

ANATOMY OF THE FEMALE REPRODUCTIVE SYSTEM

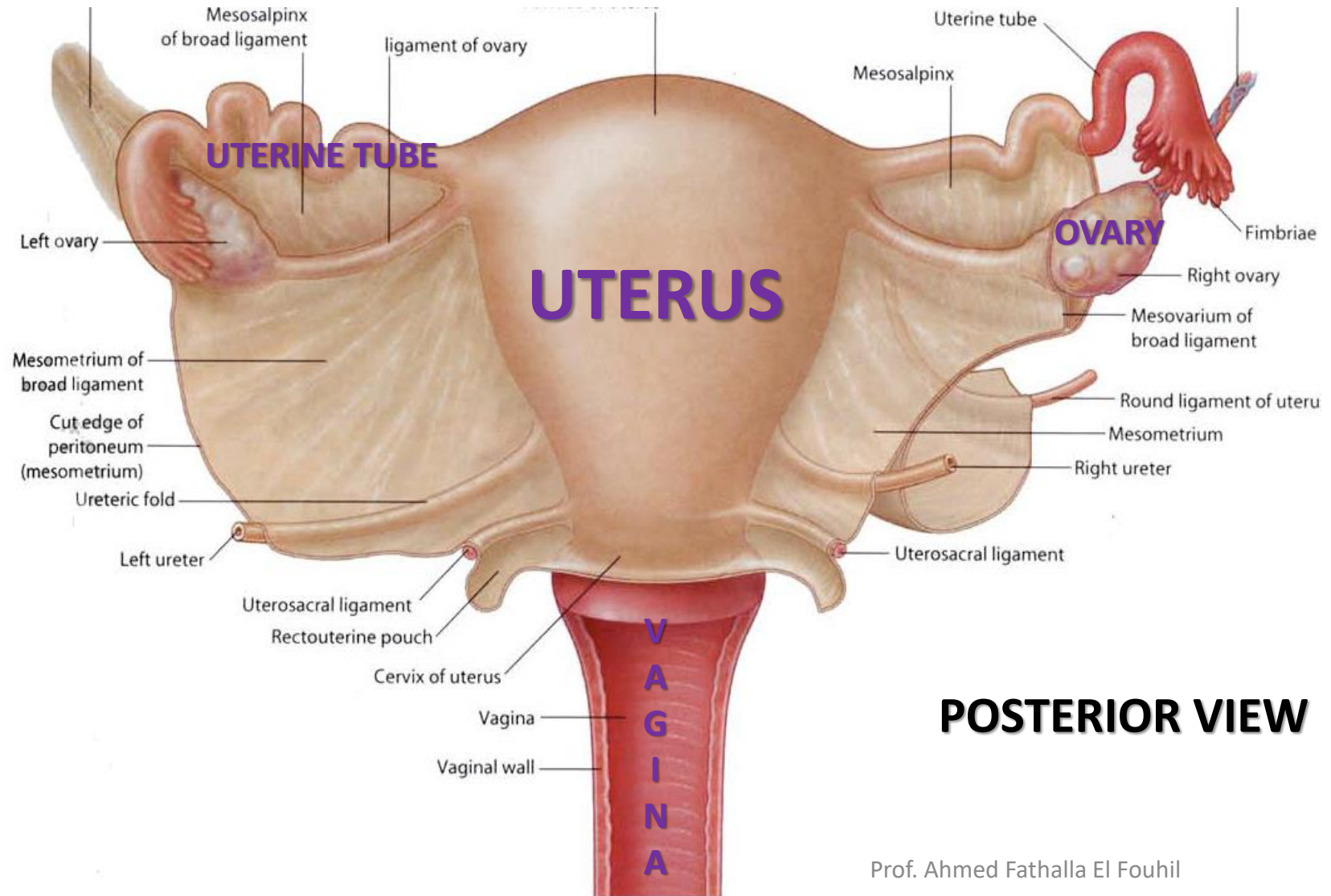
***Prof. Ahmed Fathalla Ibrahim El Fouhil
Professor of Anatomy
College of Medicine
King Saud University
E-mail: ahmedfathala@gmail.com***

OBJECTIVES

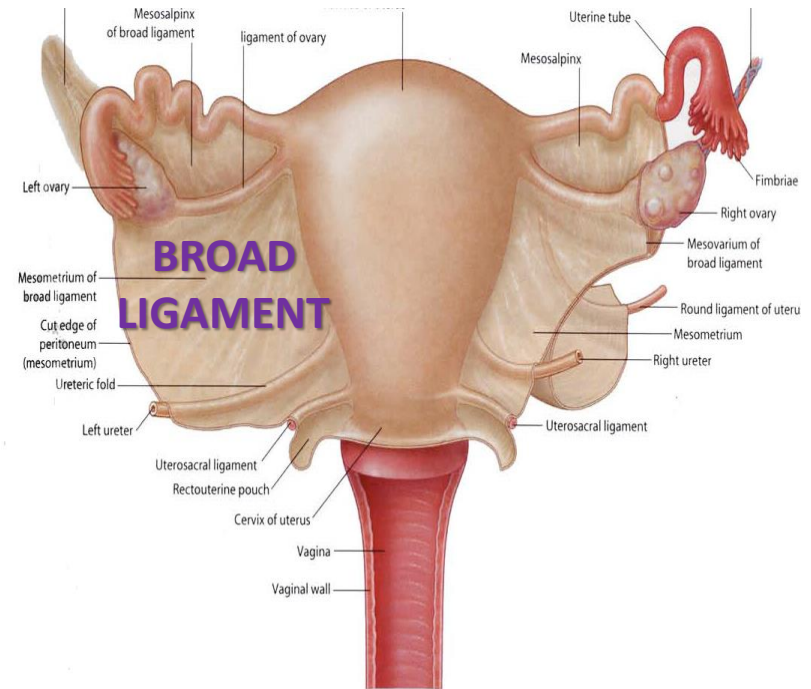
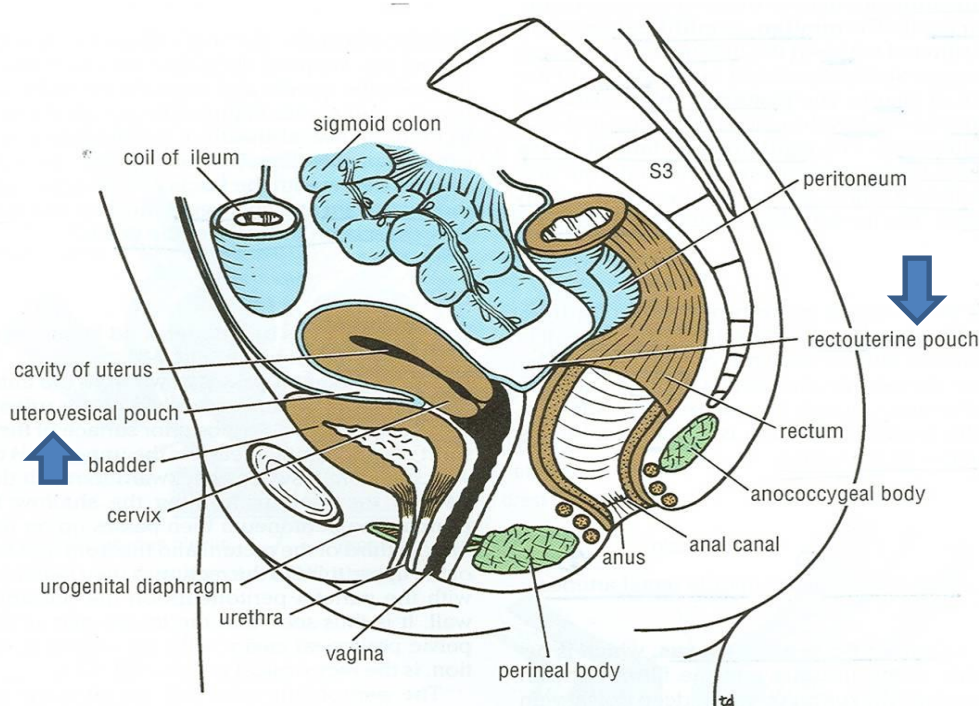
At the end of the lecture, students should:

