



**GUS..**

## **Lecture (9)**

# **Anatomy of Female Reproductive System (2)**

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# ILOs

- 1. Describe the anatomy of uterus, location, parts, relations, blood & nerve supply, and lymphatic drainage.**
- 2. Understand the true (fibrous) ligaments supporting the uterus in its position.**
- 3. Discuss the broad and round ligaments.**
- 4. Understand the antiversion and antiflexion position of uterus.**
- 5. Describe the anatomy of vagina, relations, blood & nerve supply, and lymphatic drainage.**
- 6. Outline the anatomy of female external genitalia.**

# Uterus

## Definition:

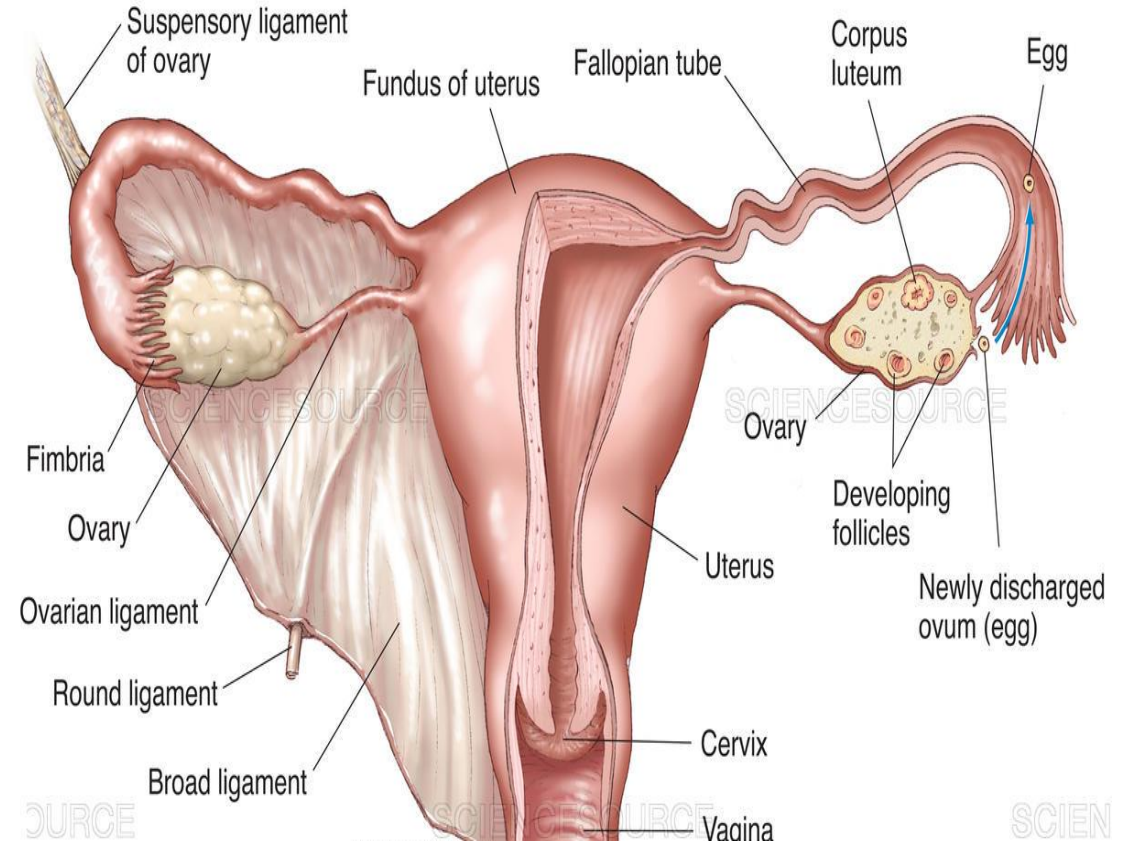
The uterus is a hollow thick – walled muscular organ.

Site: It lies in the lesser pelvis.

Shape: Shape of an inverted pear.

## Size:

In females who have never been pregnant, it is about 7.5 cm long, 5 cm wide, and 2.5 cm thick. (3×2×1) inch.



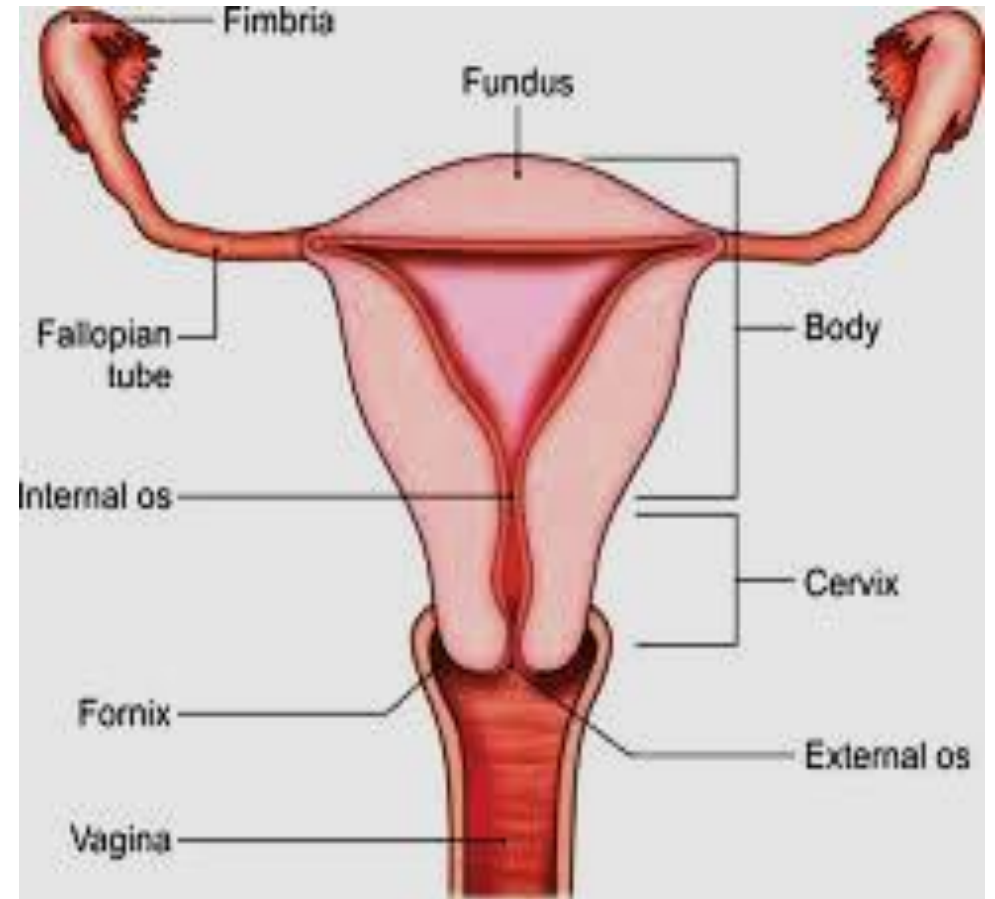
## Parts of the uterus:

The uterus is divided into two main parts:

- Body.
- Cervix.

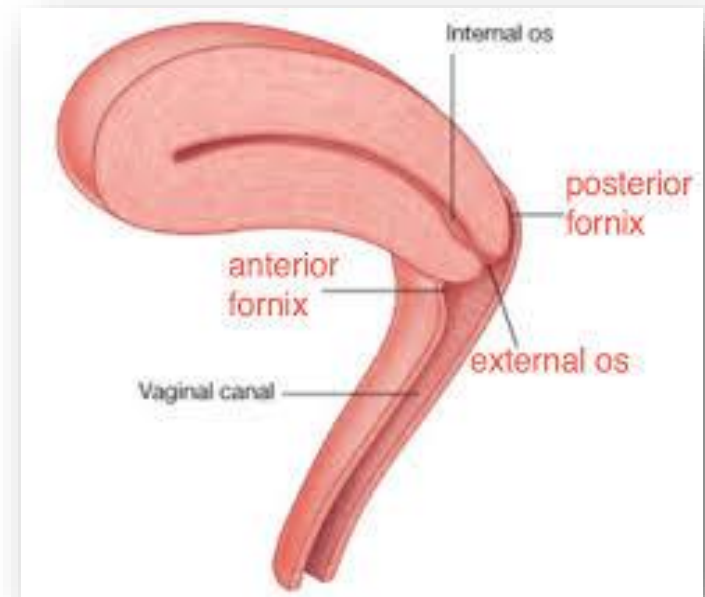
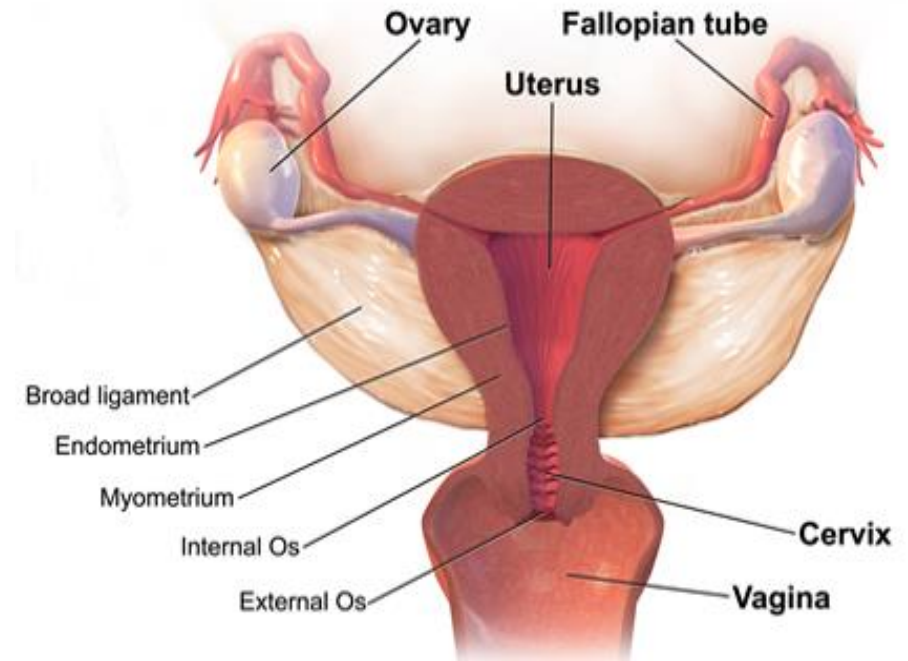
## Body of the uterus:

- It forms the upper two-thirds.
- Near its upper end, the uterine tubes enter the uterus on both sides at the uterine cornua.
- The part of the body superior to the entry points of the uterine tubes is dome-like and is called **Fundus**.



