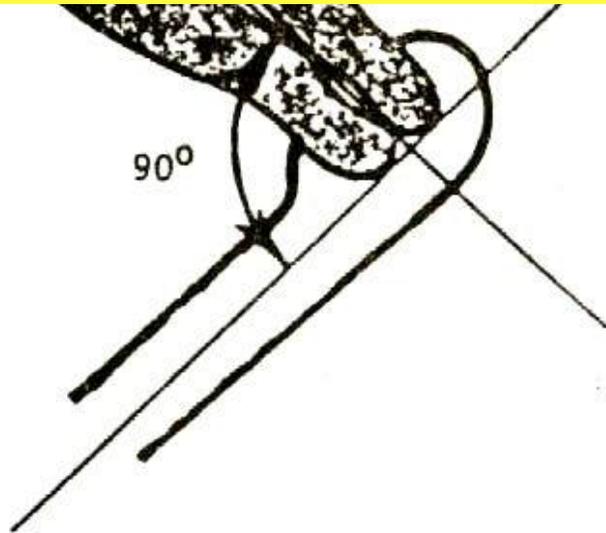
Position of uterus

SAQ : Describe position of uterus ?

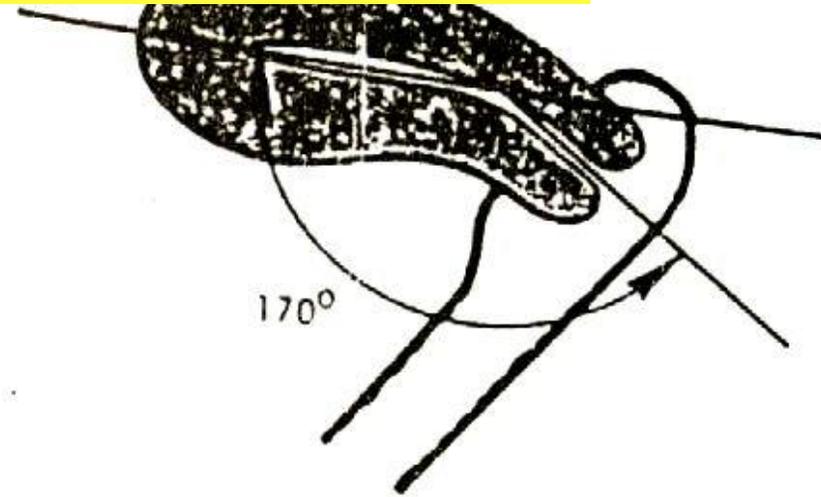
A) Uterus lie between rectum & urinary bladder,

Anteversio: "Uterus vs. vagina" (Right angle) &

Anteflexio: "Body of uterus vs. cervix" (Obtuse angle)

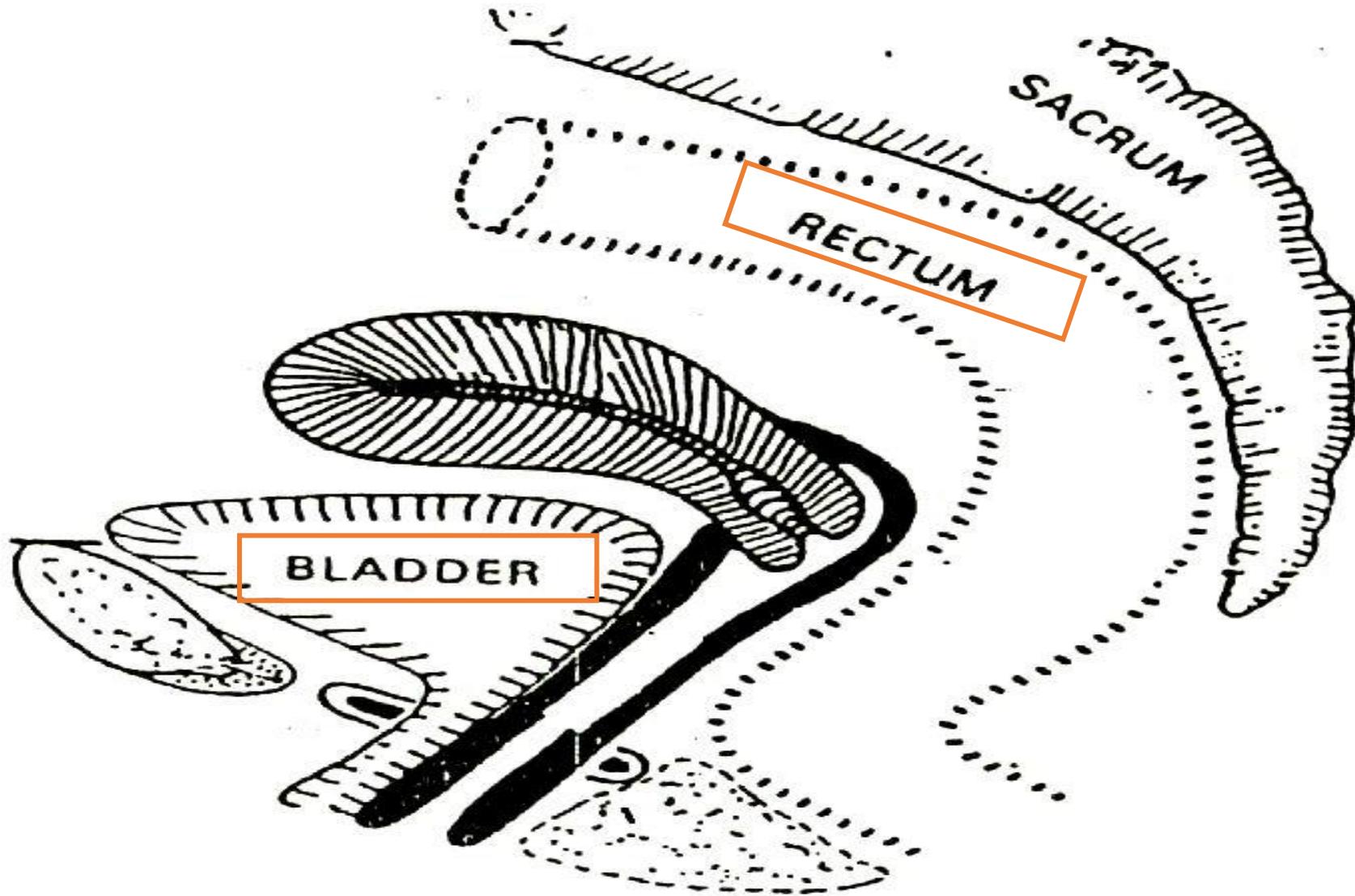


Anteverted position of uterus.



Anteverted and anteflexed position of uterus.