- *List the organs of female reproductive system.*
- *Describe the pelvic peritoneum in female.*
- *Describe the position and relations of the **ovaries**.*
- *List the parts of the **uterine tube**.*
- *Describe the anatomy of **uterus** regarding: subdivisions, cavity, relations, ligaments & main support.*
- *Describe the anatomy of **vagina** regarding: structure, extent, length & relations.*
- *Describe the **supply (arteries, veins, lymph, nerves)** of female reproductive system.*

FEMALE REPRODUCTIVE SYSTEM

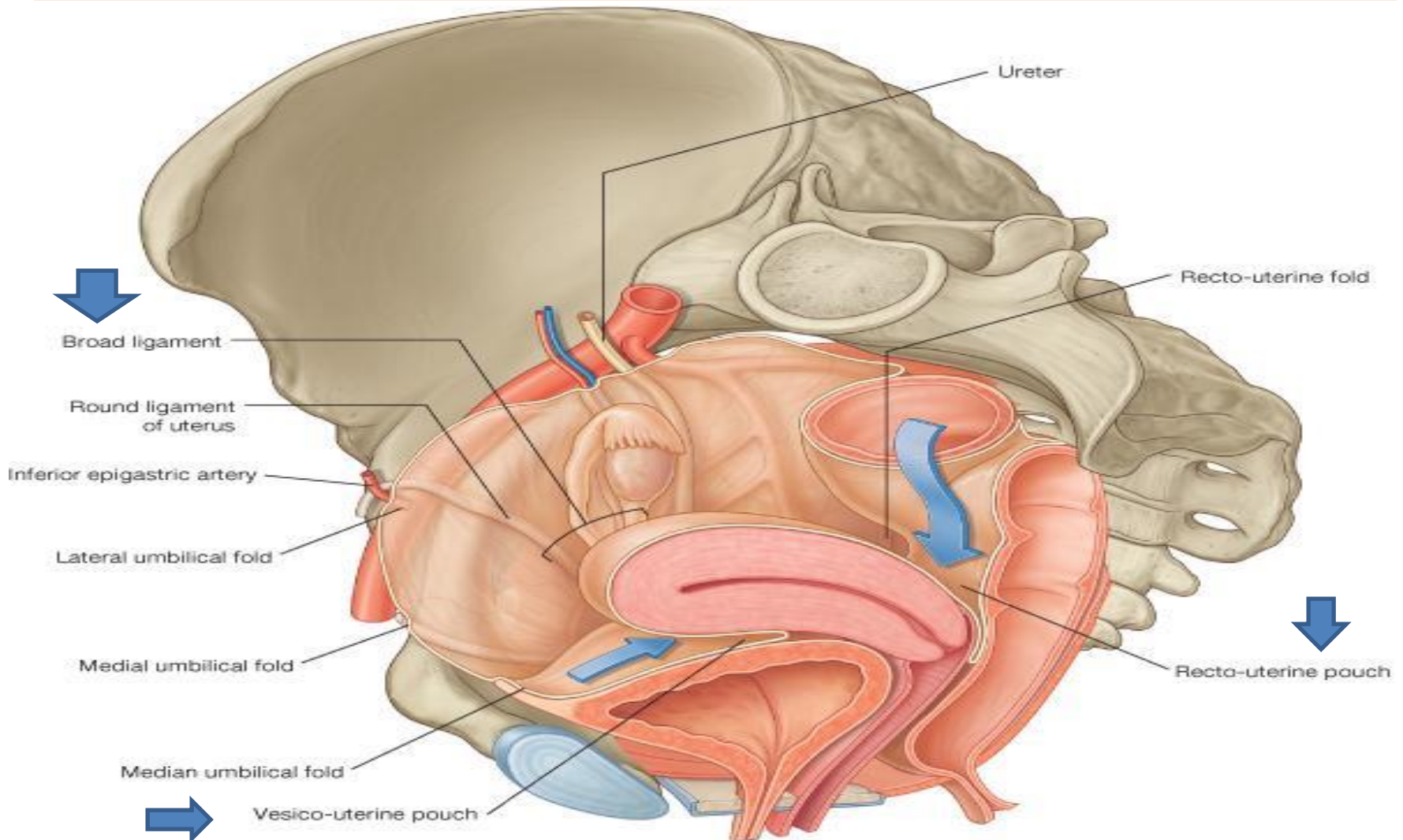


PELVIC PERITONEUM IN FEMALE

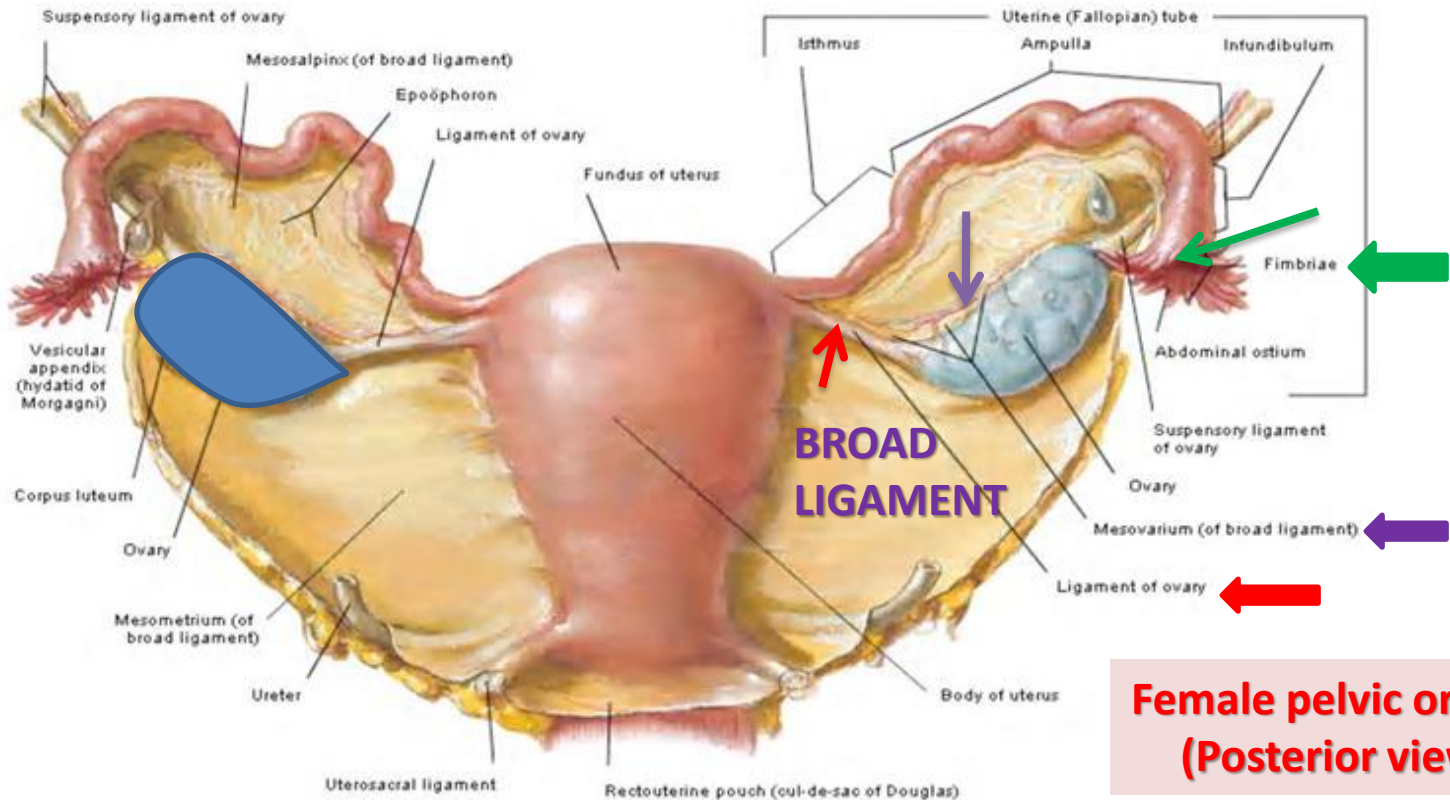


- ❑ **Rectouterine (Douglas) pouch:** Reflection of peritoneum from rectum to upper part of posterior surface of vagina
- ❑ **Uterovesical (vesicouterine) pouch:** Reflection of peritoneum from uterus to upper surface of urinary bladder
- ❑ **Broad ligament of uterus:** Extension of peritoneum from lateral wall of uterus to lateral wall of pelvis, encloses the uterine tubes