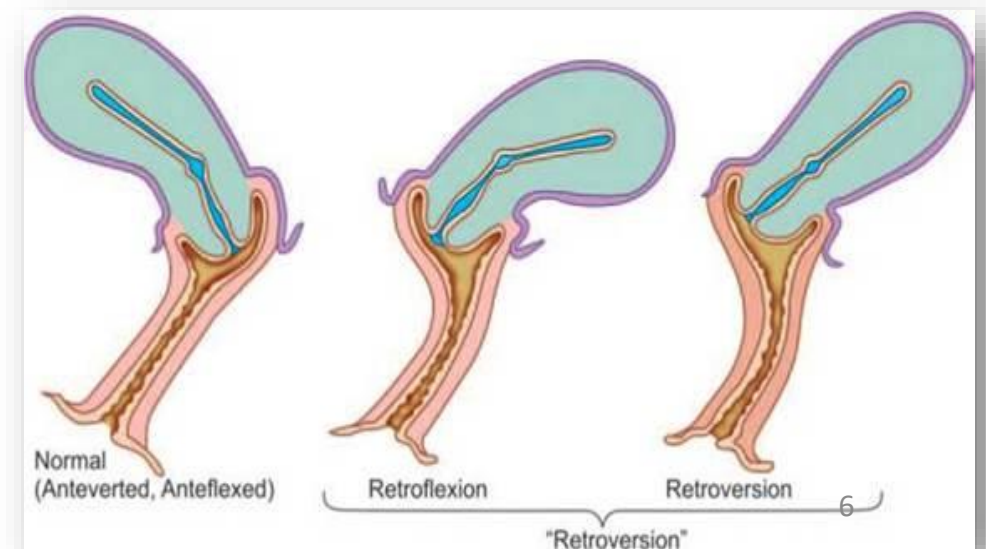
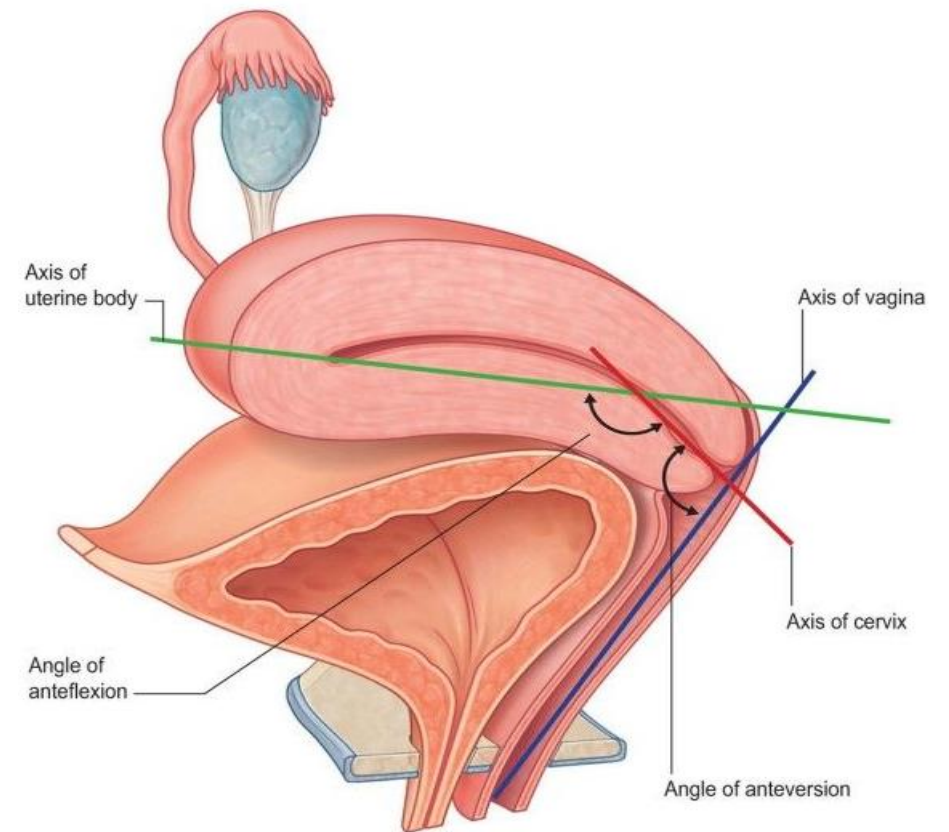
## Cervix of the uterus:

- It forms the lower third.
- It is a narrow cylindrical portion.
- Between the body of the uterus and the cervix is a constricted region about 1 cm long, **isthmus**, (at the level of internal os).
- **The cervix enters the upper end of the vagina, thereby the cervix is divided into;**
  - **Supravaginal part.**
  - **Vaginal part.**



## Positions of the Uterus:

- The normal position of the uterus in the pelvis is **anteverted anteflexed**
- **Anteverted** means that the long axis of the uterus (cervix) is bent forward on the long axis of the vagina.
- **Anteflexed** means that the long axis of the body of the uterus is bent forward at the level of the internal os on the long axis of the cervix.
- In some women, the whole uterus are bent backward on the vagina so that they lie in the rectouterine pouch. In this situation, the uterus is said to be **retroverted**.
- If the body of the uterus is, in addition, bent backward on the cervix, it is said to be **retroflexed**.

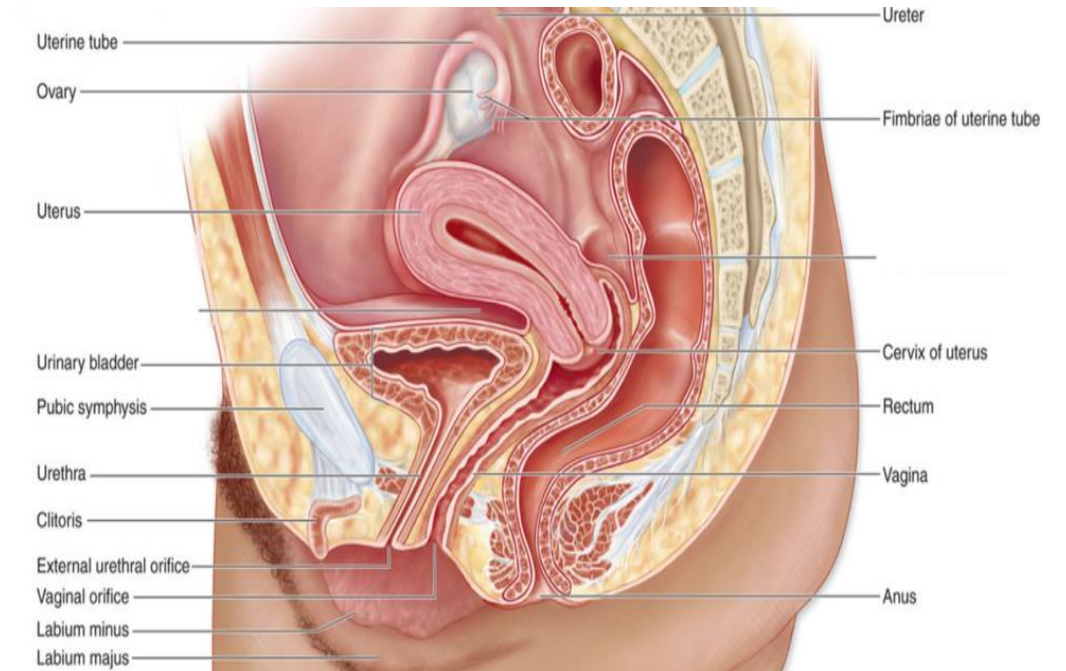
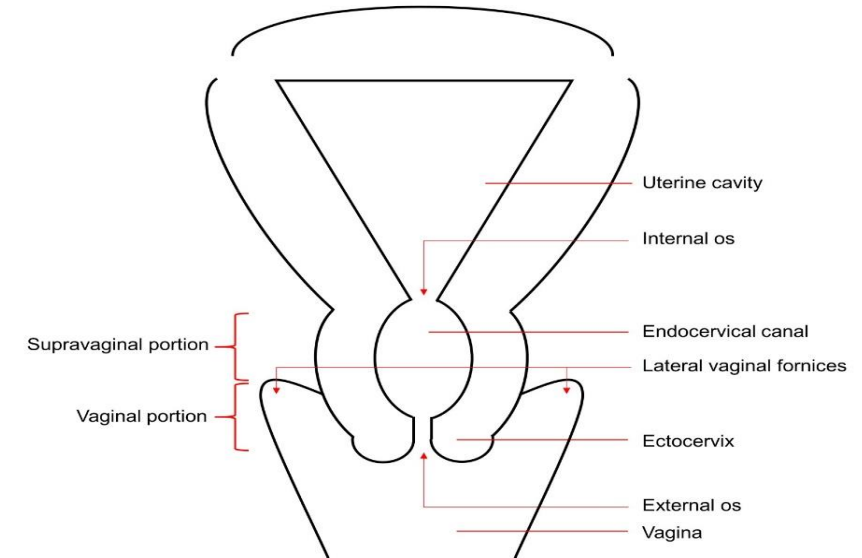




## Cavity of Uterus:

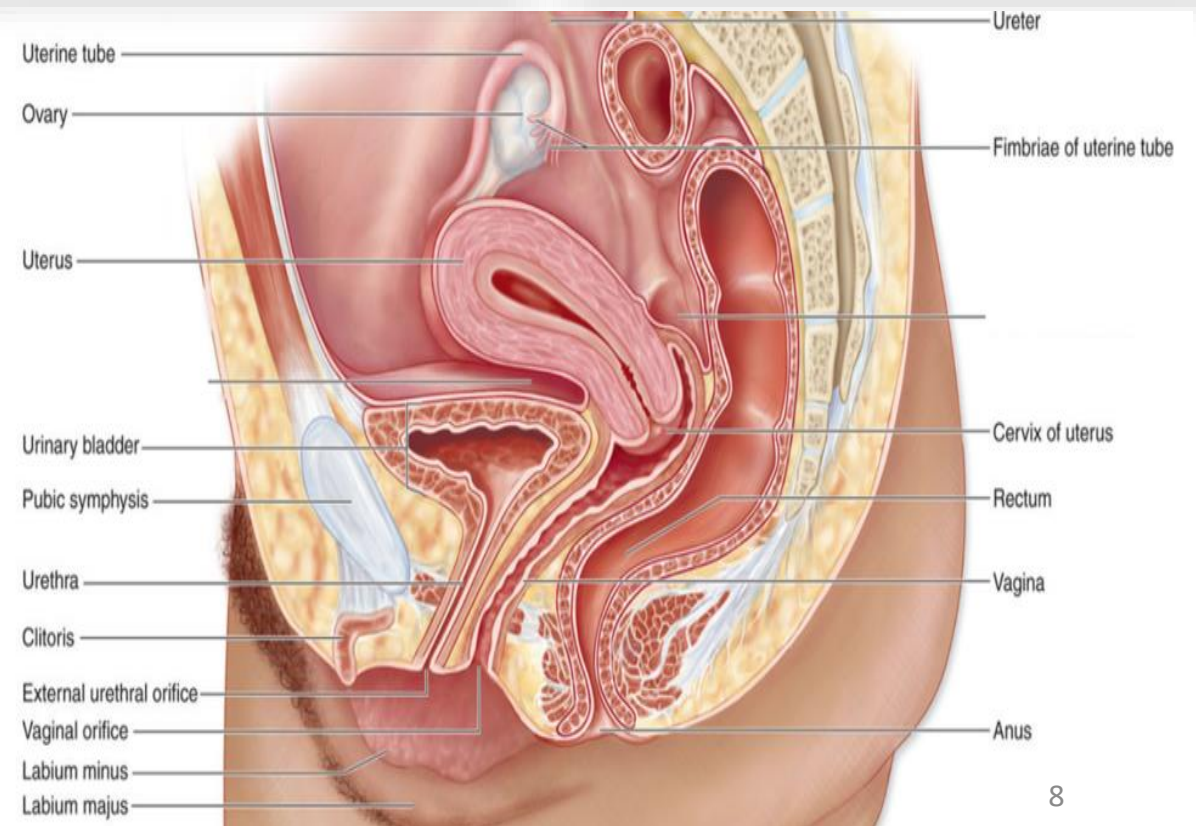
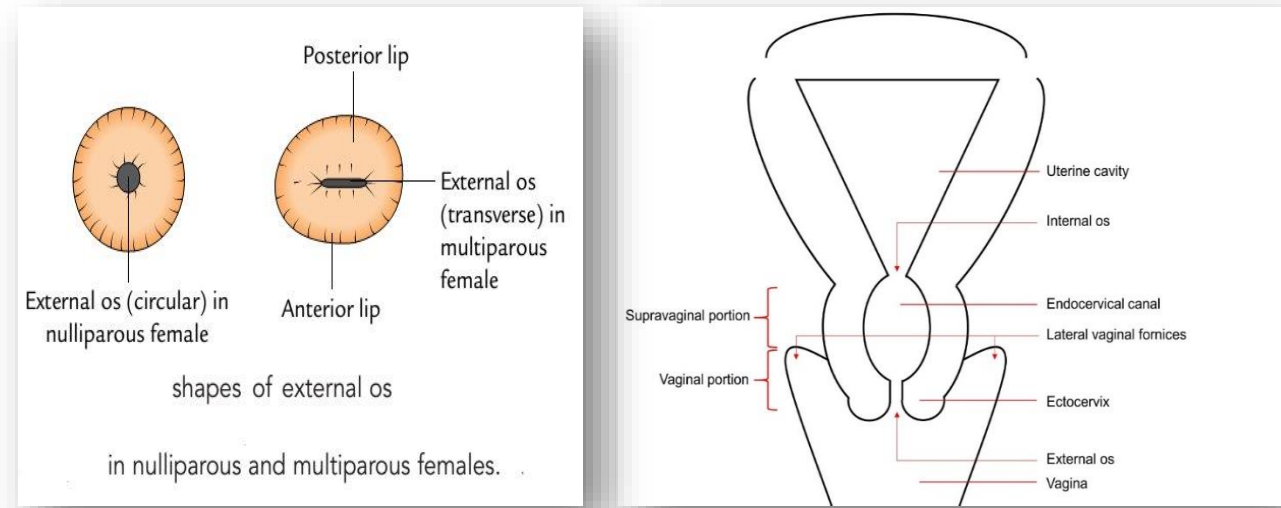
### a-The cavity of the body of the uterus:

- **In a sagittal section;** It appears as a narrow slit where the anterior and post walls are close together.
- **In coronal section,** The cavity is triangular with the base towards the fundus and the apex towards the cervix.