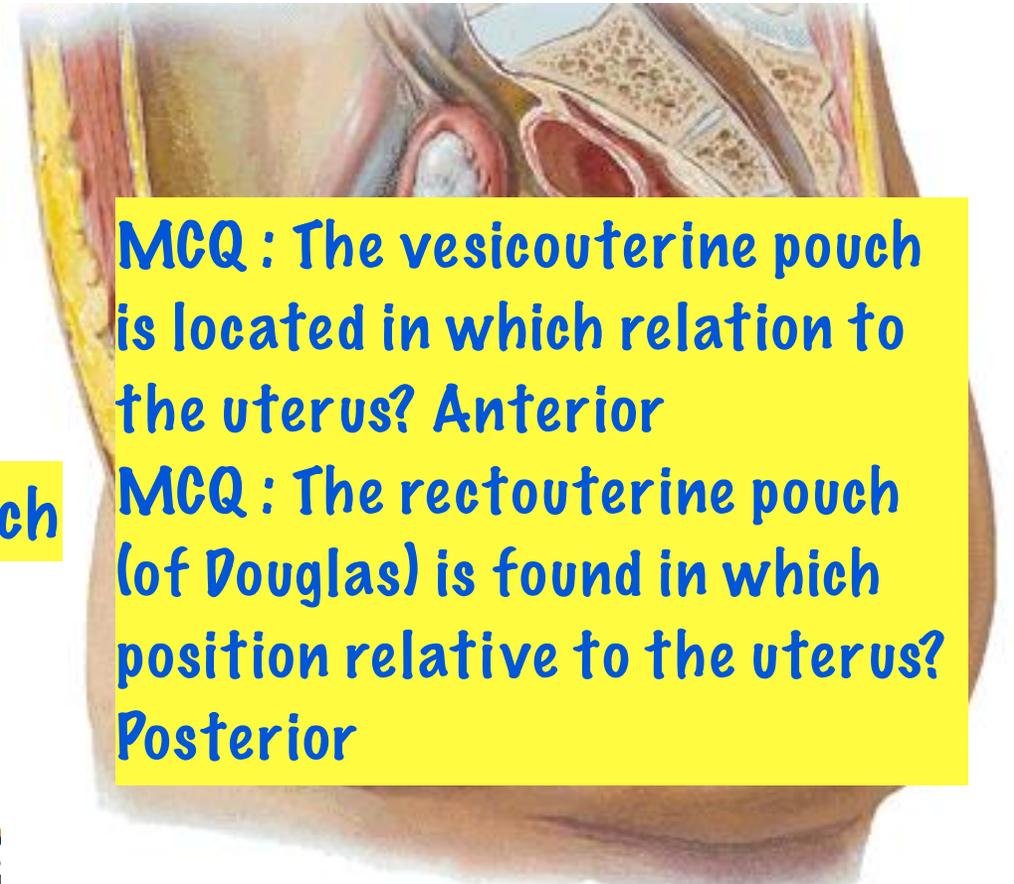
Surfaces of body

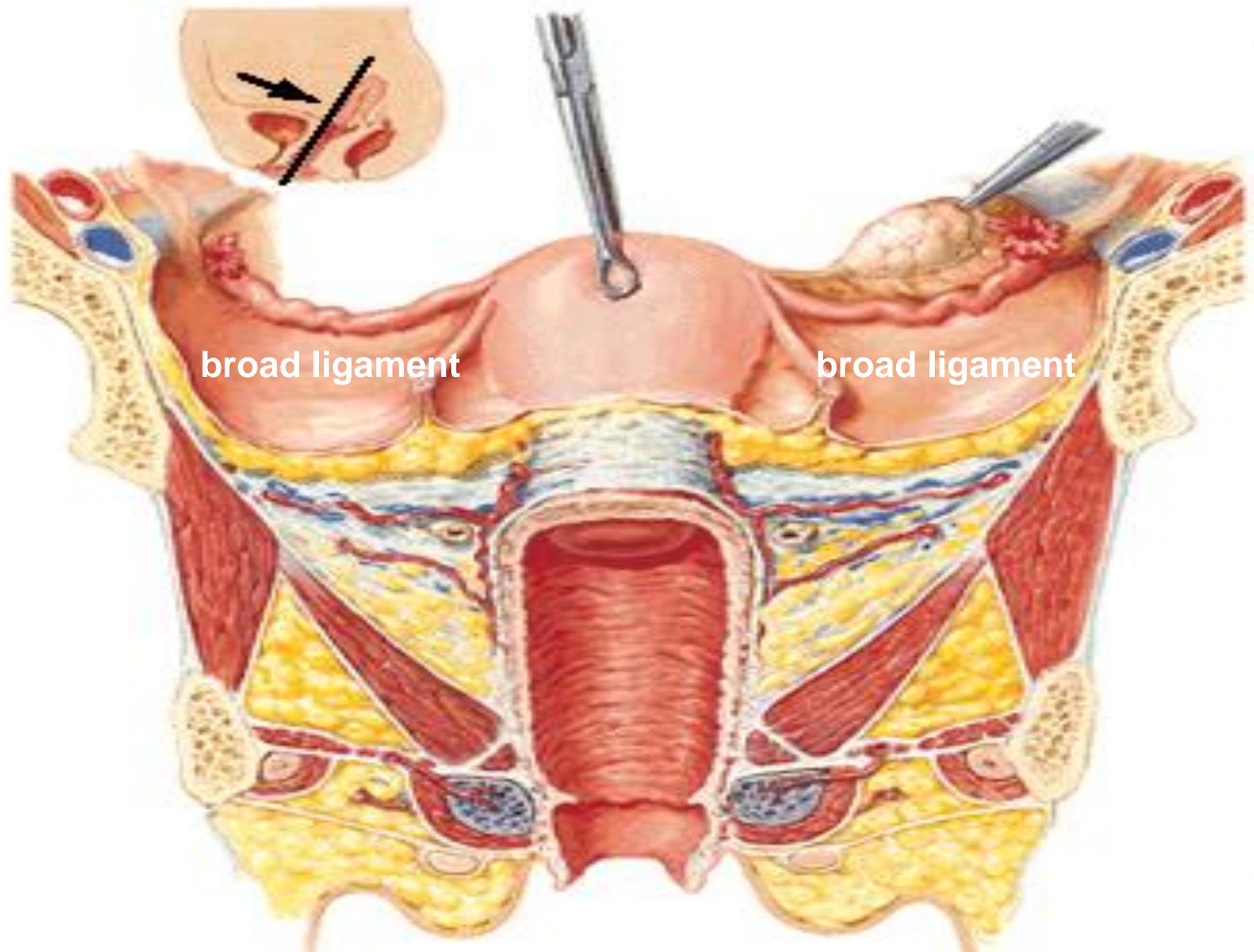


The Uterus

Relations of the Body of the Uterus

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





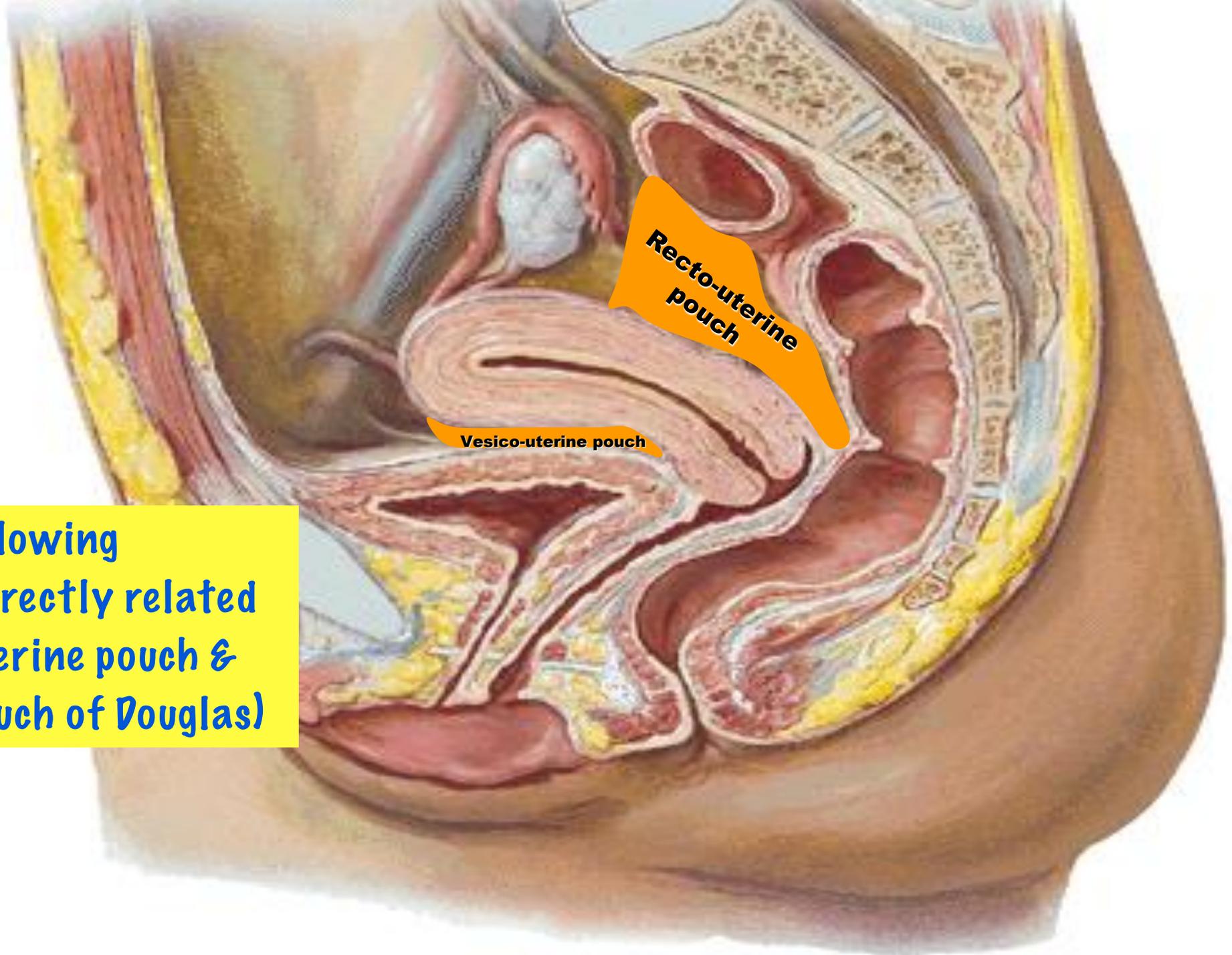
Peritoneal covering

- a. Fundus: completely covered with peritoneum.
- b. Body: covered anteriorly and posteriorly with peritoneum.
- The two layers of peritoneum meet together at lateral border as the broad ligament.
- c. Cervix: supravaginal portion:
 - Posteriorly:- covered with peritoneum
 - Anteriorly:- not covered with peritoneum and comes in contact with fundus of urinary bladder.