PELVIC PERITONEUM IN FEMALE

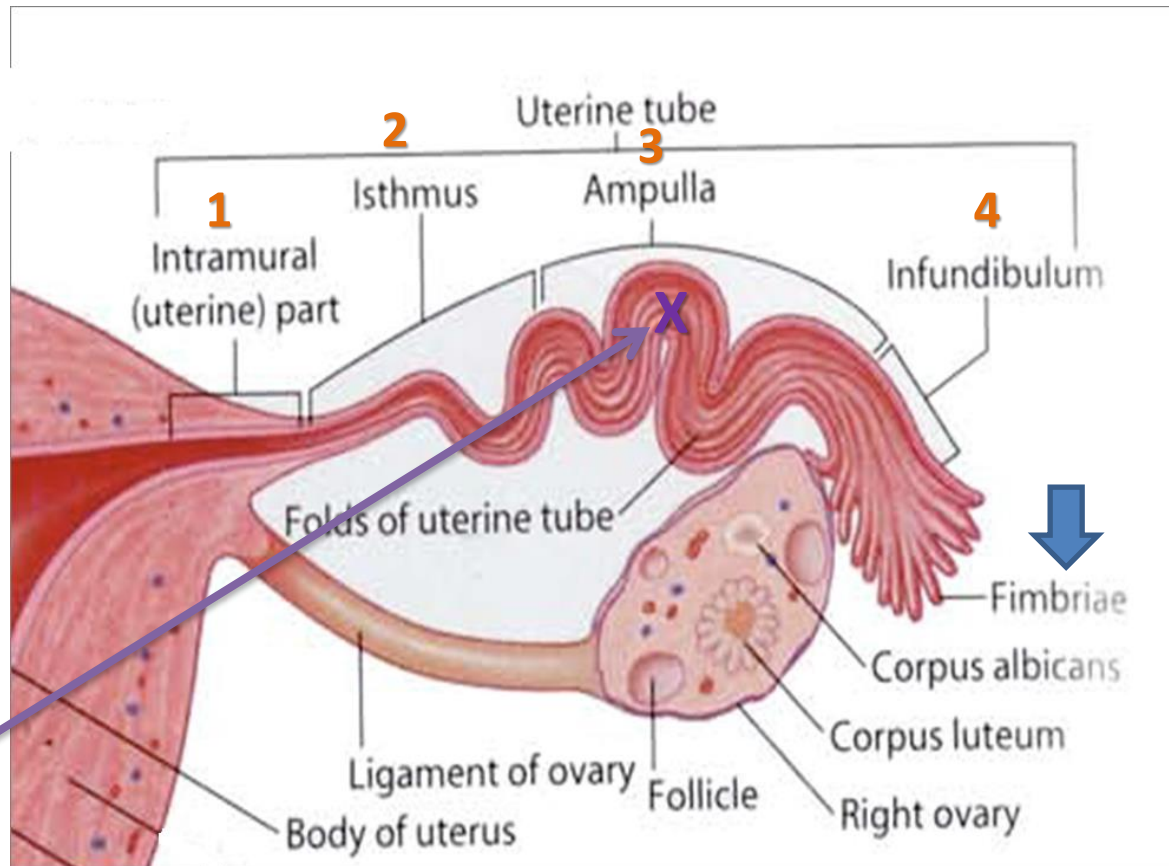


THE OVARIES



- ❑ It is an almond-shaped organ.
- ❑ It is attached to the back of the broad ligament by a peritoneal fold (**mesovarium**)
- ❑ Its medial end is attached to uterus by **ligament of ovary**.
- ❑ Its lateral end is related to the **fimbriae of the uterine tube**.

THE UTERINE (FALLOPIAN) TUBES



❑ It is 10 cm long.

❑ It is enclosed in the broad ligament of uterus.

❑ It is divided into:

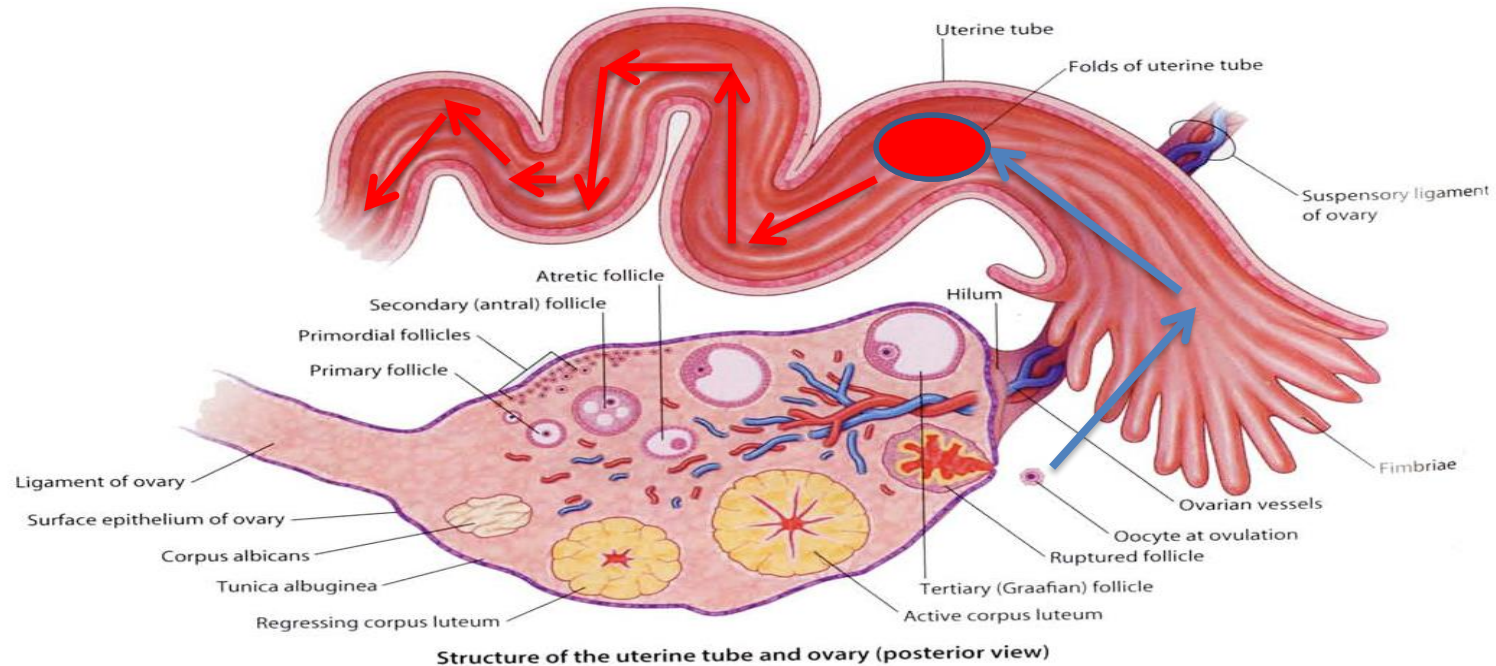
❑ **1) Intramural part:** opening into the uterine wall