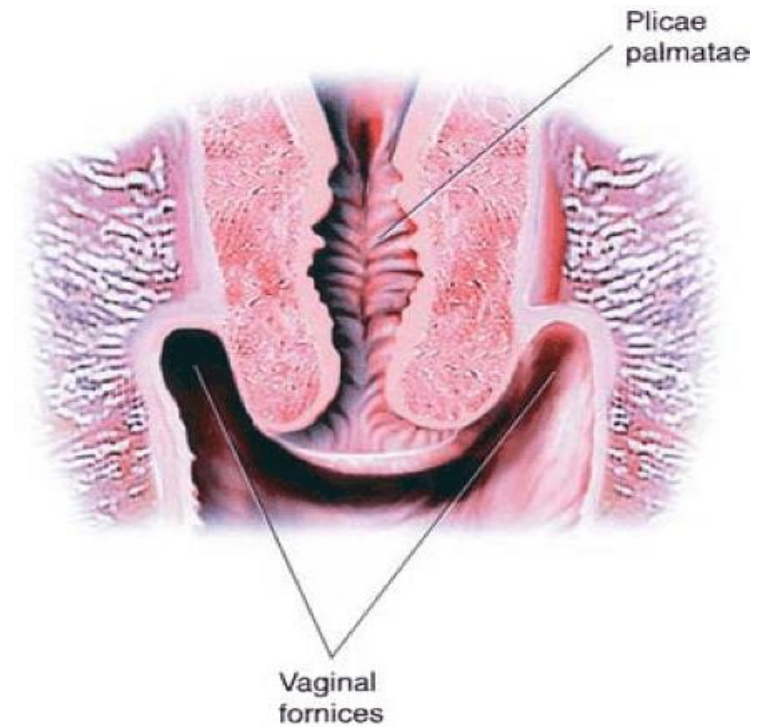
## **b-The cavity of cervix (cervical canal):**

- It is **fusiform in shape**; being wider in the middle but narrows at its ends.
- It opens into the cavity of the body of the uterus through an opening called the **internal os**.
- The canal opens into the vagina through the **external os**, this opening is directed backwards towards the posterior wall of the vagina.
- **In nulliparous women**, the external os is usually a circular aperture, whereas after childbirth it is a transverse slit.





- Its anterior and posterior walls show mucosal ridges with small side branches which are known as the palmate folds. This appearance is called **arbor vitae uteri**.
- The folds of both anterior and posterior walls fit into each other to close the cervical canal.



# Relations of Uterus

## Body of the uterus:

- **Fundus:** It is convex in all directions & covered by peritoneum that separates it from the sigmoid colon and coils of ileum.
- **Below the level of entrance of uterine tube, the body** has the following relations:

## a-The anterior surface:

- It is related to the bladder, from which it is separated by the uterovesical pouch.

## b-The posterior surface:

- It is directed upwards and backwards and is related to rectouterine (Douglas) pouch.

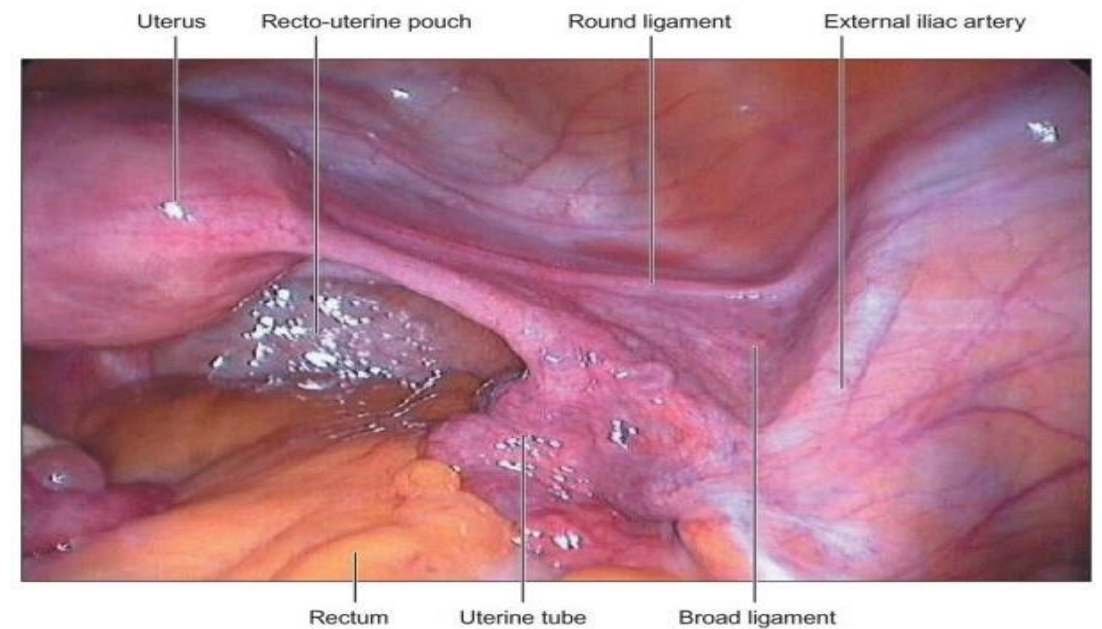
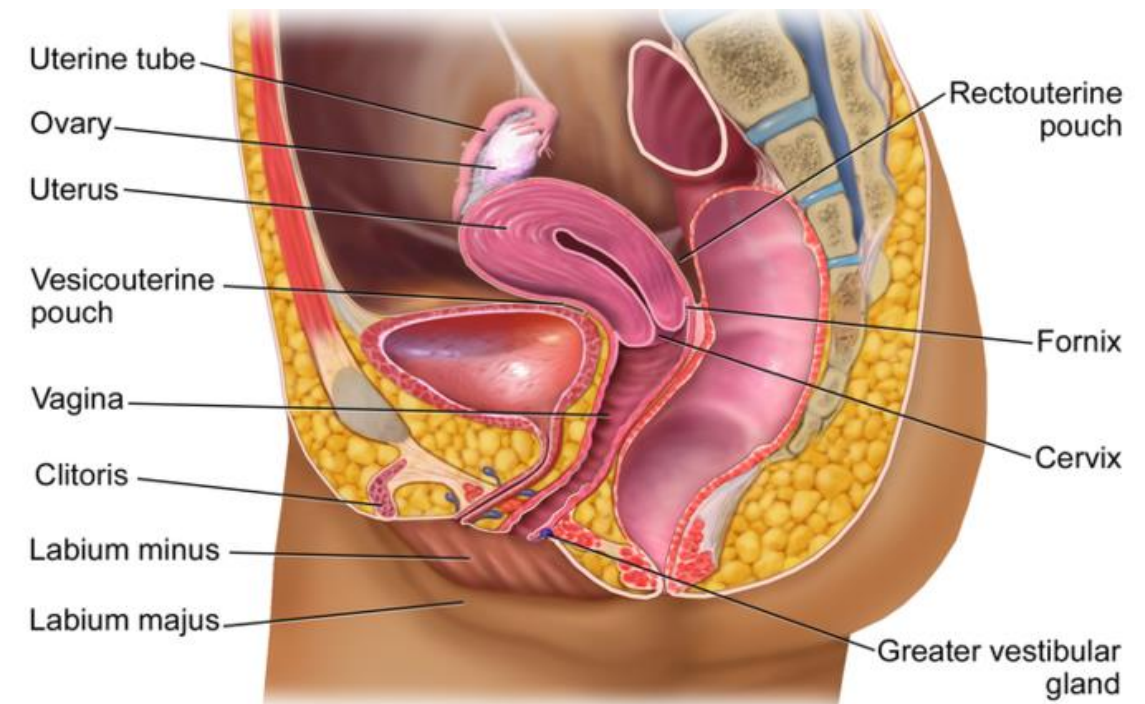
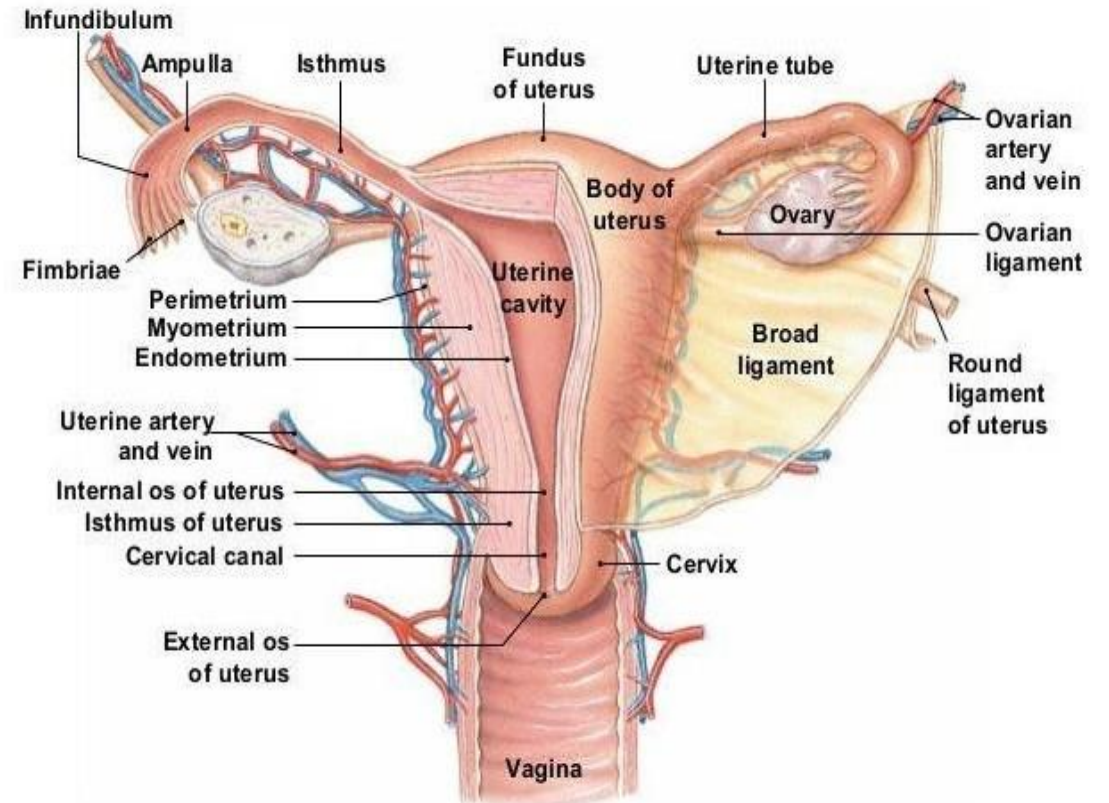


Fig. 77.13 Laparoscopic view of the broad ligament.