MCCQ : Which portion of the uterus is NOT covered by peritoneum ? Anterior surface of the supravaginal cervix

كافي تحفظوا دا في السلايد دي واعرفوا ان الباقي متغطي





Peritoneal pouches

MCQ : Which of the following peritoneal pouches is directly related to the uterus? Vesicouterine pouch & Rectouterine pouch (pouch of Douglas)

The Uterus

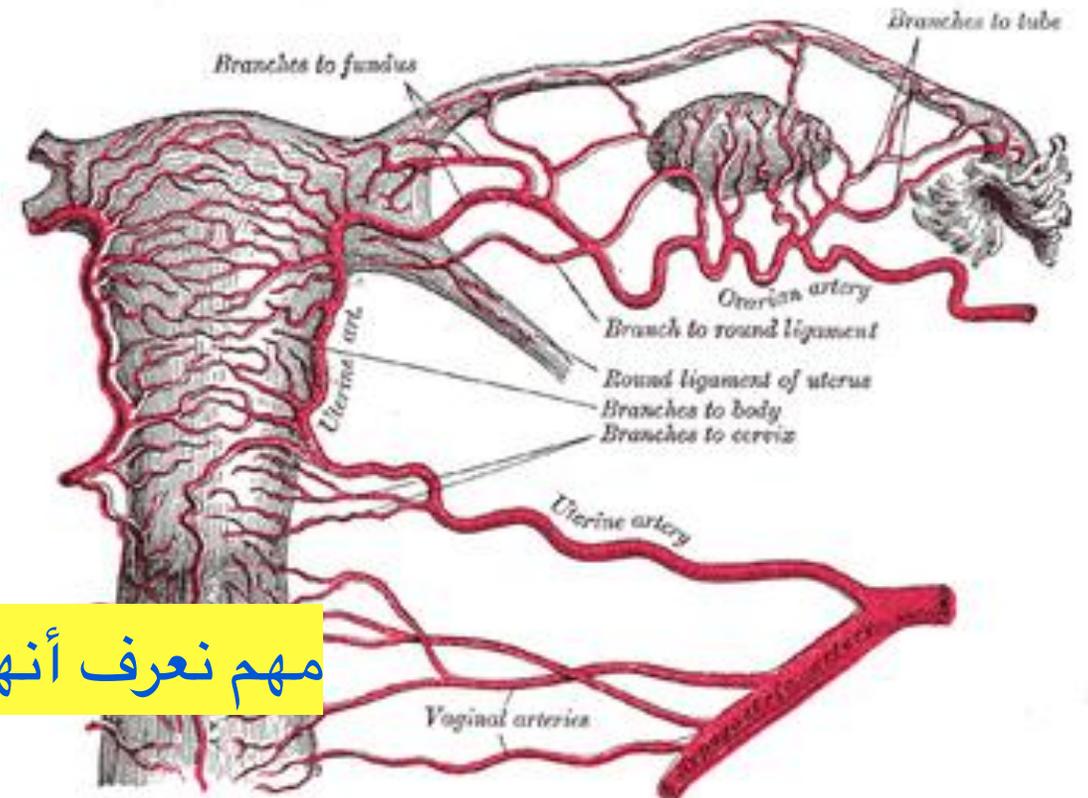
Blood Supply

Arterial supply:

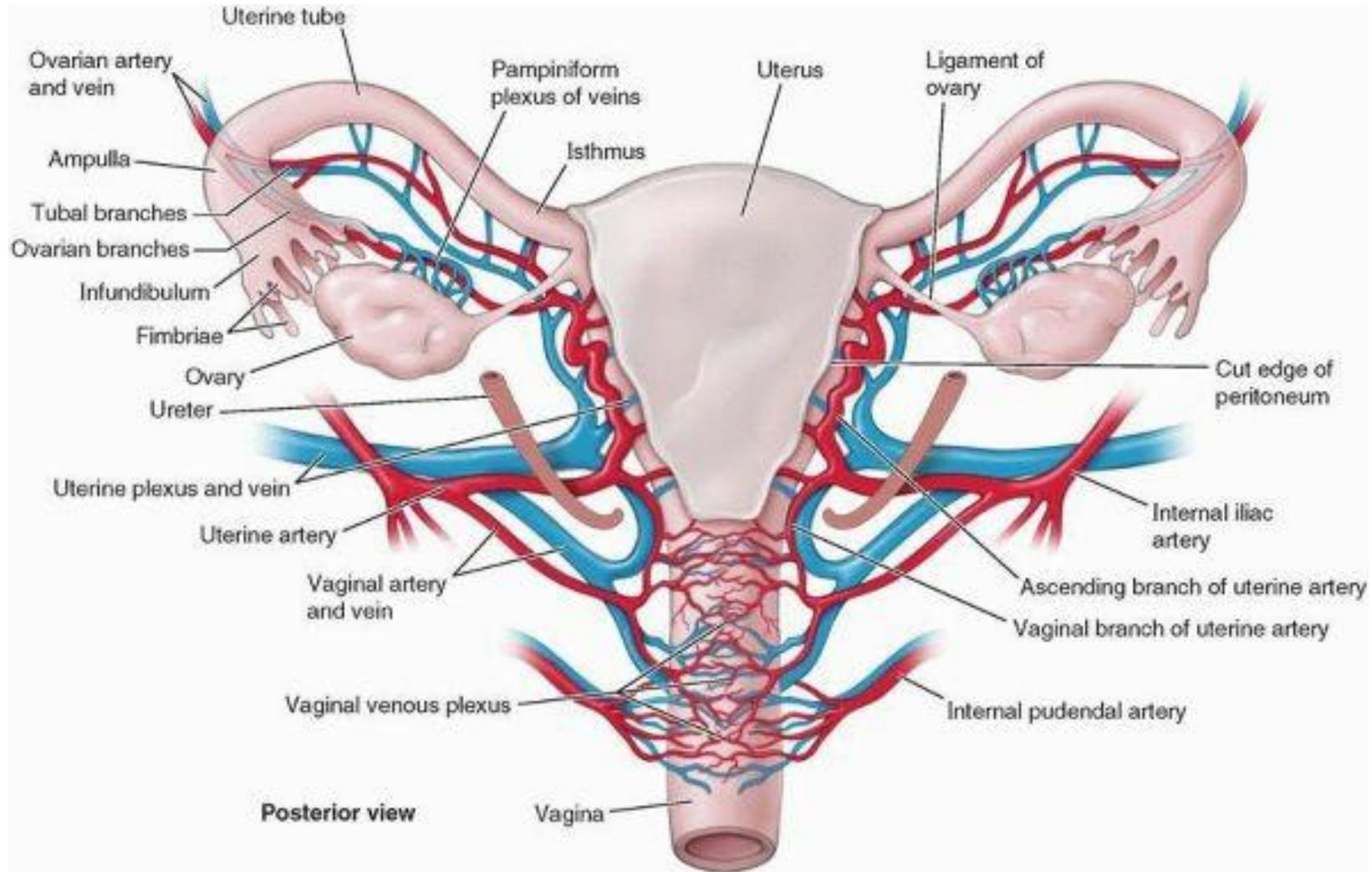
THE UTERINE ARTERIES

THE OVARIAN ARTERIES

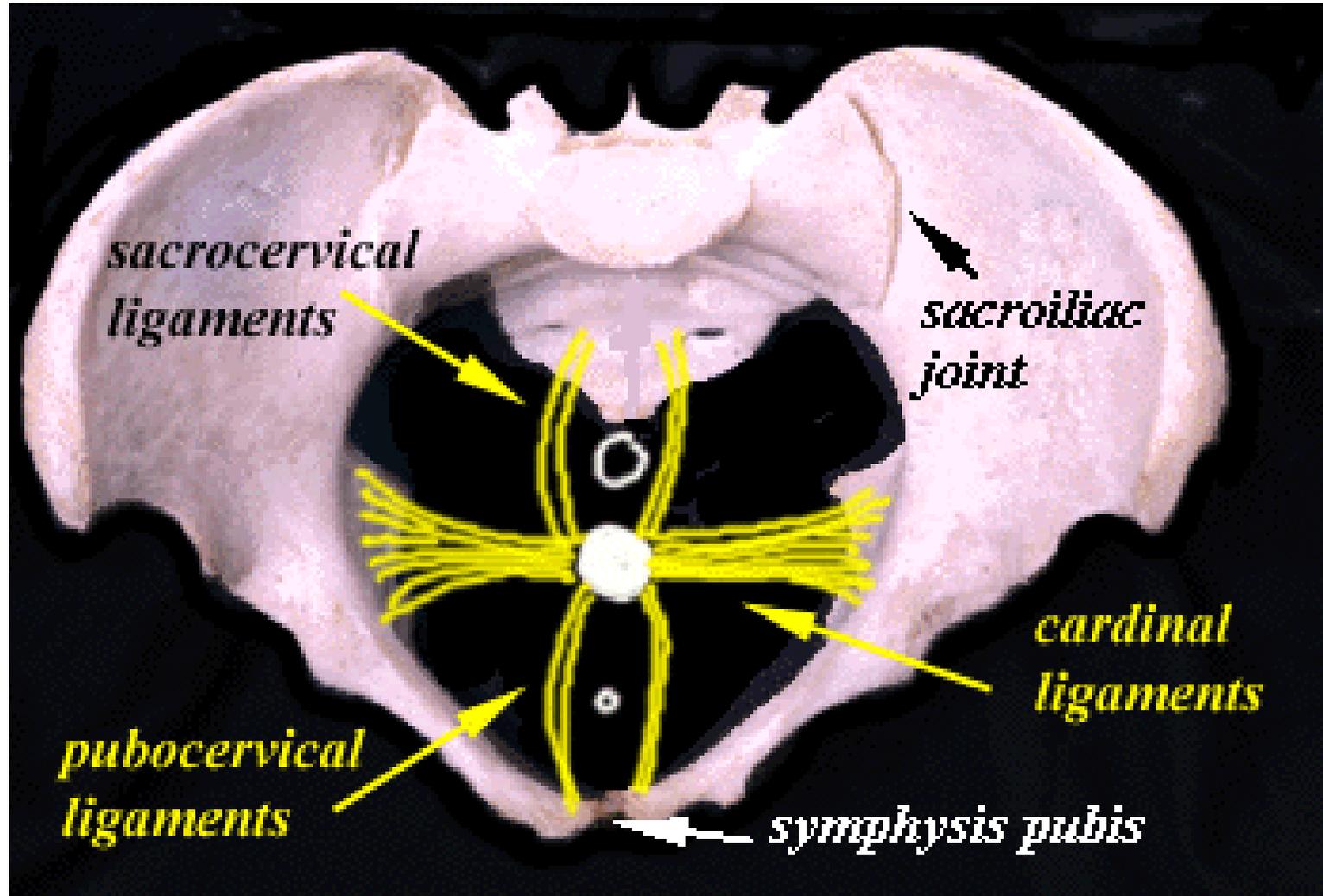
anastomosis within broad ligment مهم نعرف أنهم بيعملوا