2) Isthmus: narrowest part

3) Ampulla: widest part (site of fertilization)

4) Infundibulum: funnel-shaped end, has finger-like processes (fimbriae), related to ovary

FUNCTION OF:



❑ OVARIES: PRIMARY SEX ORGANS IN FEMALE

- 1) Production of female germ cells
- 2) Secretion of female sex hormones

❑ UTERINE TUBES:

- 1) Site of fertilization
- 2) Transport of fertilized ovum into the uterus

THE UTERUS

□ A hollow, pear-shaped muscular organ

□ Divided into:

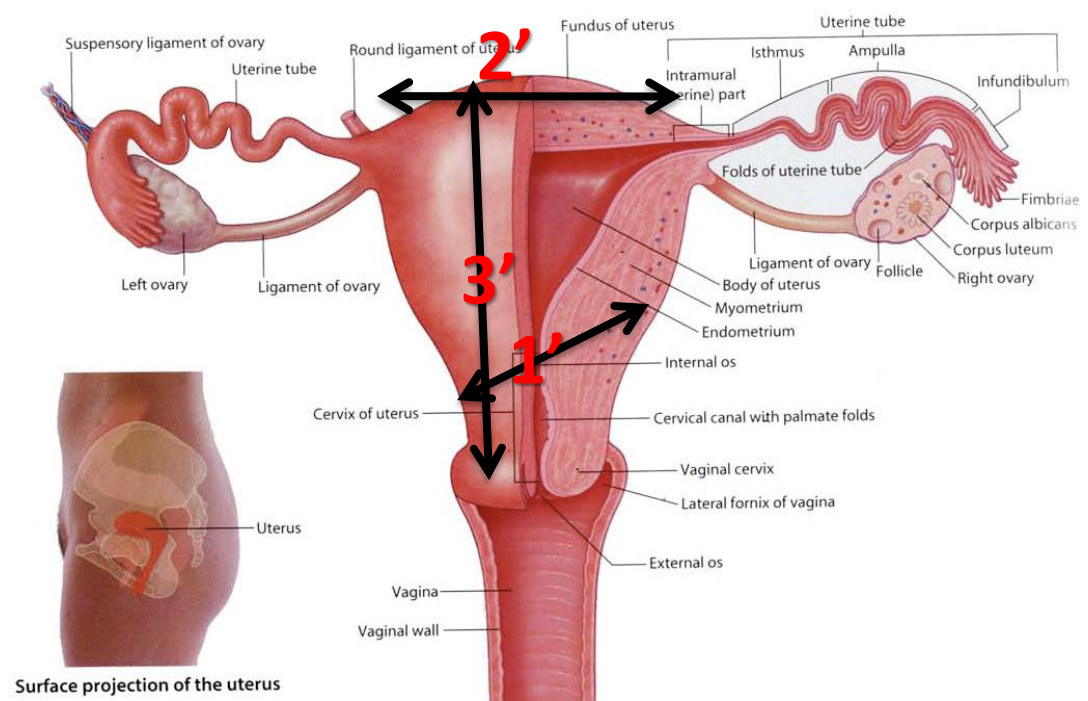
1. **Fundus:** no cavity

2. **Body:** cavity is triangular

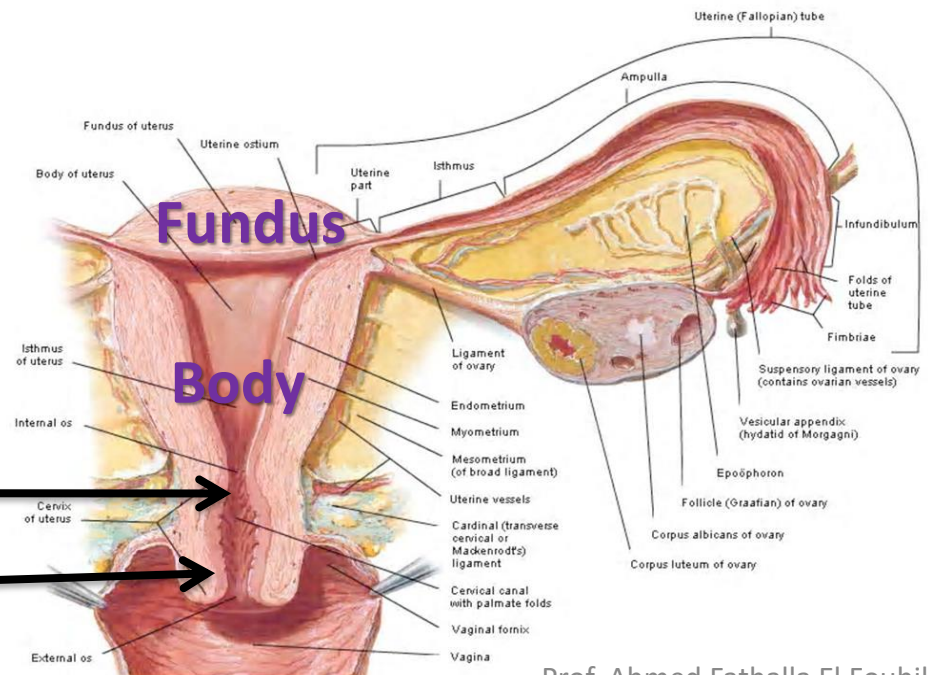
3. **Cervix:** cavity (cervical canal) is fusiform, divided into:

* **Supravaginal part**

* **Vaginal part**



Surface projection of the uterus

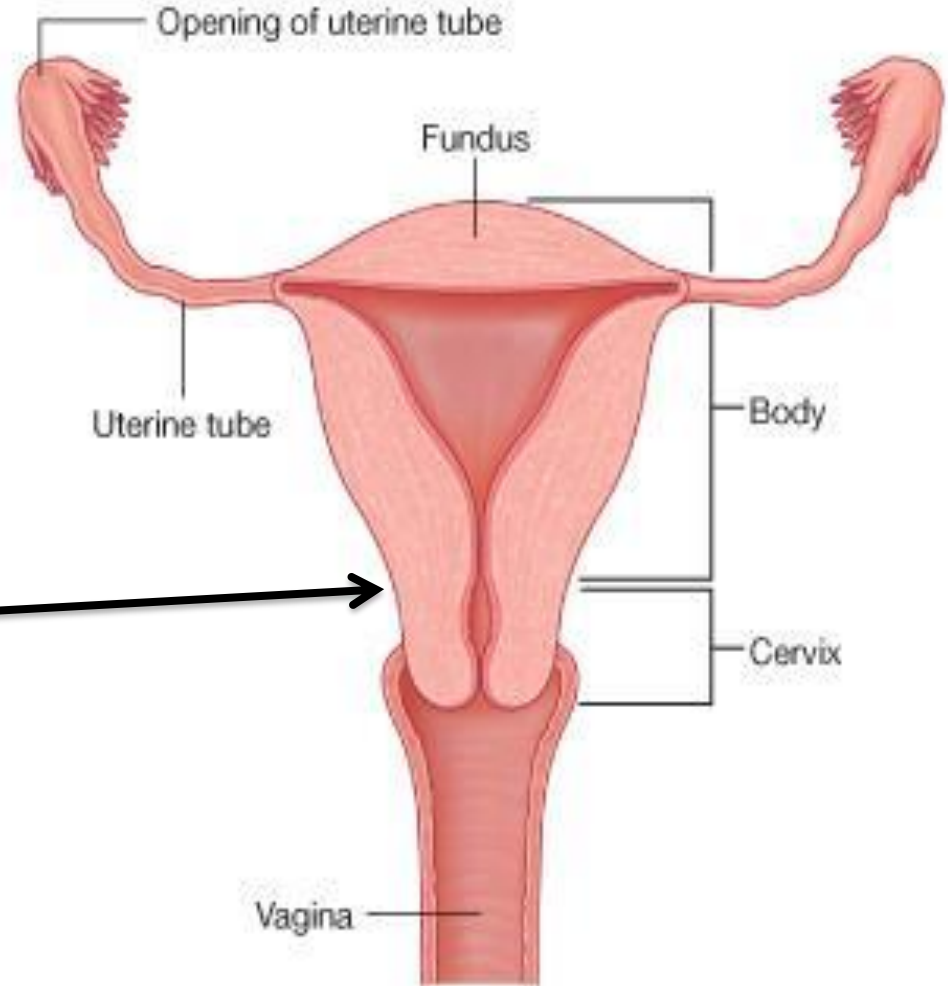


THE UTERUS

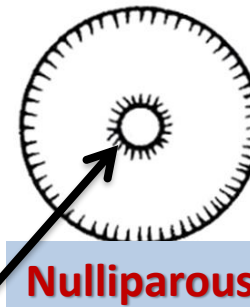
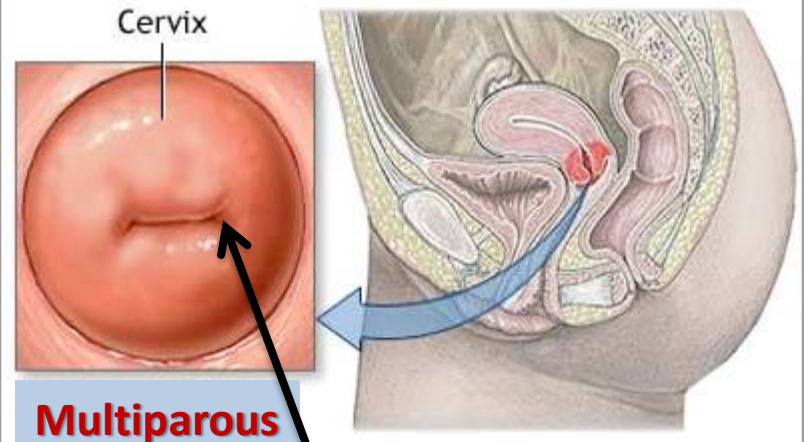
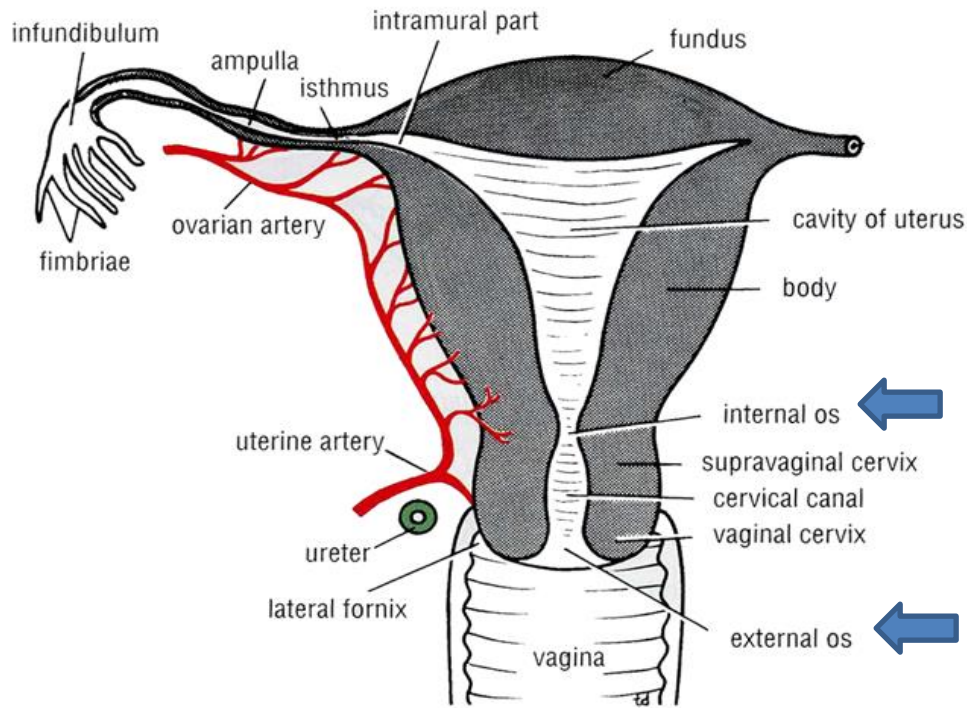
❑ **FUNDUS:** The part of uterus above the level of uterine tubes

❑ **BODY:** The part of uterus from the level of uterine tube to the level of the isthmus of uterus

❑ **CERVIX:** The part of the uterus below the level of the isthmus of the uterus

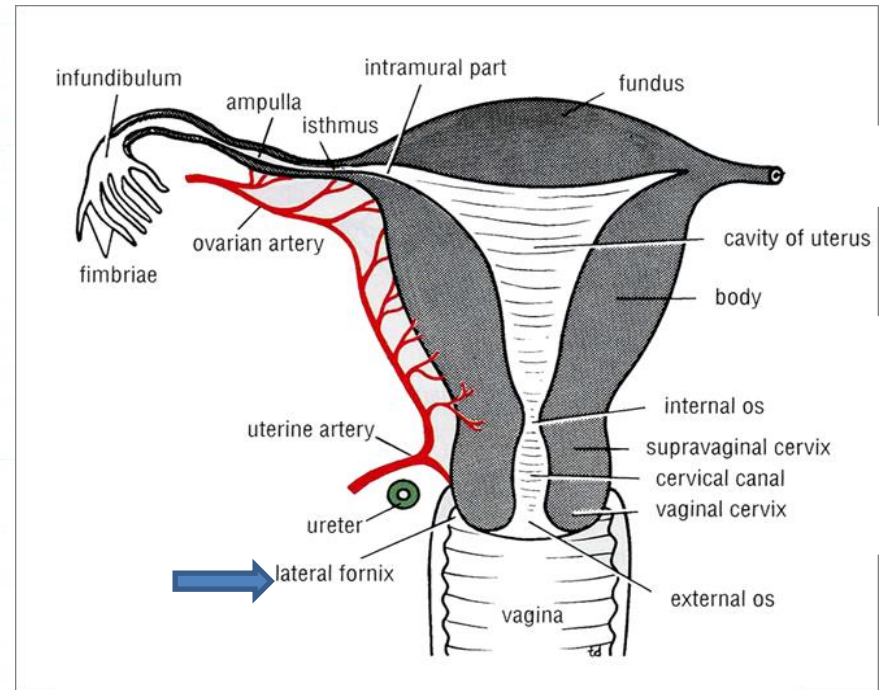
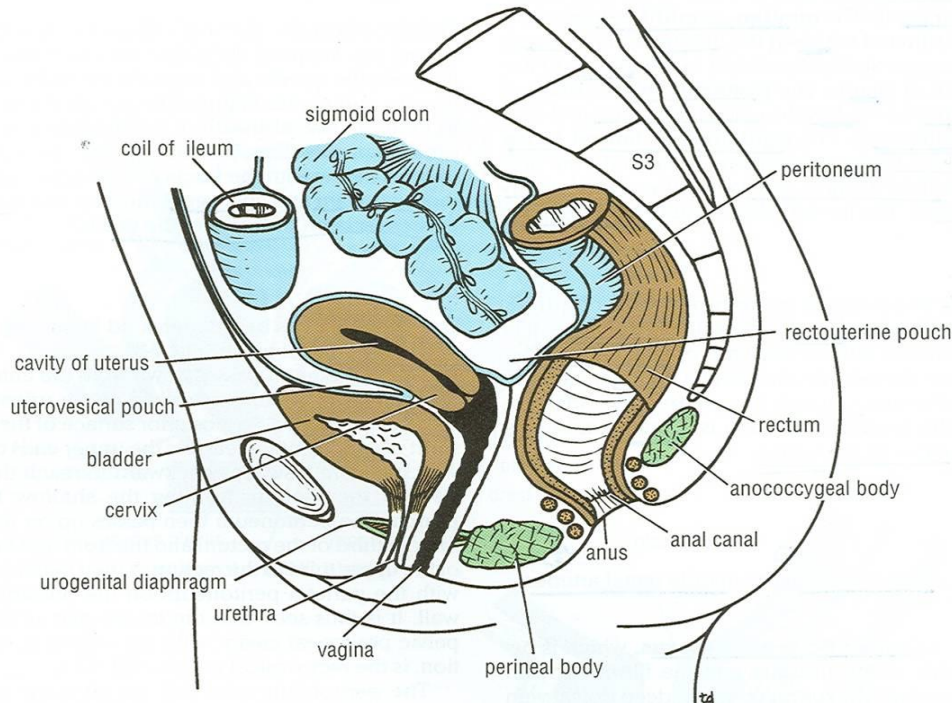