### c-The lateral borders:

- On each side **gives attachment to** the broad ligament of the uterus.
- **The uterine vessels** run along this border between the two layers of the broad ligament.

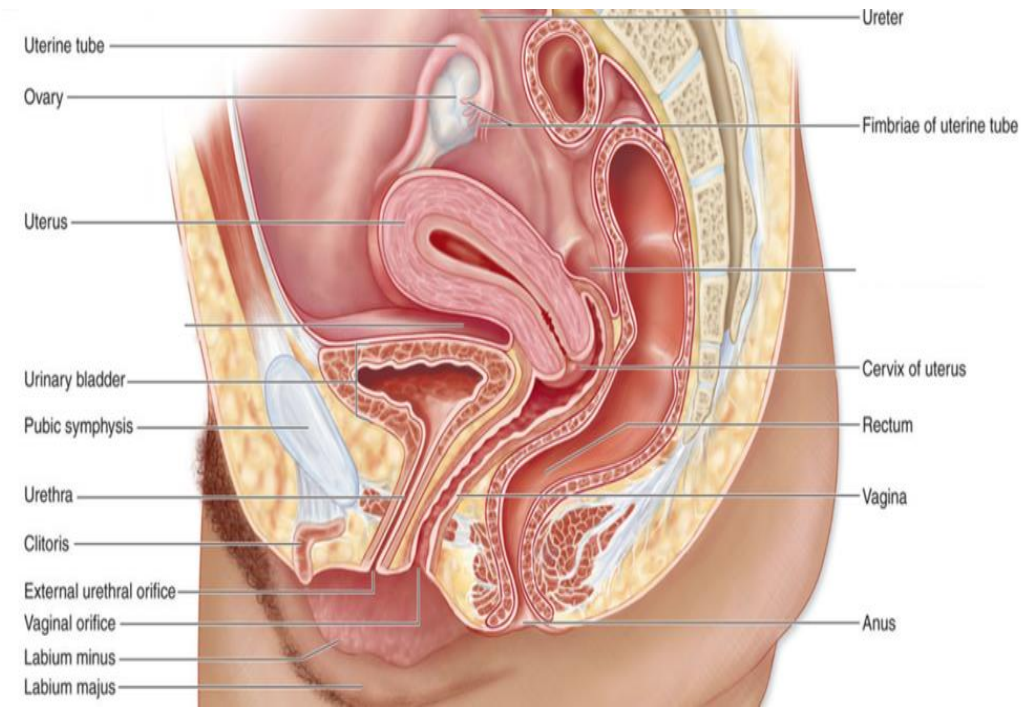




## Relation of Cervix:

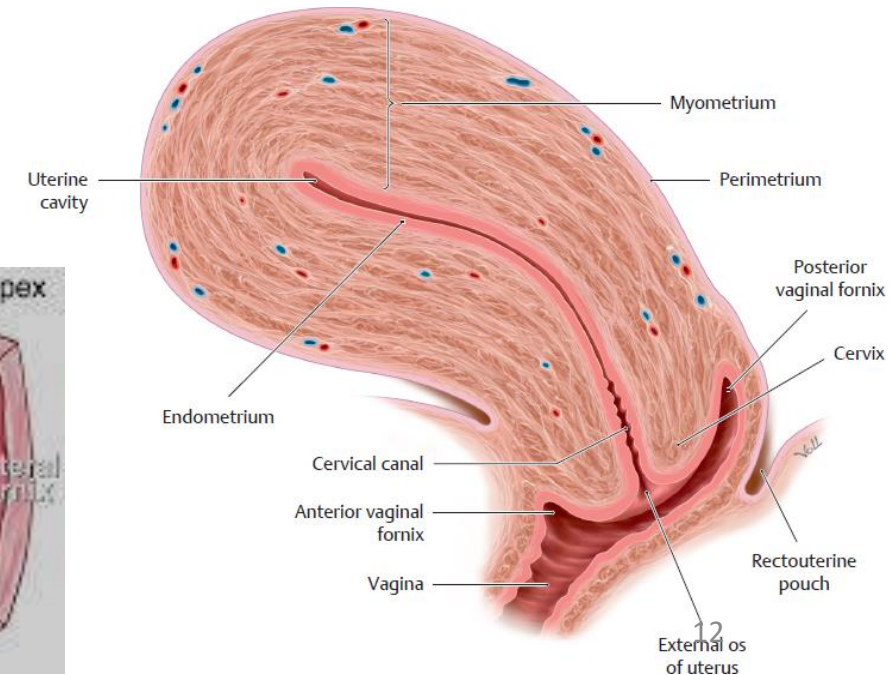
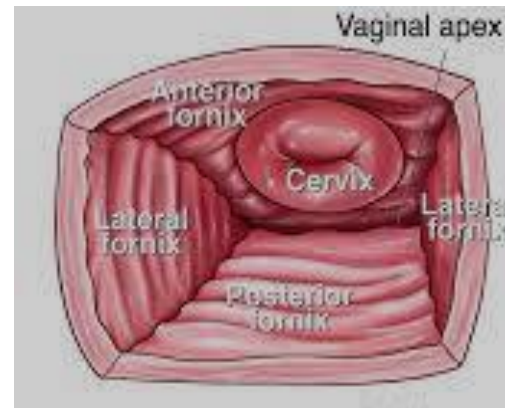
### **A-The supravaginal part**

- **Anteriorly;** Base of the bladder (direct contact).
- **Posteriorly;** Rectouterine (Douglas) pouch.
- **Laterally;** Uterine vessels and the ureters.



### **B-The vaginal part:**

- **Anteriorly;** anterior fornix of vagina.
- **Posteriorly;** posterior fornix of vagina.
- **Laterally;** lateral fornix of vagina one on each side.

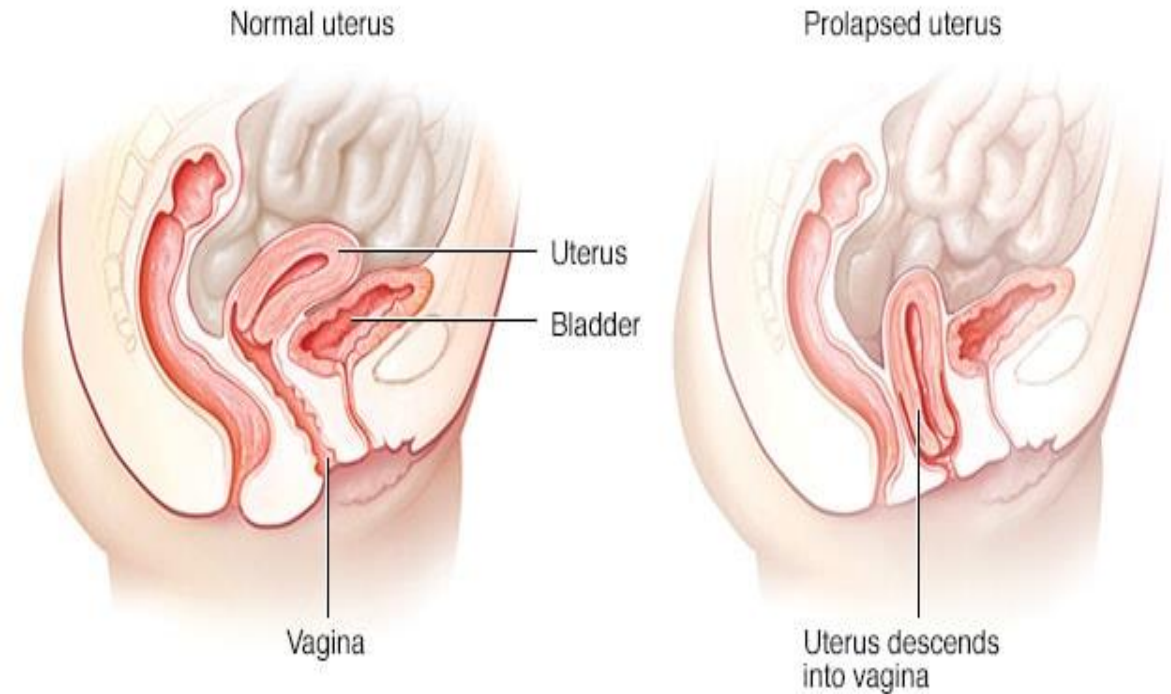


## Factors support the uterus in its position:

- Levator ani muscles.
- Ligaments of the uterus.
- Urogenital diaphragm.
- Perineal Body.

## Applied anatomy:

- Weakness of the uterine supports specially the muscles of the pelvic floor, leads to downward displacement of the uterus. This condition is called **uterine prolapse**.





## Ligaments of the uterus:

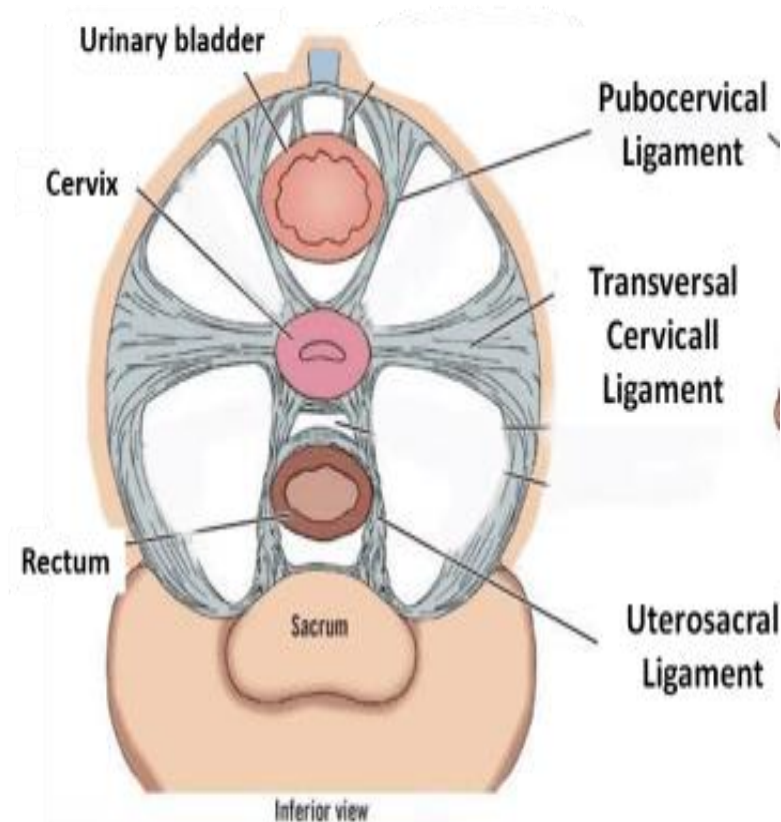
The uterus is attached to the pelvic walls and the neighboring organs by ligaments.

### **1-Transverse cervical ligaments (Mackenrodt's ligament):**

- Extend from the side of the cervix & lateral fornix of the vagina to the side wall of the pelvis.
- Lie in the base of the broad ligament.
- They are the most important ligament of the ligaments of the uterus so, it is called **the cardinal ligament** of the uterus.

### **2-Pubocervical ligaments.**

- Extend from the cervix forwards to the body of the pubis



### 3-Round ligaments of the uterus:

- Attached to the superolateral angle of the uterus.
- Pass through the corresponding inguinal canal to end in the labium majus.