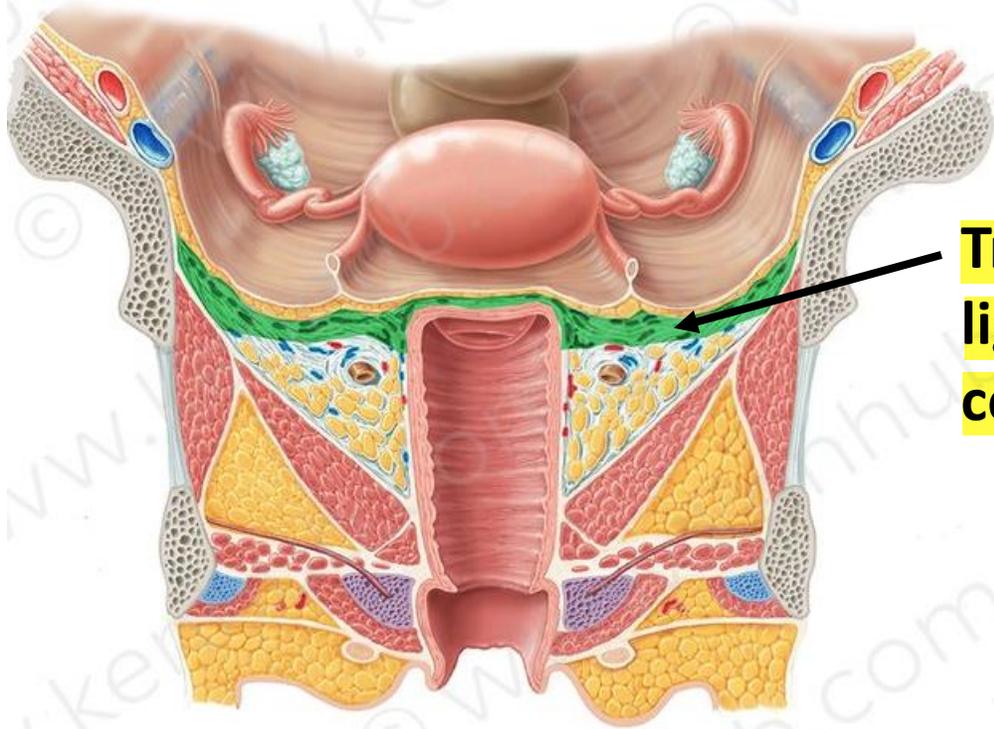


The Uterus

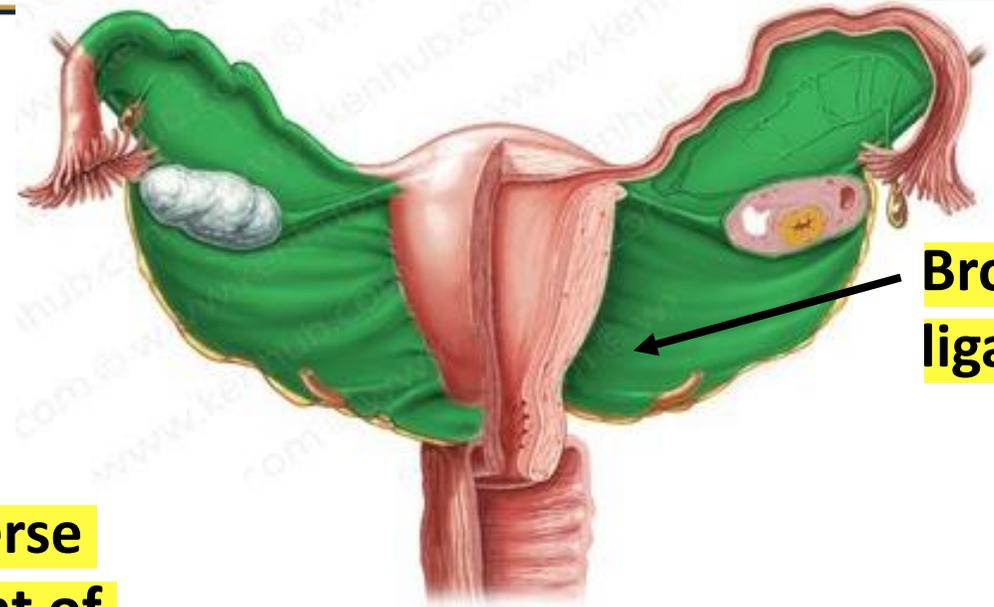


The Uterus

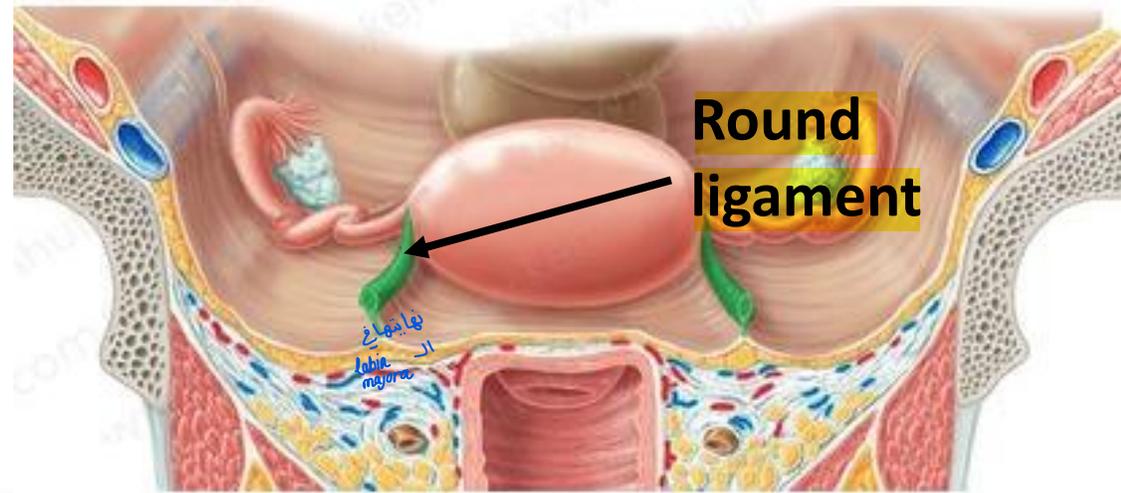




Transverse ligament of cervix



Broad ligament



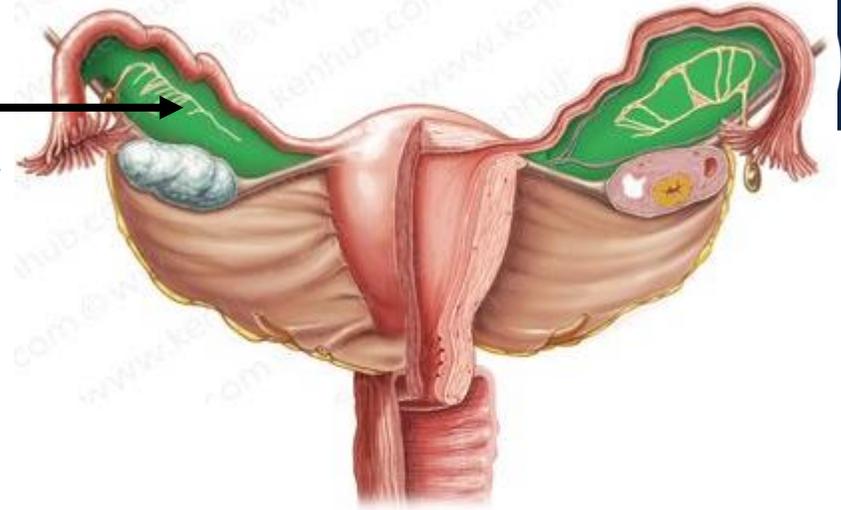
Round ligament

SAQ : Enumerate parts of broad ligament ?