THE CERVICAL CANAL



- ❑ **INTERNAL OS:** opening between cavity of body of uterus & cavity of cervix (cervical canal)
- ❑ **EXTERNAL OS:** opening between cervical canal & cavity of vagina
- ❑ In a nulliparous woman: external os appears circular.
- ❑ In a multiparous woman: external os appears as a transverse slit with an anterior & a posterior lip.

RELATIONS OF UTERUS



❑ **FUNDUS + BODY + SUPRAVAGINAL PART OF CERVIX:**

1. **Anterior:** superior surface of urinary bladder
2. **Posterior:** sigmoid colon
3. **Lateral:** uterine artery

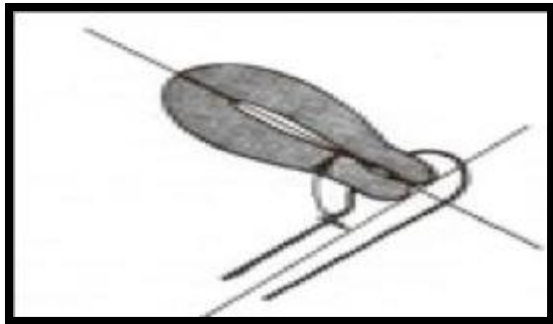
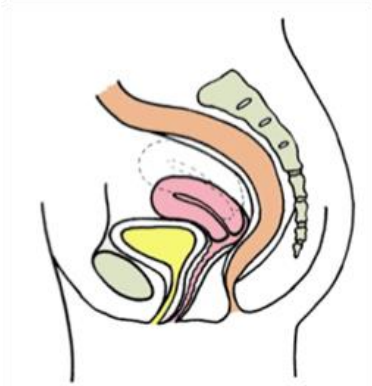
❑ **VAGINAL PART OF CERVIX:** surrounded by vaginal fornices

1. **Anterior:** anterior fornix of vagina
2. **Posterior:** posterior fornix of vagina
3. **Lateral:** lateral fornices of vagina

FUNCTION OF UTERUS

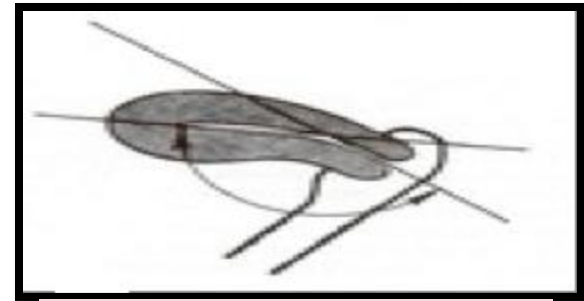
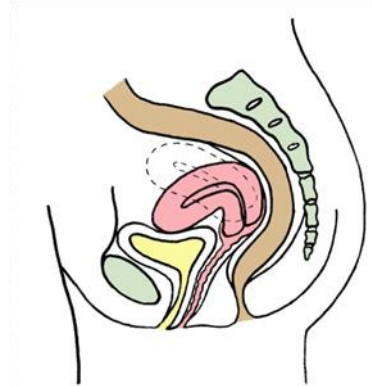


POSITIONS OF UTERUS



ANTEVERTED UTERUS

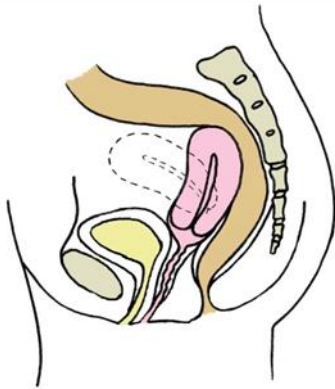
Long axis of whole uterus is bent forward on long axis of vagina



ANTEFLEXED UTERUS

Long axis of body of uterus is bent forward on long axis of cervix

POSITIONS OF UTERUS



RETROVERTED UTERUS

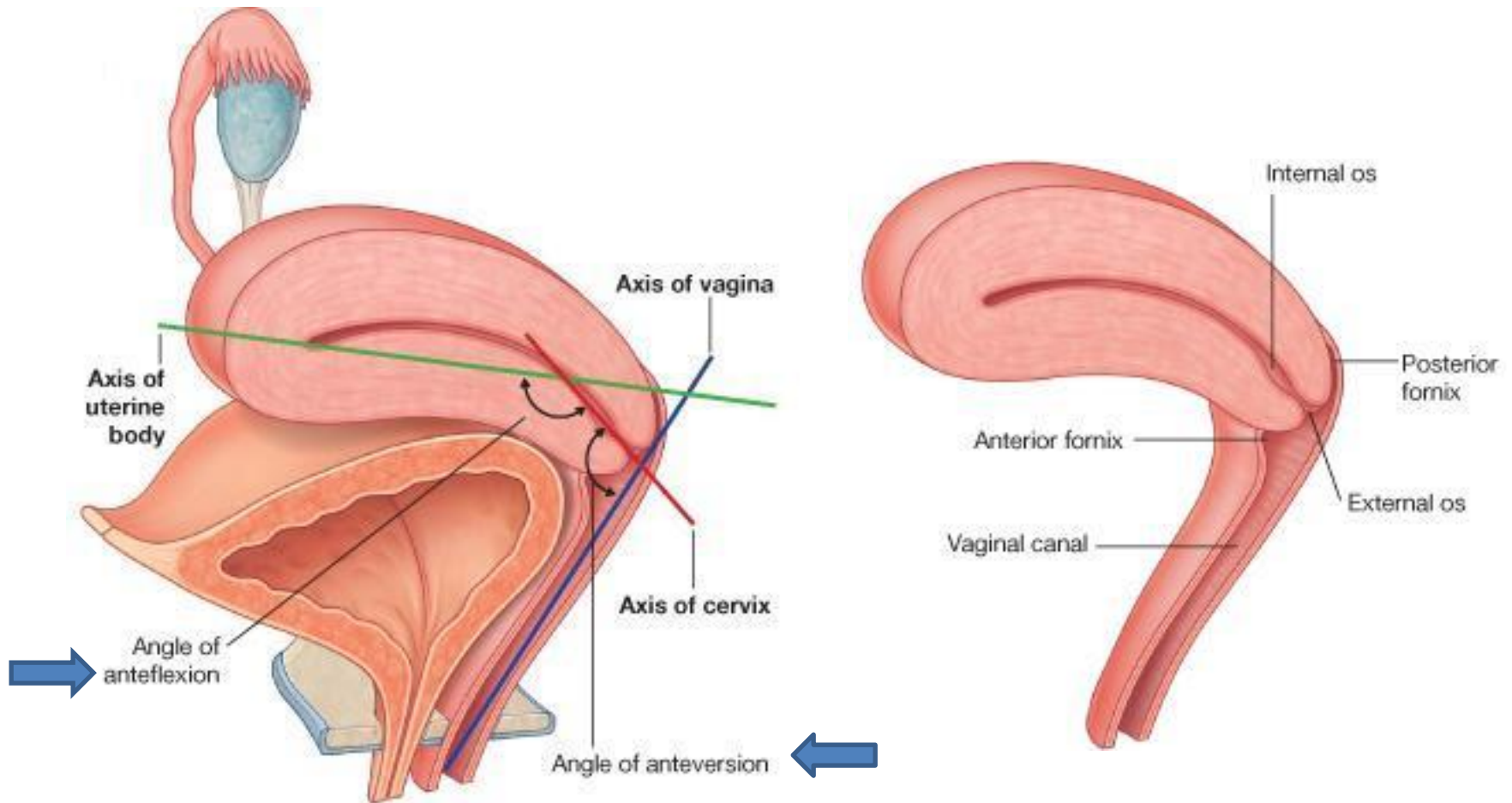
Fundus & body of uterus are bent backward on the vagina and lie in rectouterine pouch