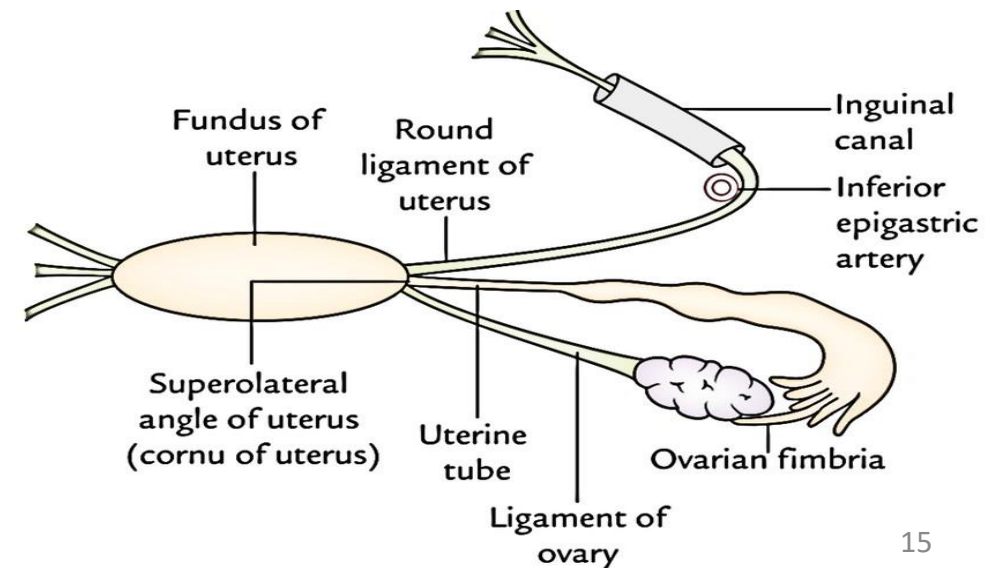
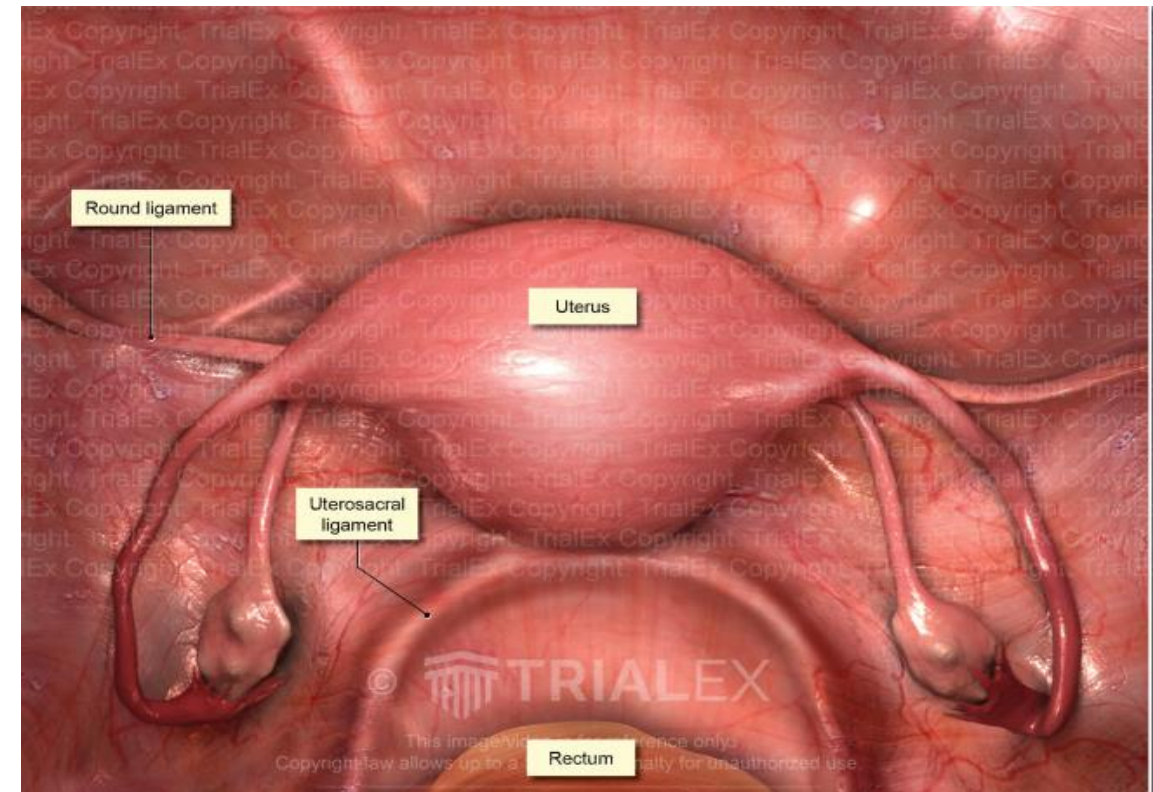
### 4-Ligaments of the ovary.

### 5- Uterosacral ligaments:

- Extend from the cervix to the sacrum on the side of the rectum. They are covered by recto-uterine folds.

**6-Anterior ligament:** Uterovesical peritoneal folds.

**7-Posterior ligament:** Rectouterine peritoneal folds.

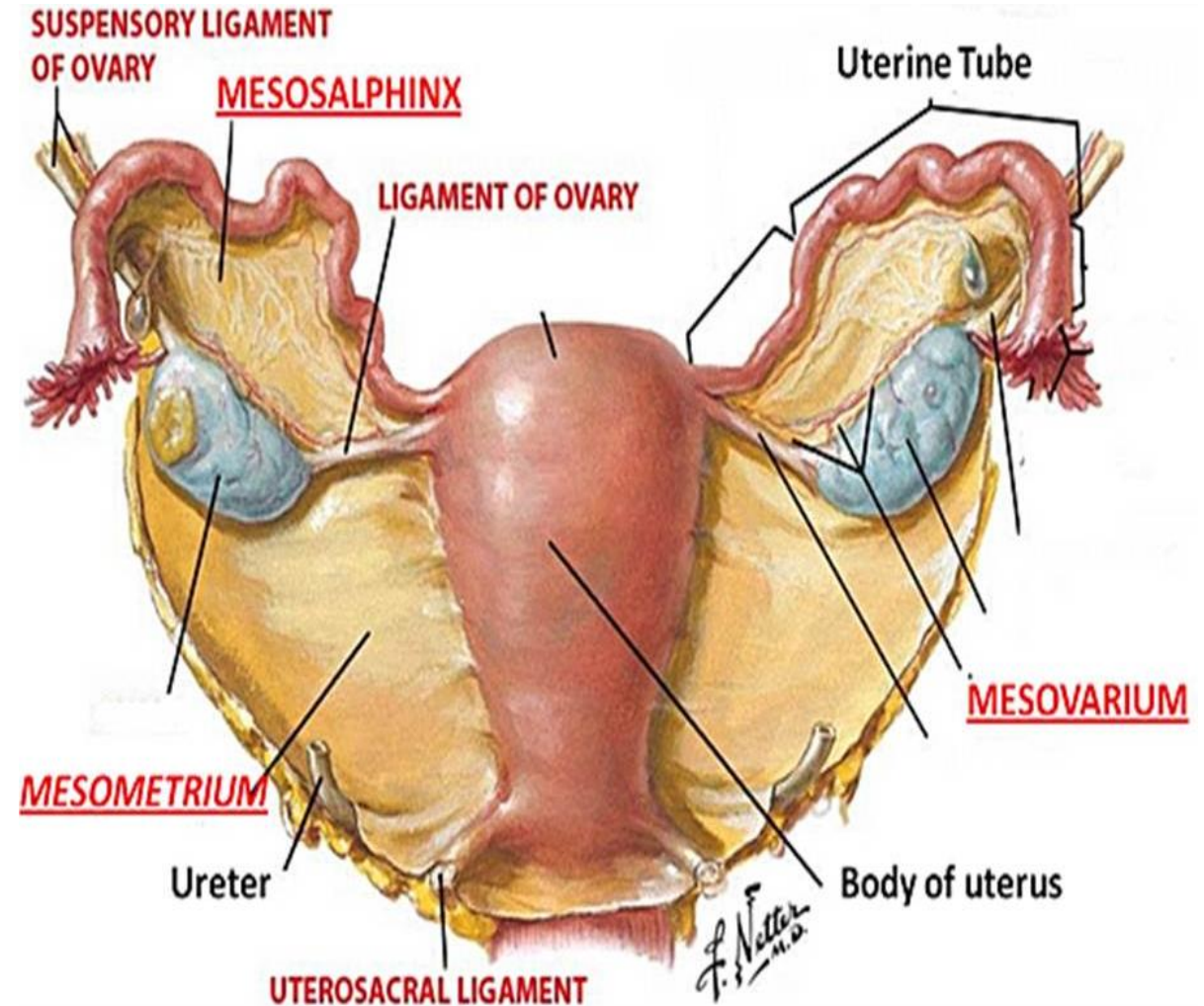


## 8- Broad ligaments:

- They extend on each side from the uterus to the lateral pelvic walls, where they become continuous with the peritoneum covering those walls.

### The broad ligament has;

- A free upper (anterior) border enclosing the uterine tube.
- Lower border (posterior) which is attached to the pelvic floor, forming the root of the broad ligament.
- The ligament also has two surfaces; posterior (upper) and anterior (lower) surface.





The broad ligament of the uterus is represented into 4 parts:

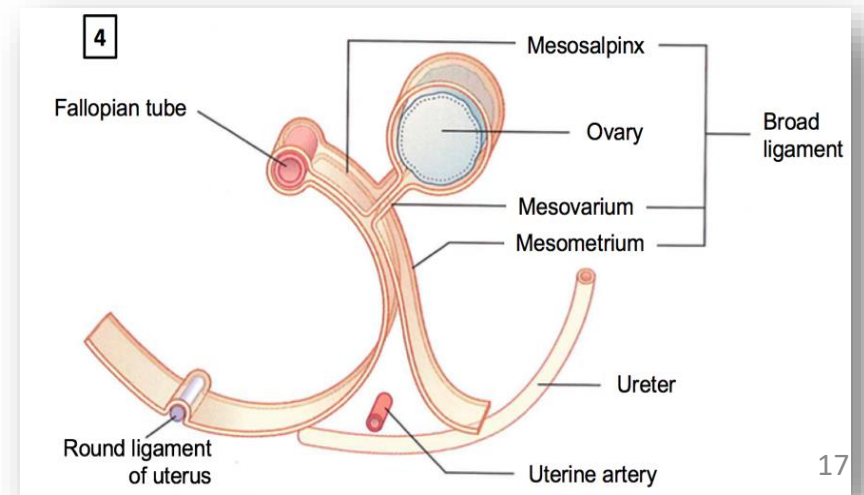
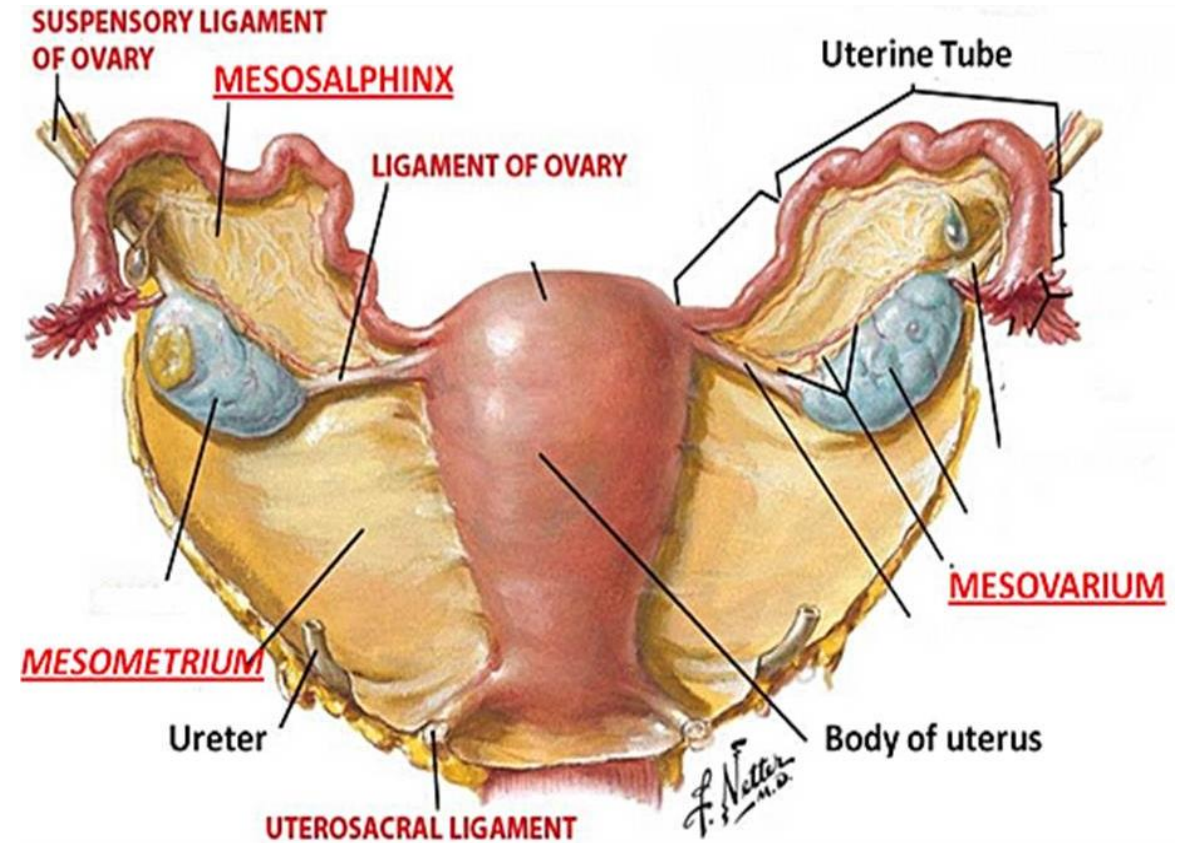
**a-Mesosalpinx.**

**b-Mesometrium:**

- It is the largest part of the broad ligament, and extends from the pelvic floor to the ovarian ligament and uterine body.

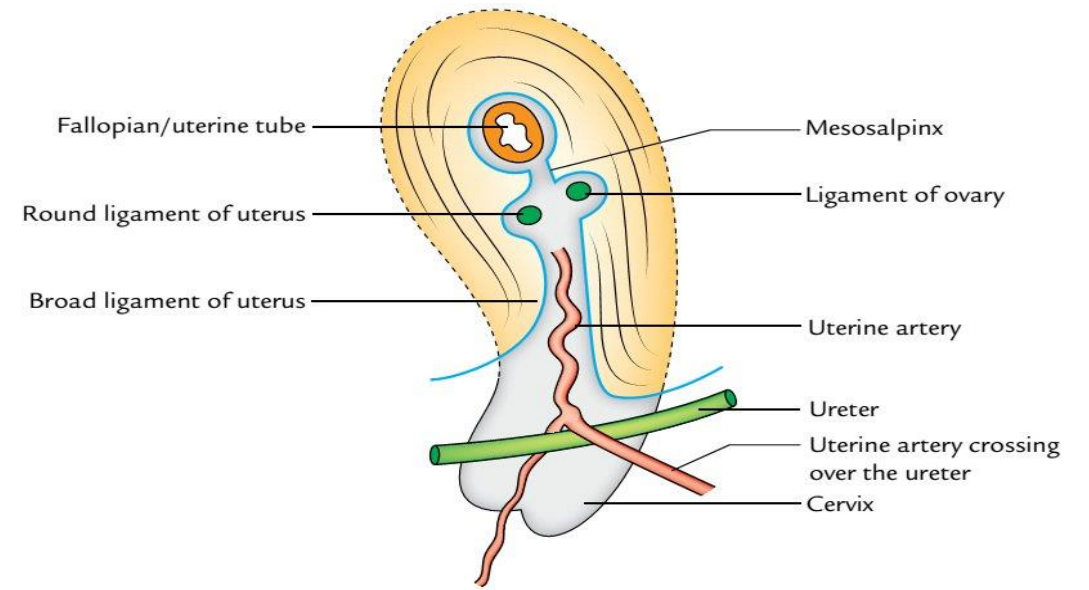
**c-Mesovarium.**

**d-Suspensory ligament of the ovary.**

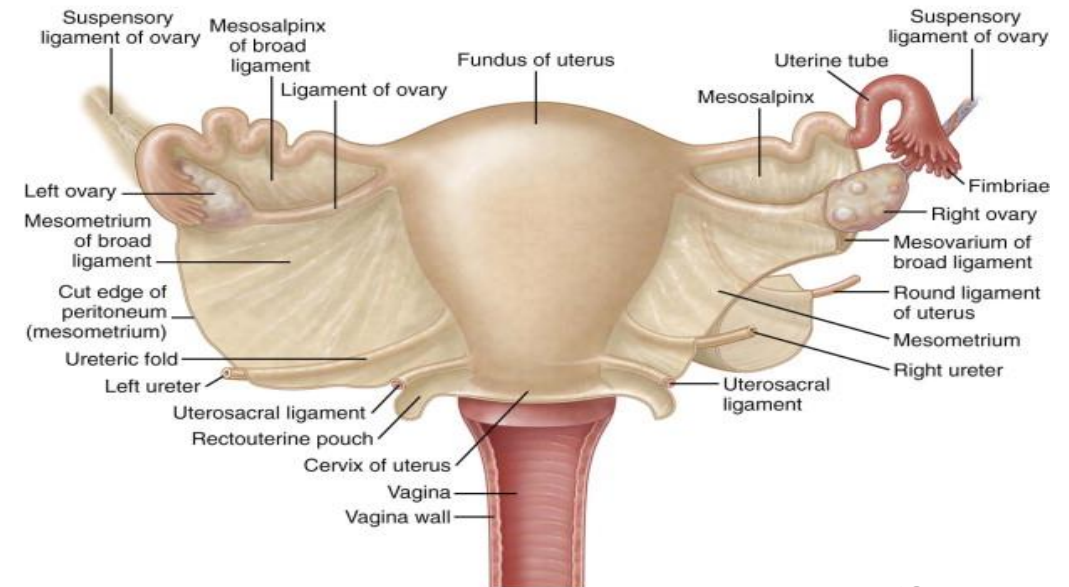


## Contents of broad ligaments:

- 1- Uterine tube.
- 2- Ureter.
- 3- Uterine vessels
- 4- Terminal part of the ovarian vessels.
- 5- Round ligament of the uterus.
- 6- Ligament of the ovary.
- 7- Autonomic fibers
- 8- Lymphatics.



sagittal section through the broad ligament of the uterus  
showing structures that lie within the broad ligament.



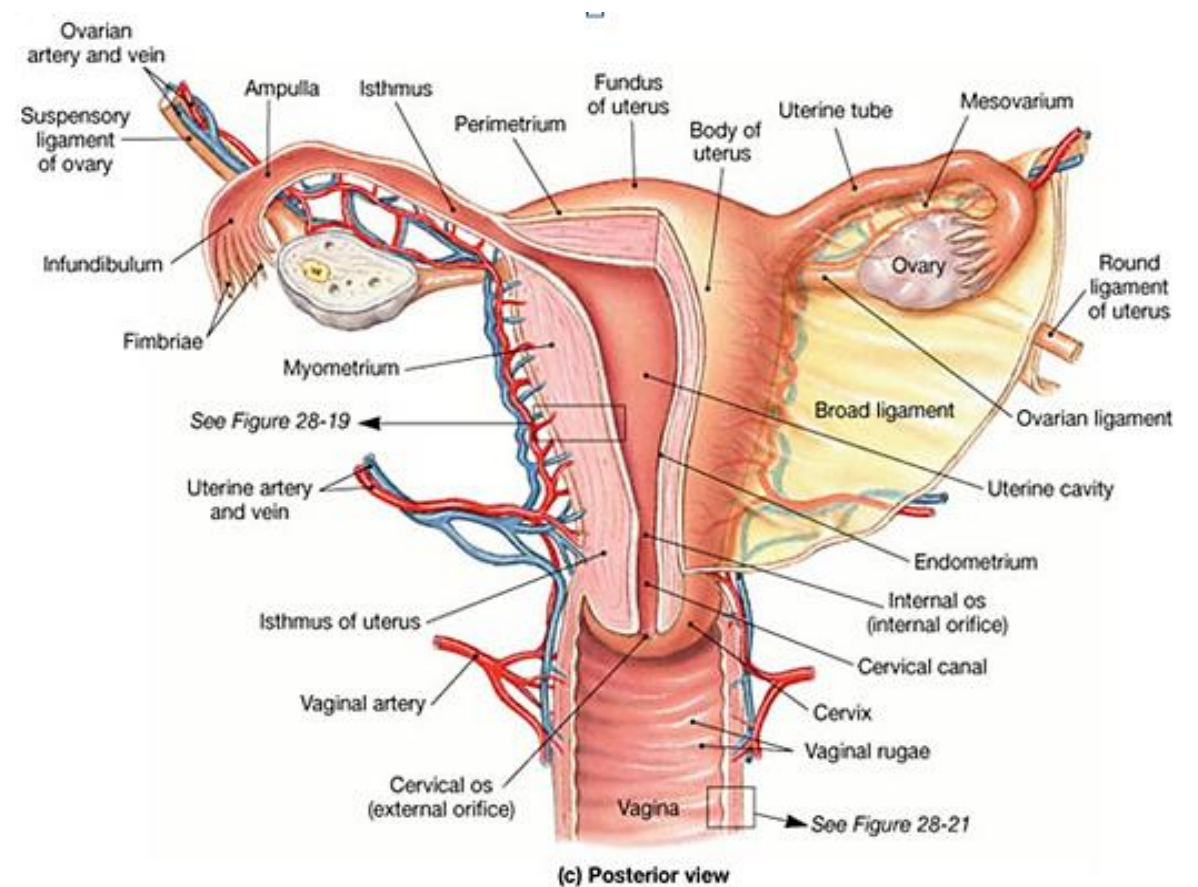
Uterus and broad ligament (posterior view)