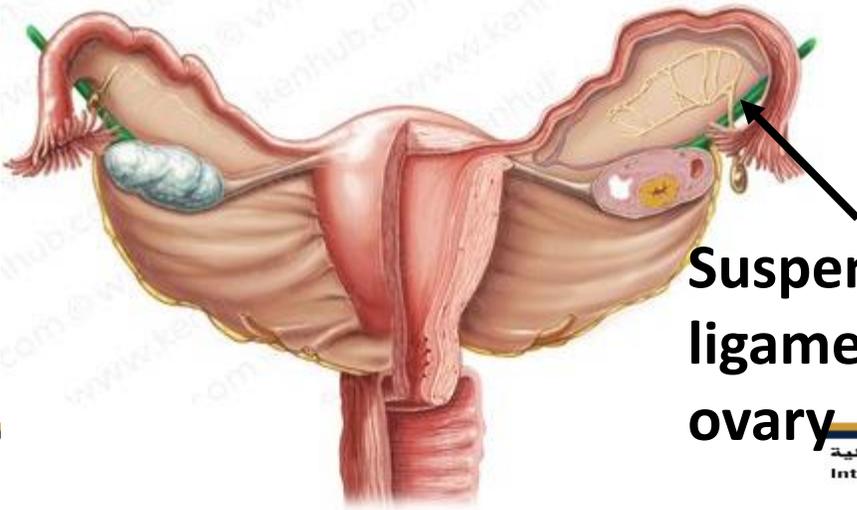
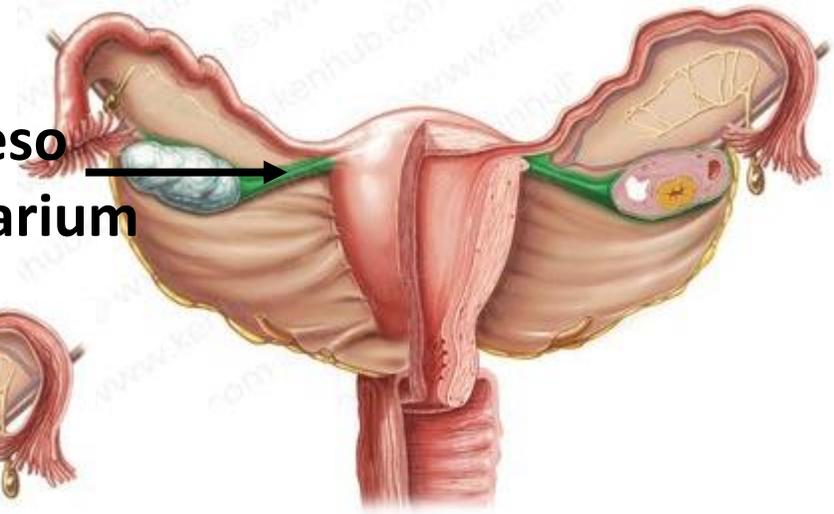
• Parts of the broad ligament:

1. Meso salpinx (Fallopiian tube)
2. Meso ovarium. (Ovary) ← **meso varium** والأصح نكتب
3. Meso metrium. (Uterus)
4. Suspensory ligament of the ovary. (Side wall of the pelvis)

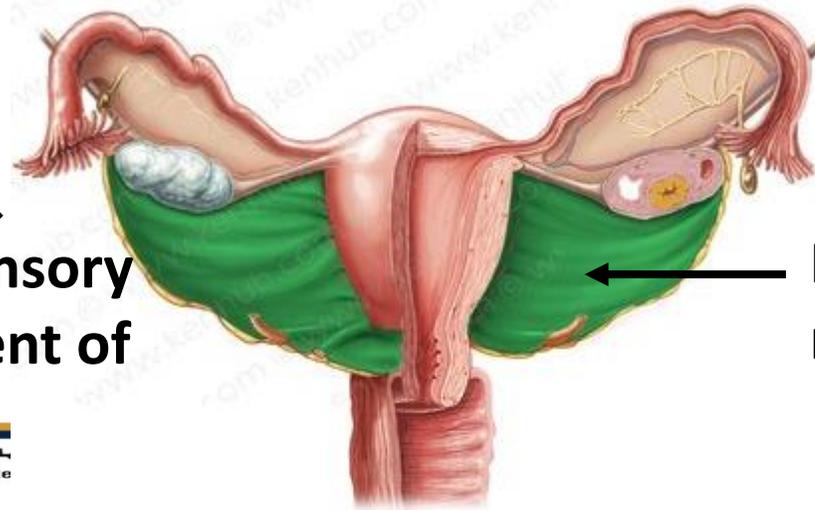
Meso salpinx



Meso ovarium



Suspensory ligament of ovary



Meso metrium



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;

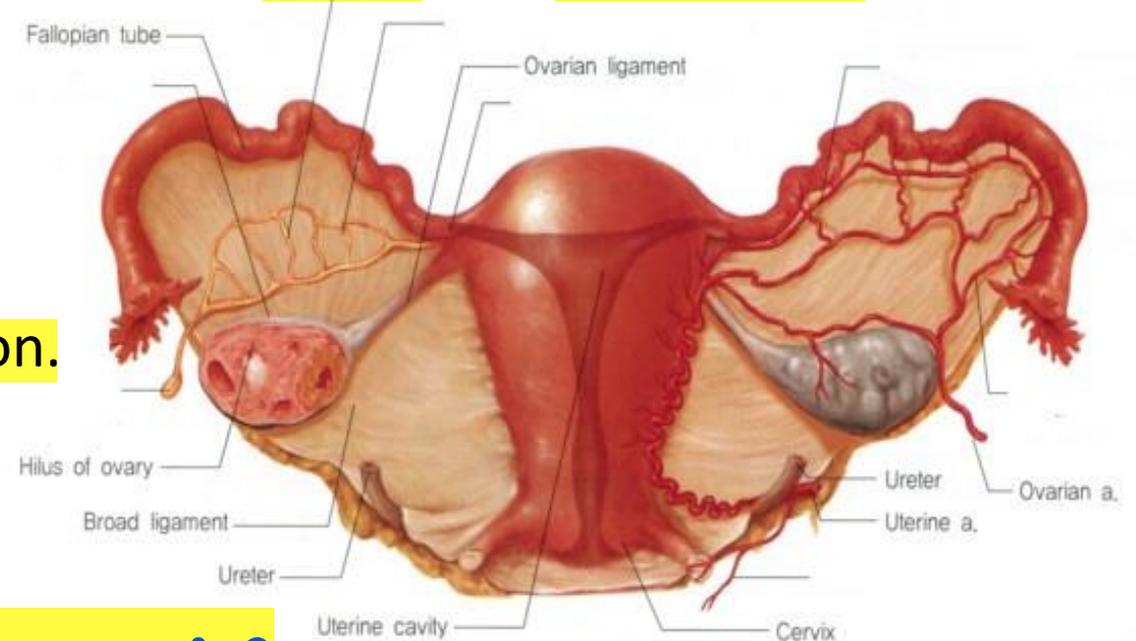
a. **Uterine artery.**

b. **Ovarian artery.**

4. Embryonic remnants: epoophron and paraophron.

5. Parametrium & extraperitonea! fatty tissue.

6. Sympathetic plexus around the arteries.



SAQ : Enumerate contents of broad ligament ?

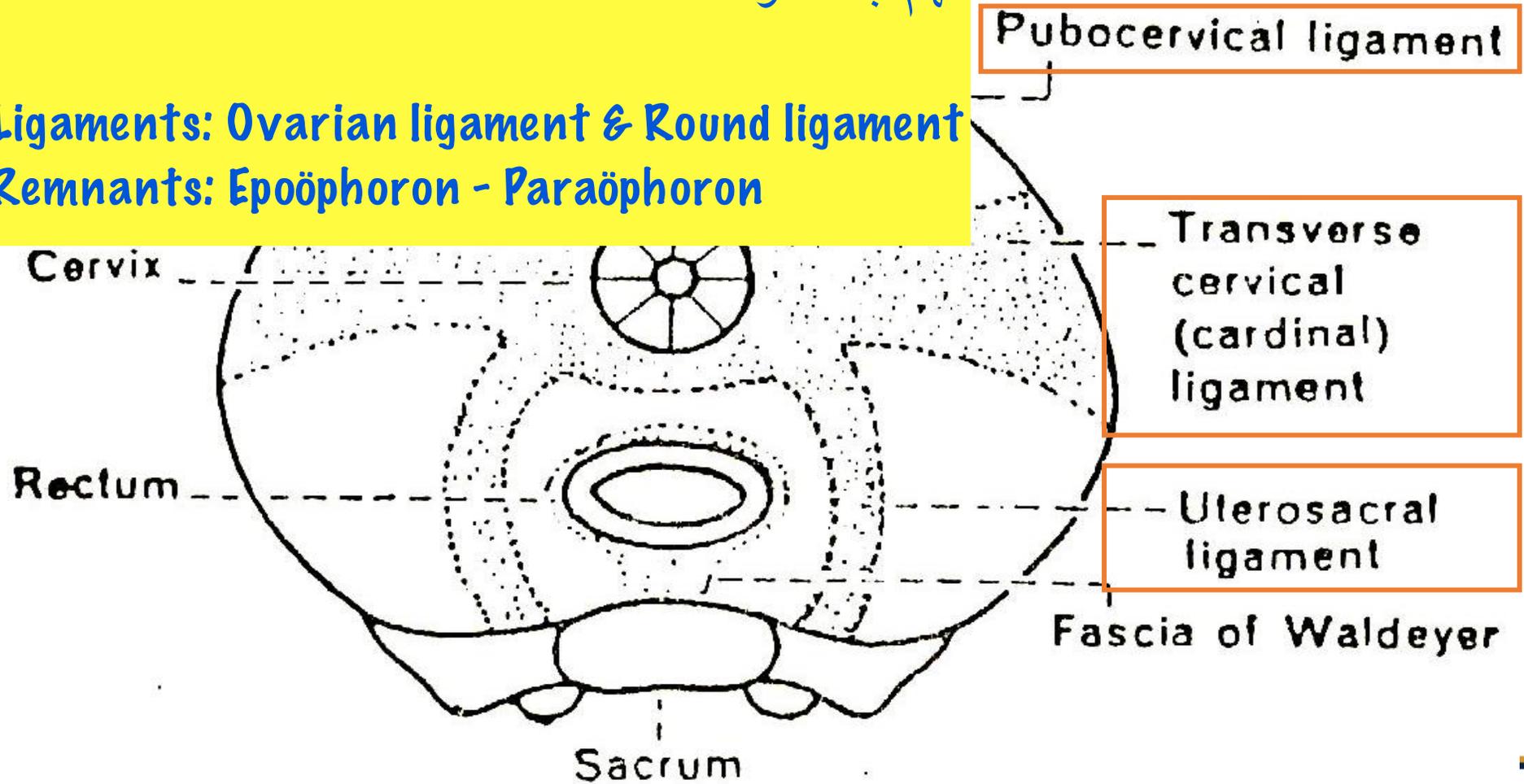
Other ligaments

A)