RETROFLEXED UTERUS

Long axis of body of uterus is bent backward on long axis of cervix

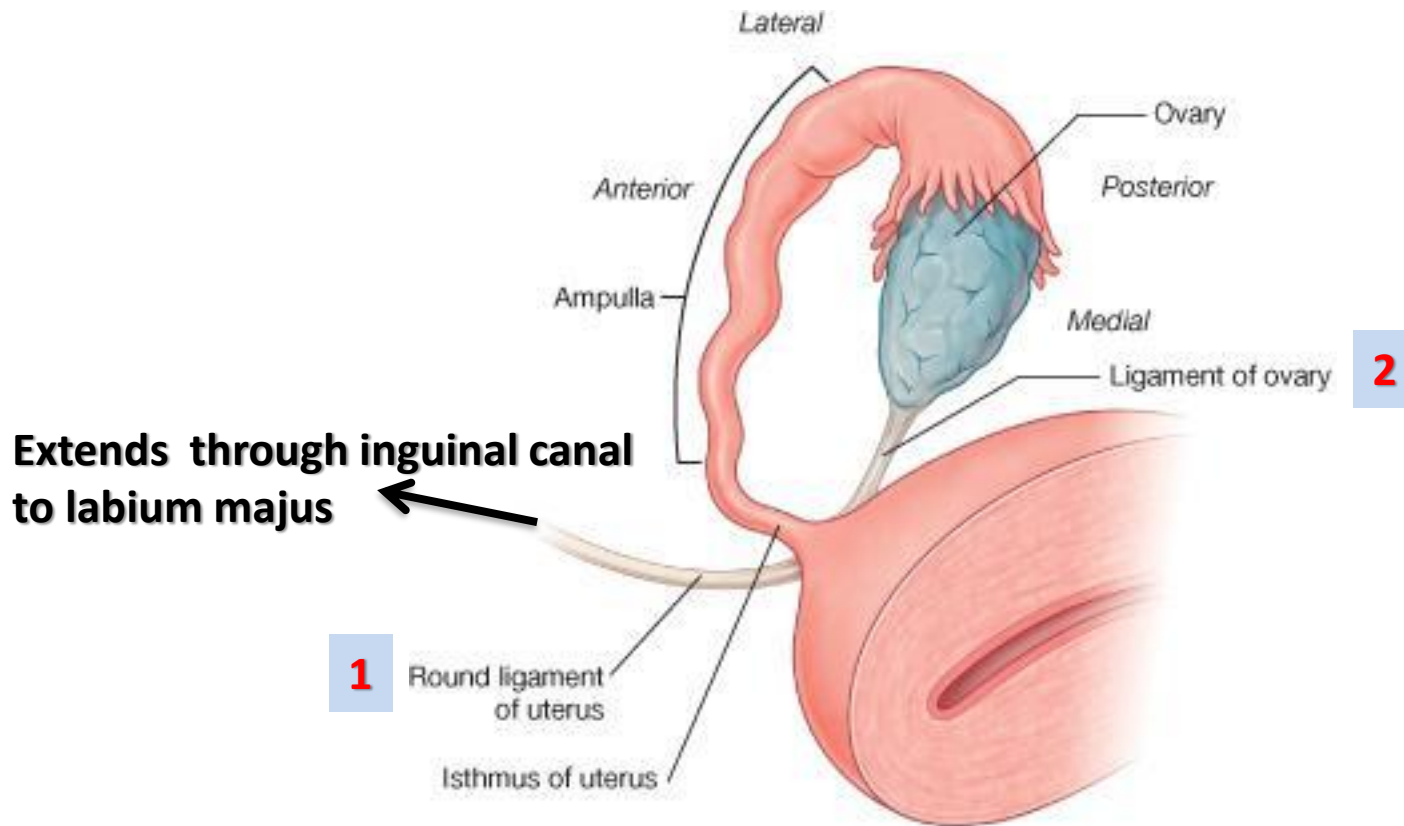
USUAL POSITION OF UTERUS



ANTEVERTED ANTEFLEXED UTERUS

LIGAMENTS OF UTERUS

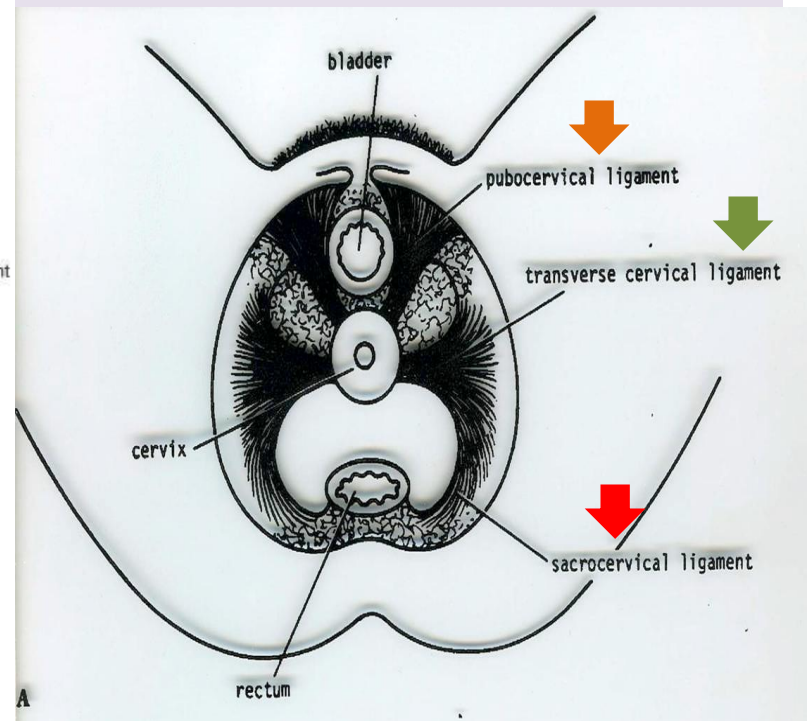
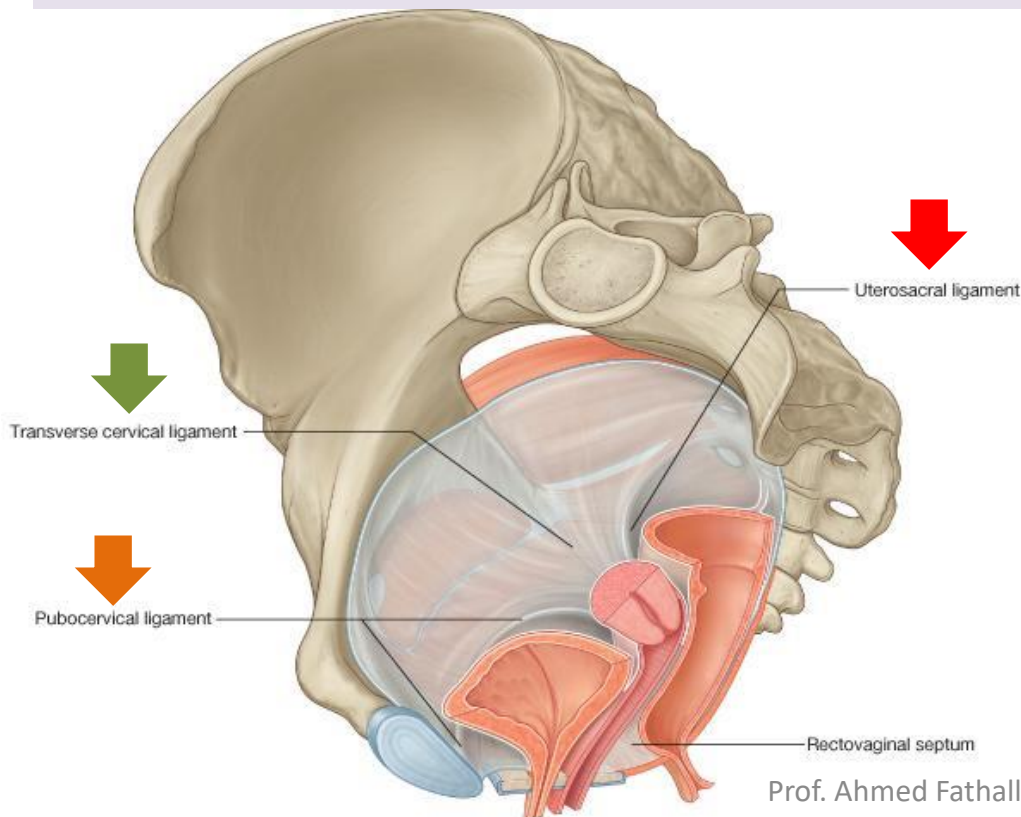
1) Ligaments at junction between fundus & body of uterus (At the level of uterine tube)