## Arterial supply of uterus:

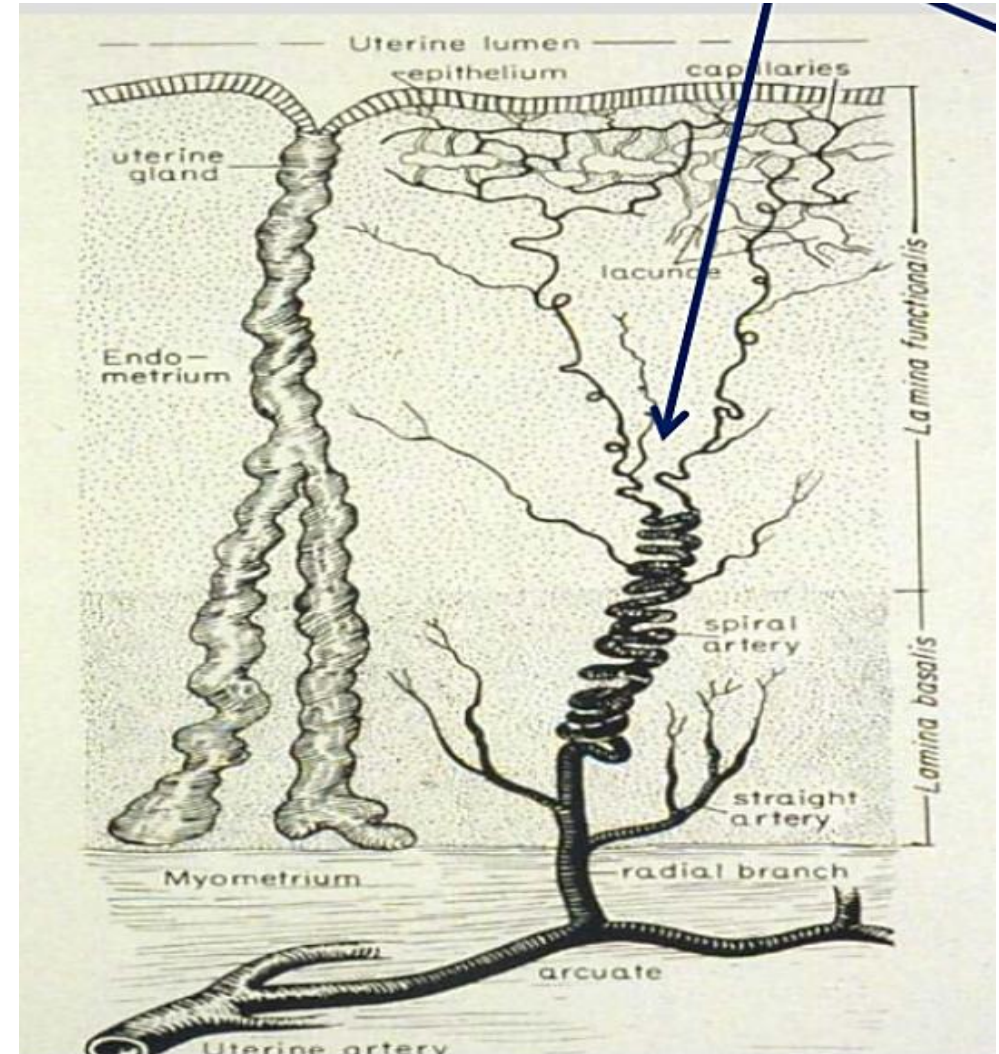
### **The uterine artery:**

- It is a branch from of internal iliac artery.
- It **passes** medially in the root of the broad ligament.
- Then, **it ascends** along the lateral border of uterus in a tortuous course.
- It **turns laterally** below the uterine tube and **ends by** anastomosing with the ovarian artery.
- **It supplies** the uterus, medial part of uterine tube, ovary &vagina.



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- Uterine arteries give off branches called **arcuate arteries** that are arranged in a circular fashion in the myometrium. These arteries branch into **radial arteries** that penetrate deeply into the myometrium.
- The radial artery give two kinds of arterioles:
  - **Straight arterioles** supply the stratum basalis of endometrium with the materials needed to regenerate the stratum functionalis.
  - **Spiral arterioles** supply the stratum functionalis of endometrium and change markedly during the menstrual cycle.



## Venous drainage of uterus:

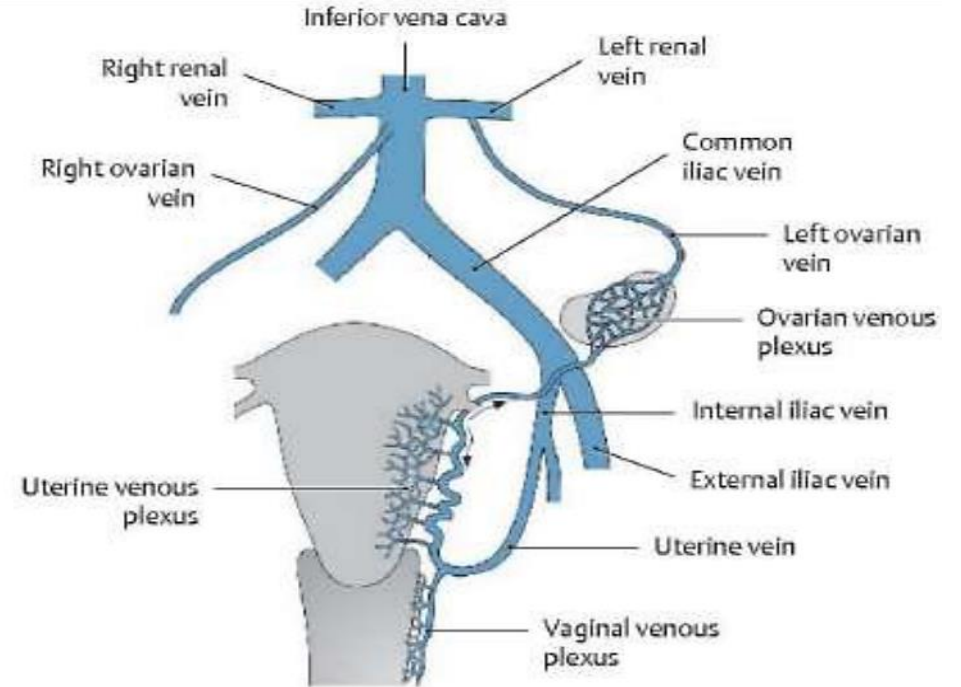
- The uterine veins extend laterally in the broad ligaments.

## Lymphatic drainage:

- **External and internal iliac nodes.**
- Lymphatics of the region at the junction of the uterus with uterine tube pass along the round ligament of the uterus to drain into the **superficial inguinal lymph nodes.**

## Nerve supply of uterus:

- **Sympathetic fibers:** from the last thoracic and first lumbar spinal segments.
- **Parasympathetic fibers:** pelvic splanchnic nerve





# Vagina

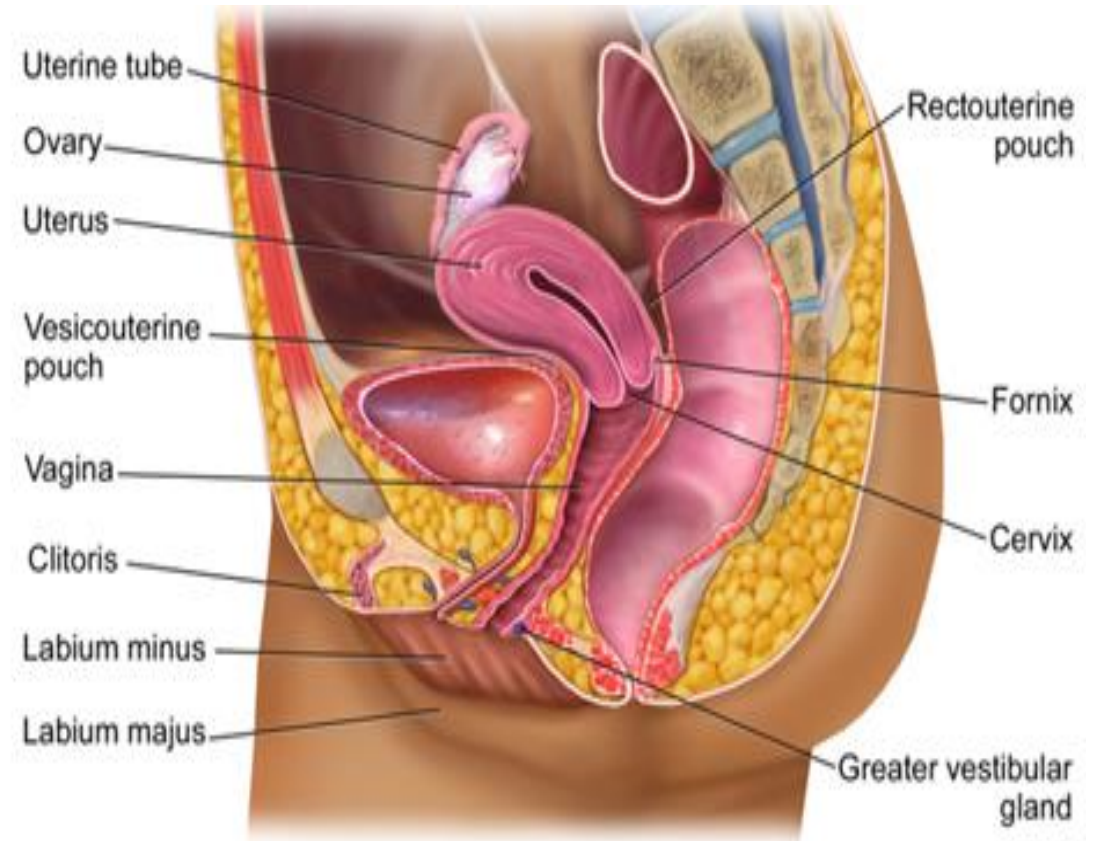
The vagina is fibromuscular canal.

## Site:

- It extends from vestibule of vulva below to the cervix of uterus above.
- It opens externally via vaginal orifice (introitus) within the vestibule positioned below & behind the external urethral orifice.
- The lower end of the vagina is closed by a perforated membrane; the hymen in virgin.

## Length:

- The anterior wall is about 7.5 cm.
- The posterior wall is 9 cm.

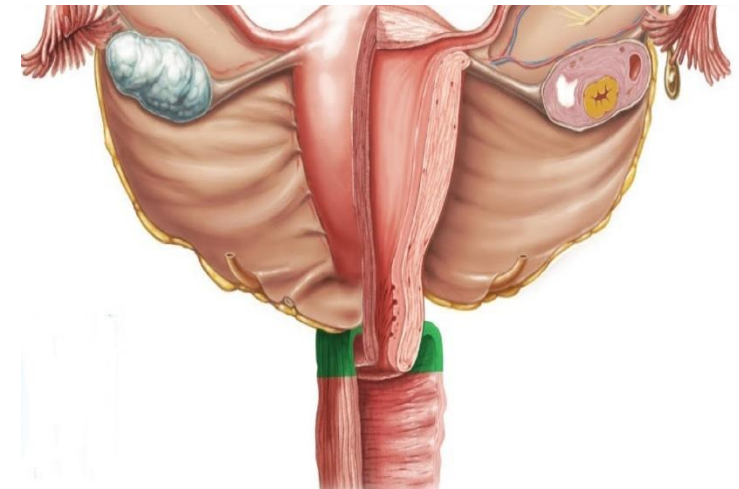
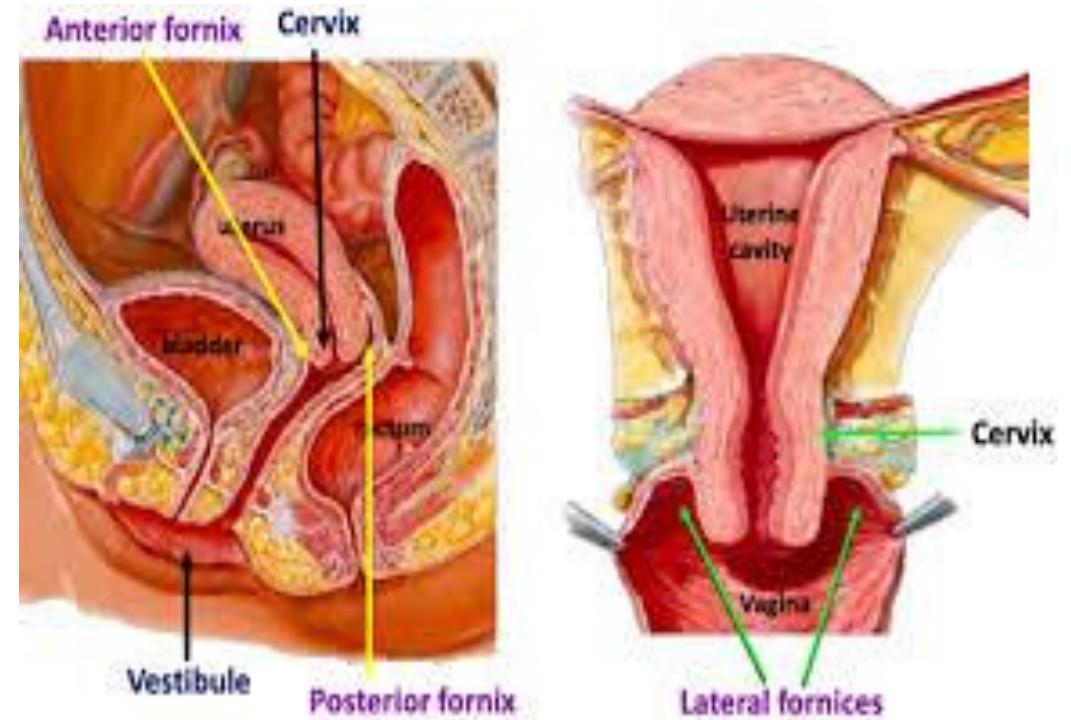


## Course of vagina:

- It courses upwards and slightly backwards.
- The cervix projects into the uppermost part of the anterior wall of vagina.
- **Fornices of vagina:** They are annular recess formed between the margin of the cervix and the vaginal wall.