Pubic symphysis

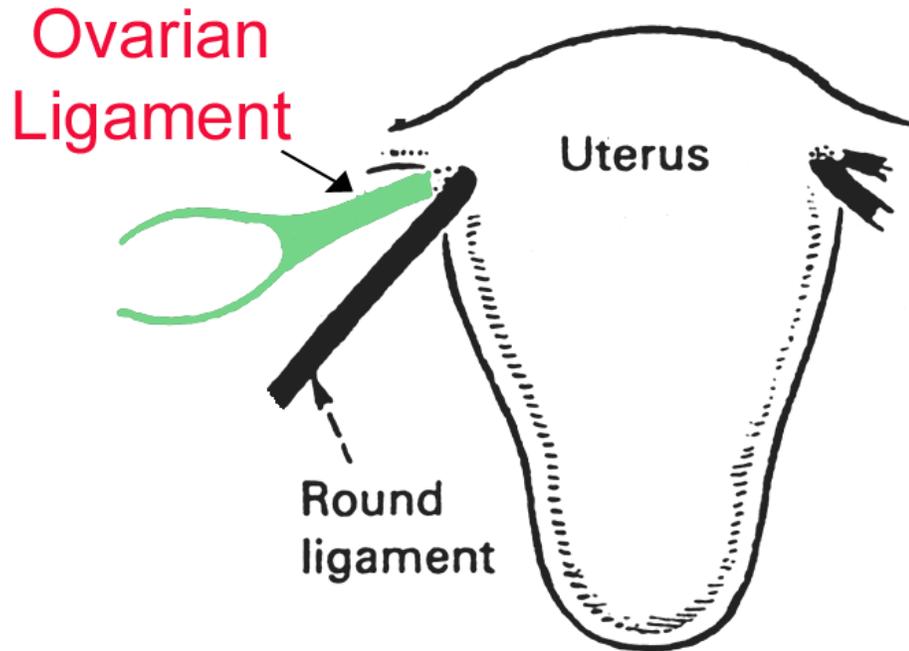
مهم جدا نعرف:

- Embryonic Ligaments: Ovarian ligament & Round ligament
- Embryonic Remnants: Epoöphoron - Paraöphoron

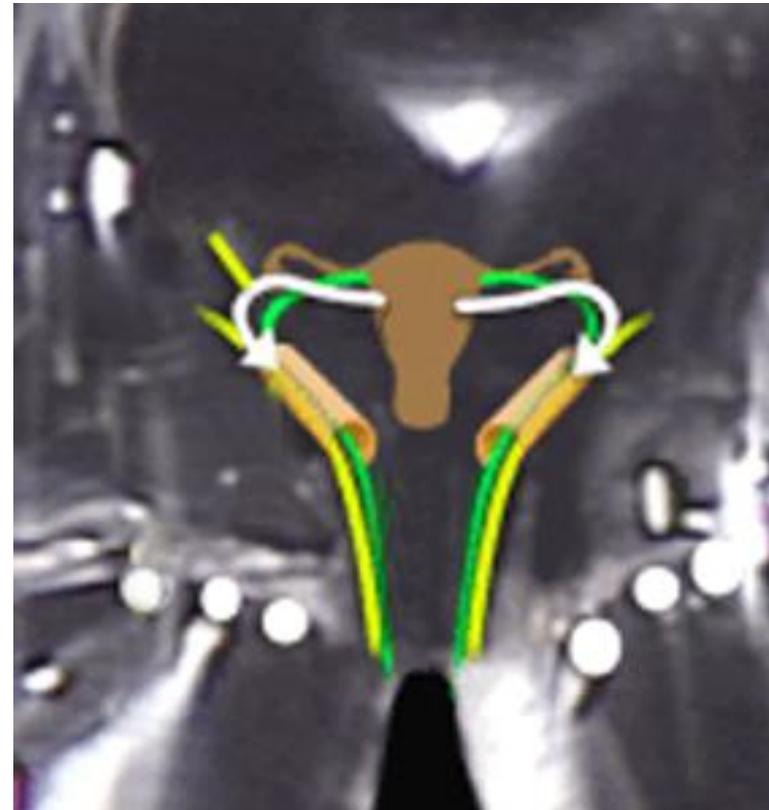


The Uterus

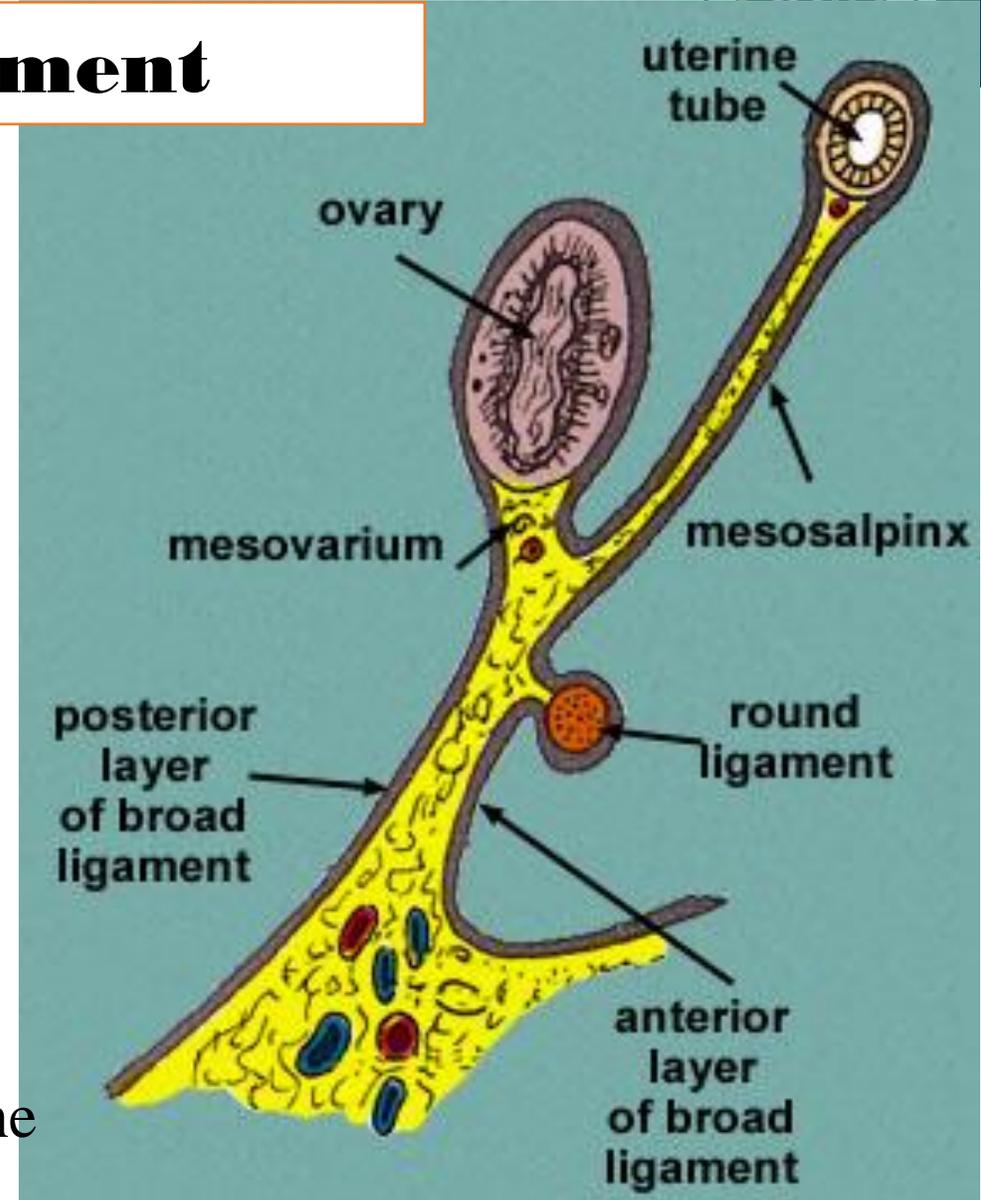
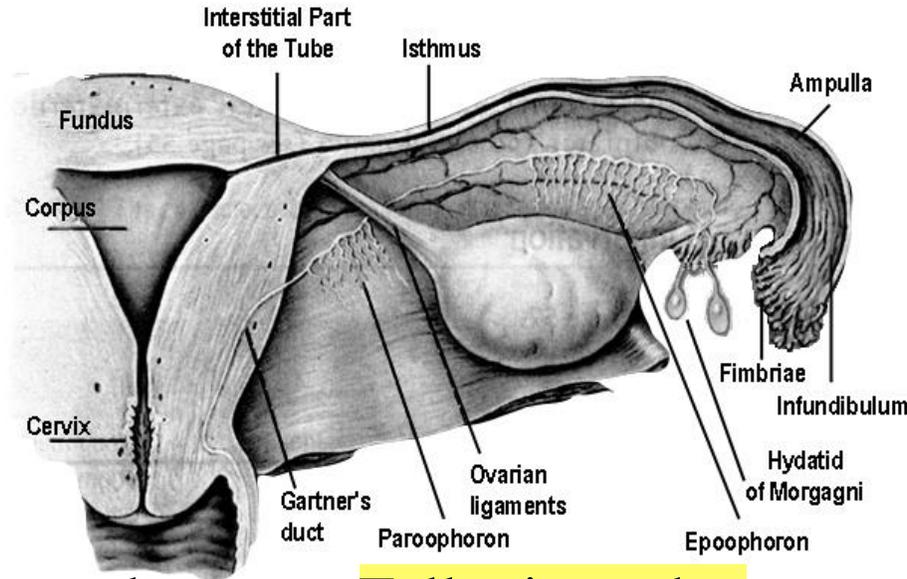
The ovarian ligament



The Round Ligament of the uterus



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

Site: it is fibro-muscular tube between the cervix and vestibule. It lies between urinary bladder and urethra (**anteriorly**) and rectum and perineal body (**posteriorly**).



The Vagina

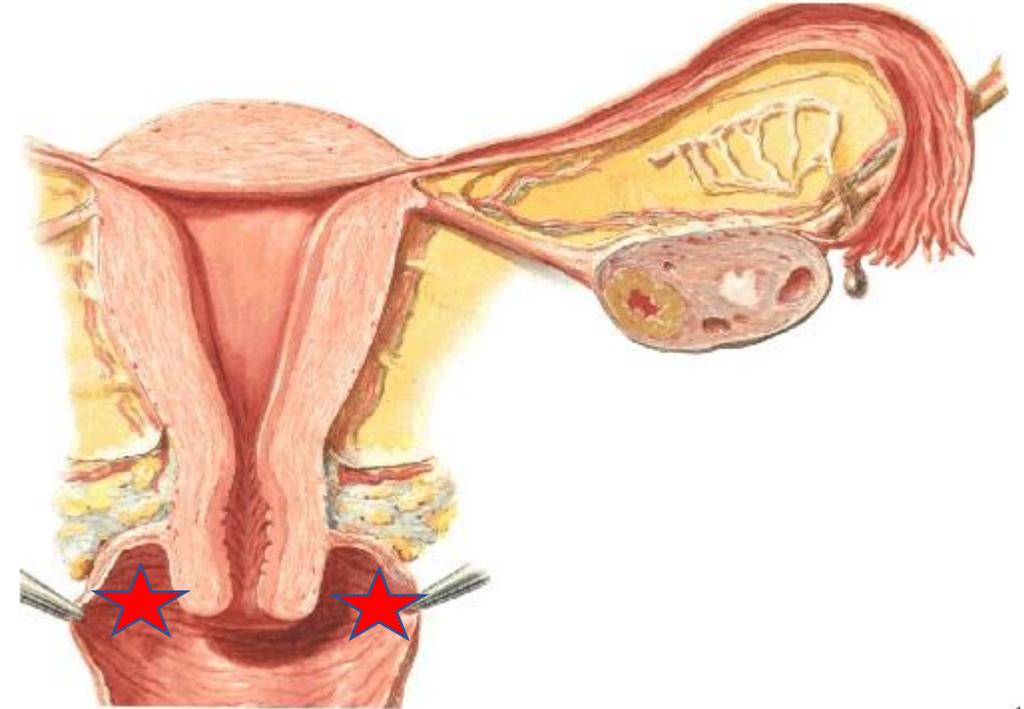
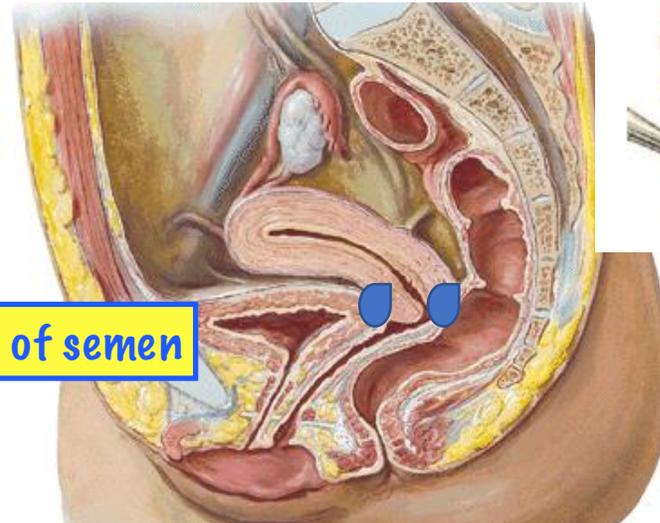
Fornices

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

Number: 4: anterior, posterior and two laterals.

MCQ The posterior fornix is the deepest one.

Deposition of semen



MCQ : Which of the following vaginal fornices is the deepest and is the main site for semen deposition ? Posterior fornix

The Vagina

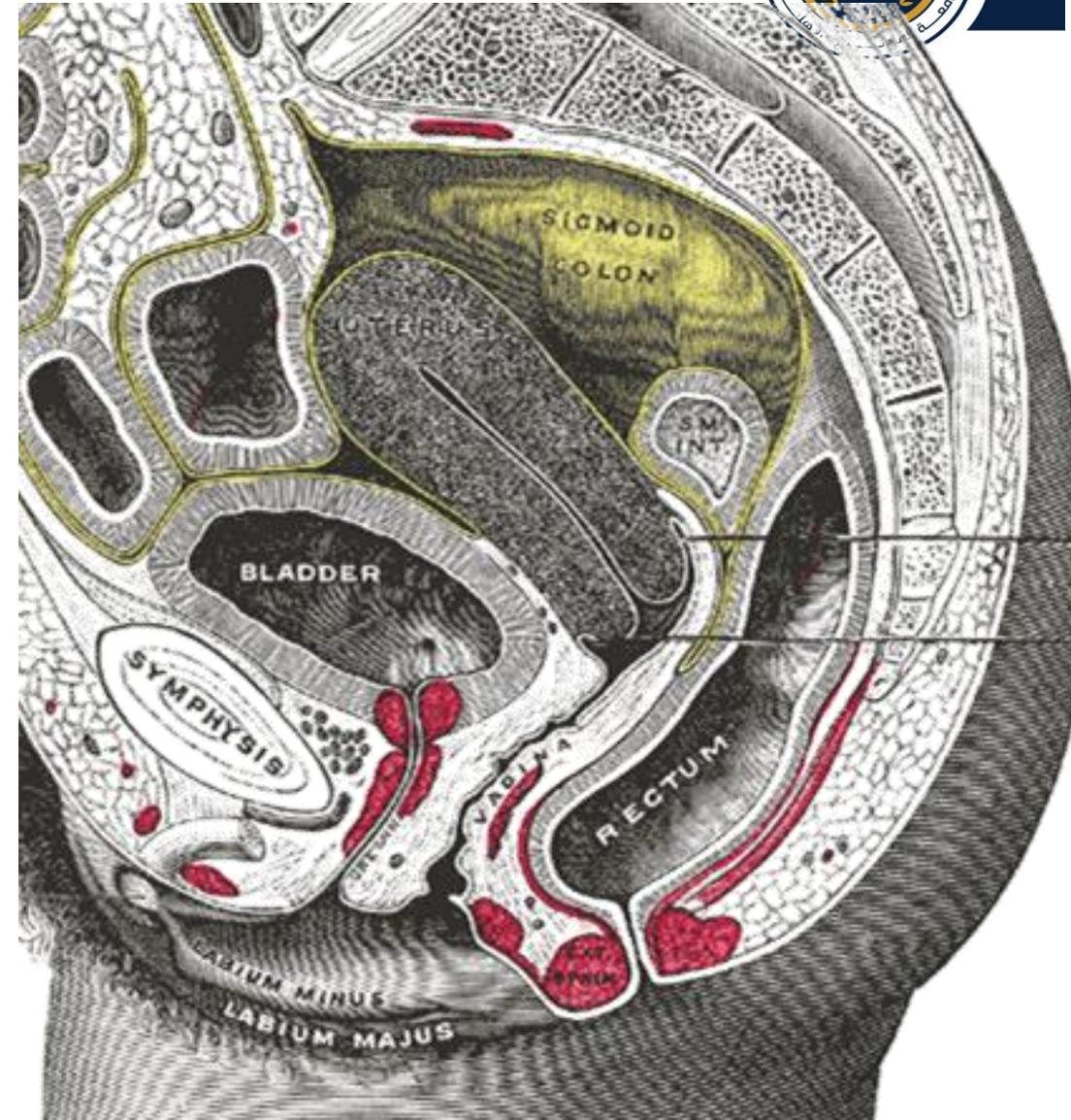
Relations of the Vagina

(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.