It is subdivided into:

- a- **Anterior fornix:** Recess in front of the cervix
- b- **Posterior fornix:** Recess behind the cervix
- c- **Lateral fornices :** Two recesses one on each side of the cervix.





## Relations of Vagina:

The structures felt through the vaginal wall are:

### 1- The anterior wall:

- It is related to; Base of the urinary bladder & the urethra.

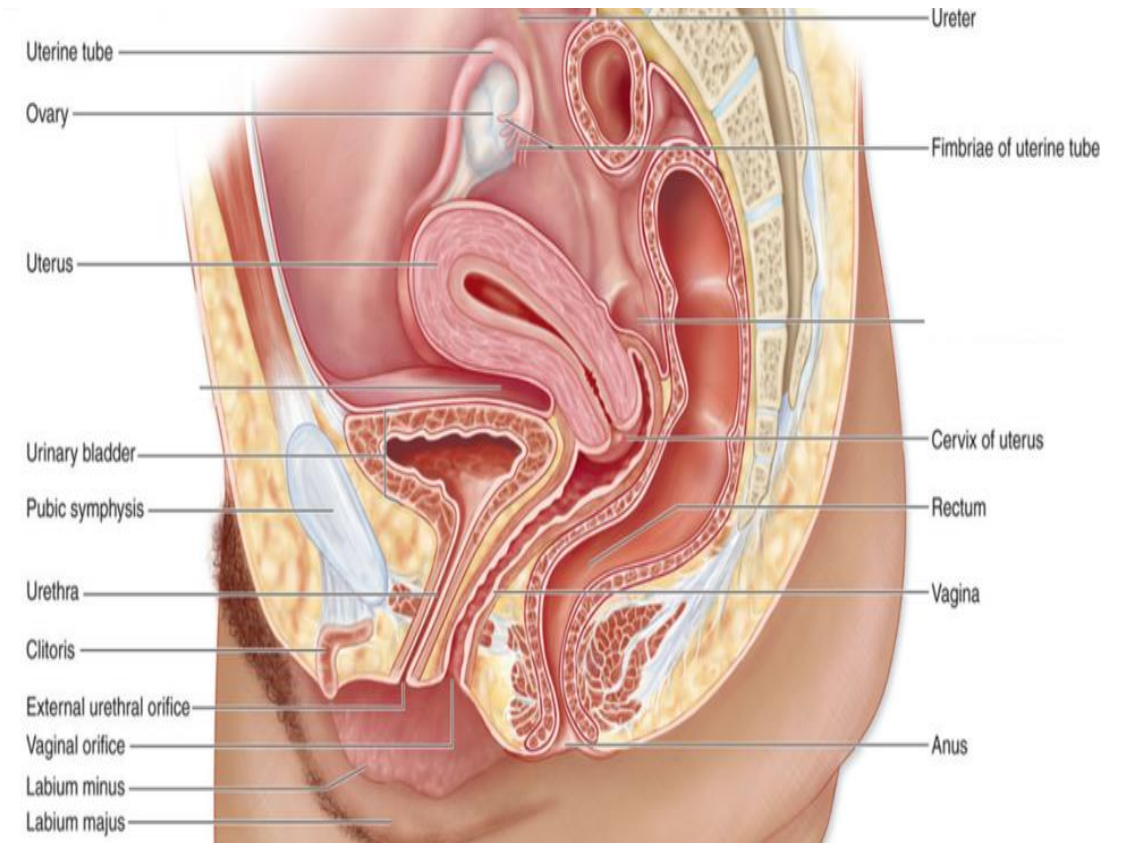
### 2- The posterior wall of the vagina:

It is related to:

- **Its upper fourth;** Rectouterine pouch.
- **Its middle two fourths;** Rectum.
- **Its lower fourth;** Perineal body which separates it from the anal canal.

### 3- Laterally:

- Sphincter vaginae



### Arterial supply of vagina:

- It is derived from **the vaginal arteries** which form two median longitudinal vessels (anterior and posterior), the azygos arteries.

### Venous drainage:

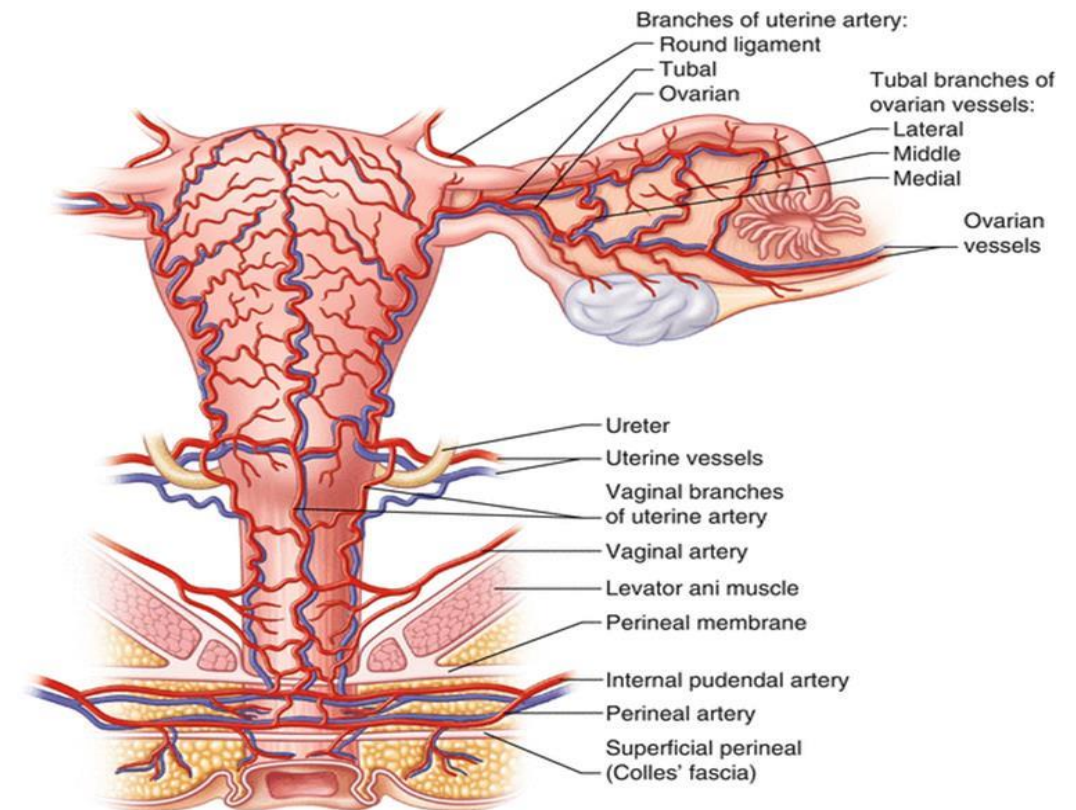
- The vaginal veins, one on each side, that connect with uterine vein.

### Lymphatic drainage:

- Drains into internal & external iliac lymph nodes.
- The lower part into the superficial inguinal lymph nodes.

### Nerve supply:

- It is supplied by sympathetic and parasympathetic fibers.
- Its lower part is supplied by the pudendal nerves.



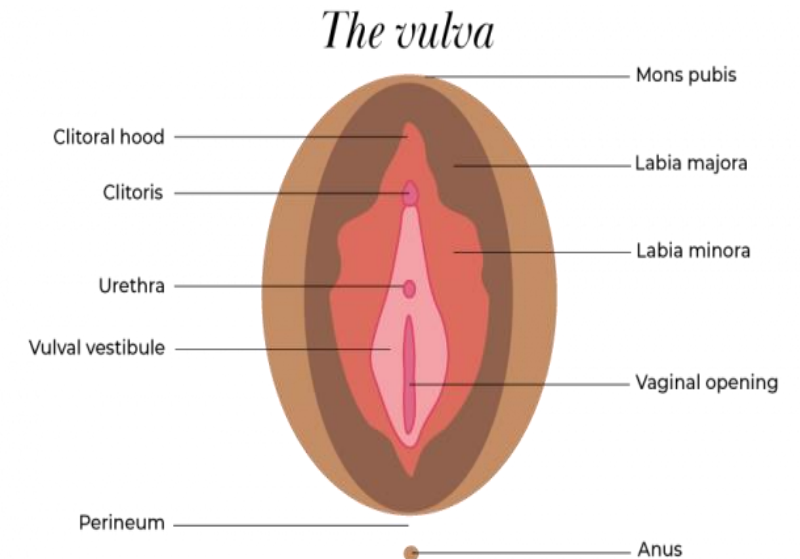
# Female External Genital Organs

## The labia majora:

- They are two broad skin folds, lateral to the labia minora.
- Unite anteriorly to form the mons pubis.
- Posteriorly, they do not join. The connecting skin between them posteriorly forms posterior commissure.

## The labia minora:

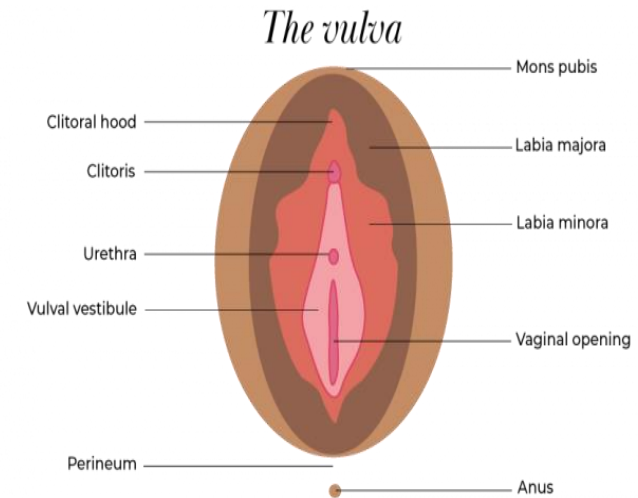
- They are two thin skin folds devoid of pubic hair.
- **The region between the labia minora is the vestibule. Within the vestibule are the vaginal orifice, the external urethral orifice, and the openings of the ducts of glands.**



- The ducts of the para-urethral glands open into the vestibule, one on each side of the urethral orifice.
- The ducts of the greater vestibular (Bartholin's) glands open in the vestibule adjacent to the posterolateral margin of the vaginal orifice.

### The clitoris:

- It is a small cylindrical mass of erectile tissue and nerves located at the anterior junction of the labia minora.
- It is formed of two corpora cavernosa that form the body of the clitoris.
- The corpora cavernosa are continuous behind with the crura of the clitoris which form the root of clitoris.
- The clitoris ends in a rounded small tubercle; called the glans clitoris.







**Thank  
you**