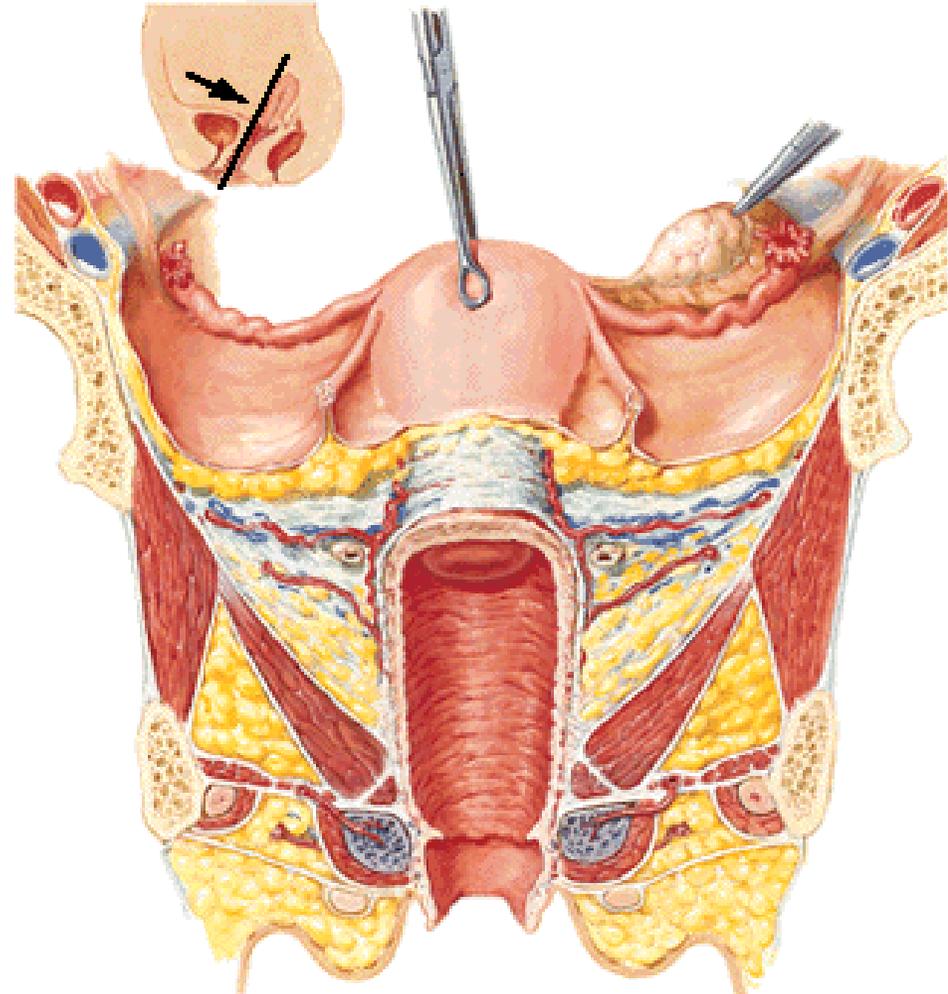


The Vagina

Relations of the Vagina

(C) **Lateral walls** : on each side:

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

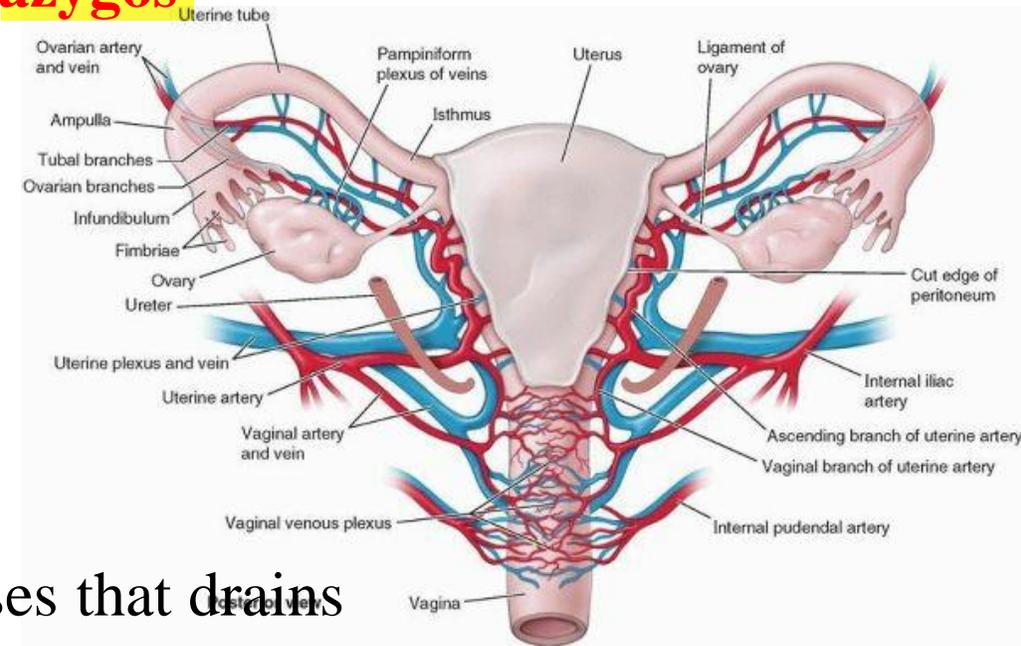
SAQ : Enumerate components of azygos artery ?
MCQ : Azygos artery is composed of:

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. & its branches

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

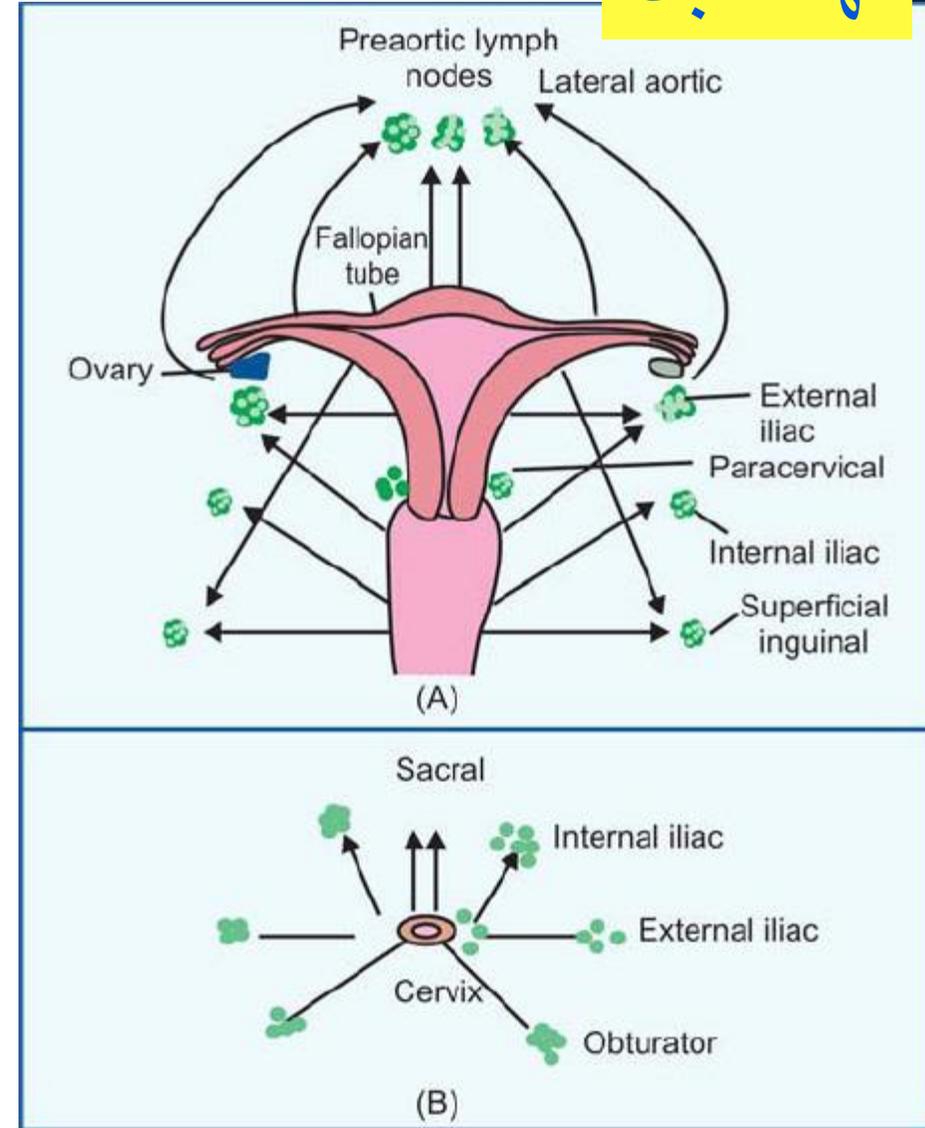


The Vagina

مهمة جدا

Lymphatic drainage:

- **Upper 1/3** → **external iliac** lymph nodes.
- **Middle 1/3** → **internal iliac** lymph nodes.
- **Lower 1/3** → **superficial inguinal** lymph nodes.



The Vagina

Applied Anatomy

- The **posterior fornix**: a **passage to the pouch of Douglas** for drainage of a **pelvic abscess**.
- The **lateral fornix**: The **ureter** lies **1-2 cm** lateral to it so that it may be injured during clamping the angle of the vagina in **hysterectomy operation**.



Culdocentesis

MCQ : Surgical approach to the Douglas pouch? Posterior fornix

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 2

A 34-year-old woman who has diabetes develops a “boil” on the right labia majora. Which of the following lymph nodes is most likely to be enlarged in response to the infection?

- A. Internal iliac
- B. External iliac
- C. Superficial inguinal
- D. Obturator
- E. Paraortic

Lower 1/3 of vagina , Vulva



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.

References

- 1. Independent learning from the Internet**
2. Sadler,T.W.:Langman's,MedicalEmbryologyWilliamsandWilkinsCo.,Baltimore,12thedition.Chapter2,P.21–24&P.29-30.
3. Sadler,T.W.:Langman's,MedicalEmbryologyWilliamsandWilkinsCo.,Baltimore,12thedition.Chapter2,P.24–27.