LIGAMENTS OF UTERUS

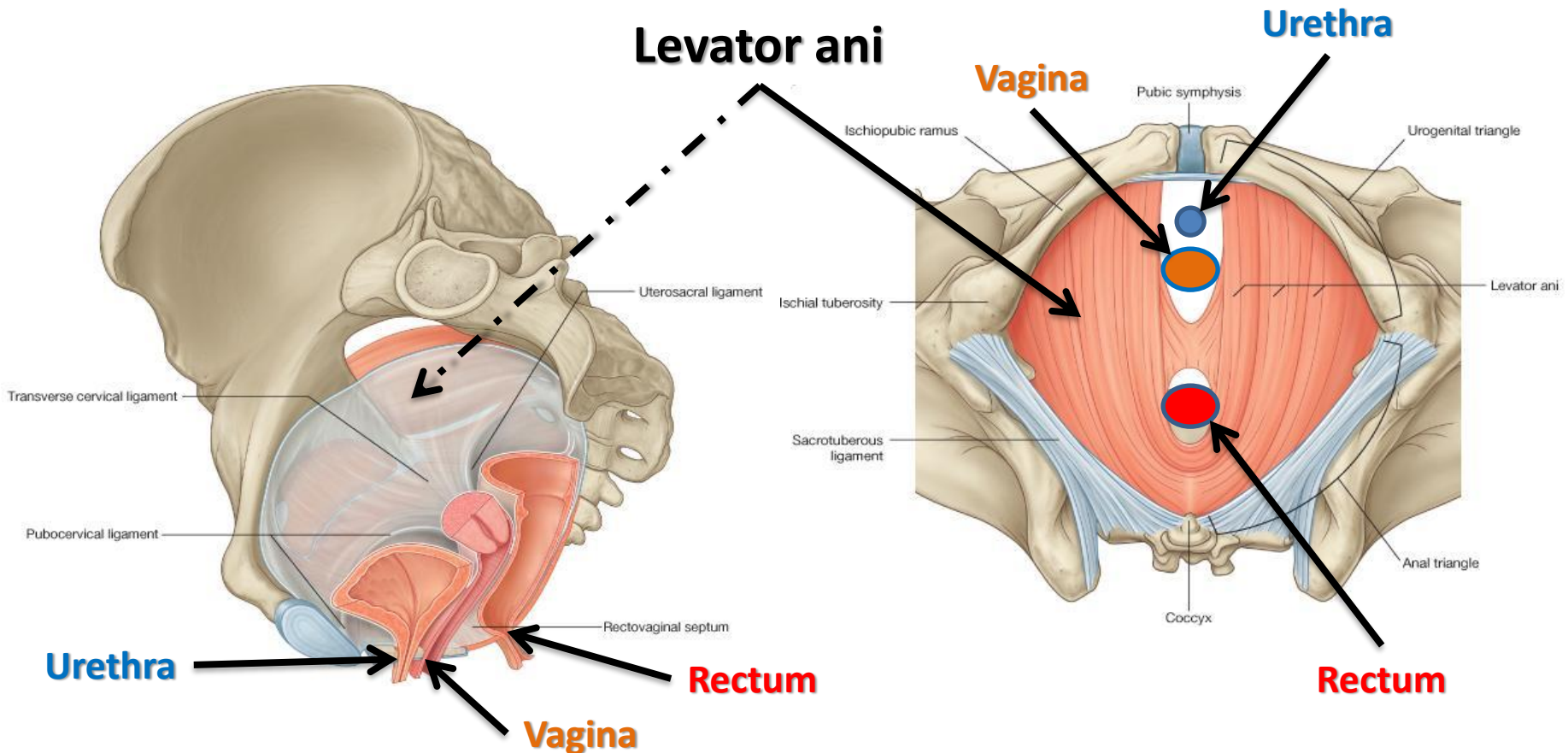
2) Ligaments of cervix

Extend from **cervix** to: **anterior (pubocervical)**,
pelvic walls **lateral (transverse cervical or cardinal)**
posterior (uterosacral or sacrocervical)



LEVATOR ANI MUSCLES

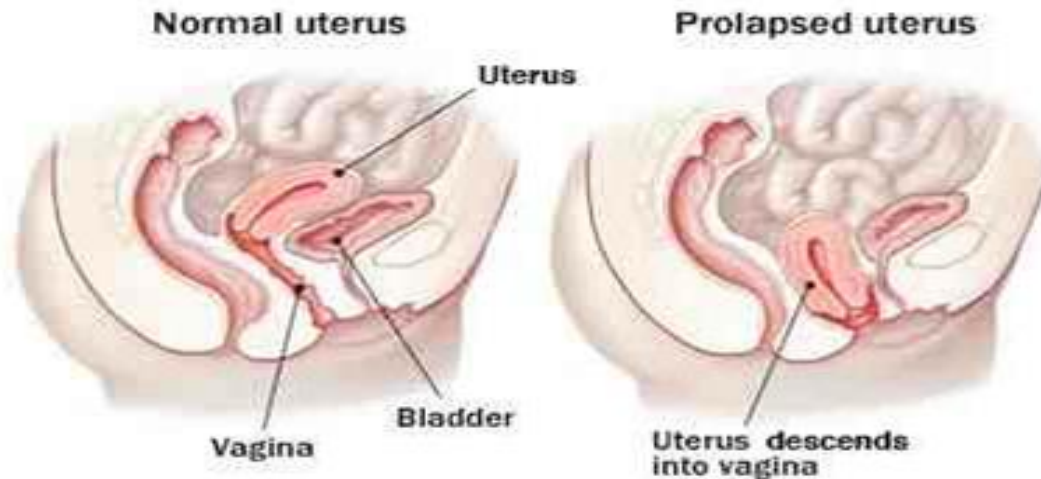
- ❑ FORM THE PELVIC FLOOR: separate pelvis from perineum
- ❑ FORM PELVIC DIAPHRAGM: traversed by urethra, vagina & rectum
- ❑ SUPPORT PELVIC ORGANS



SUPPORT OF UTERUS

- ❑ Ligaments of cervix (especially transverse cervical)
- ❑ Round ligament of uterus (maintains anteverted anteflexed position)
- ❑ Levator ani muscles

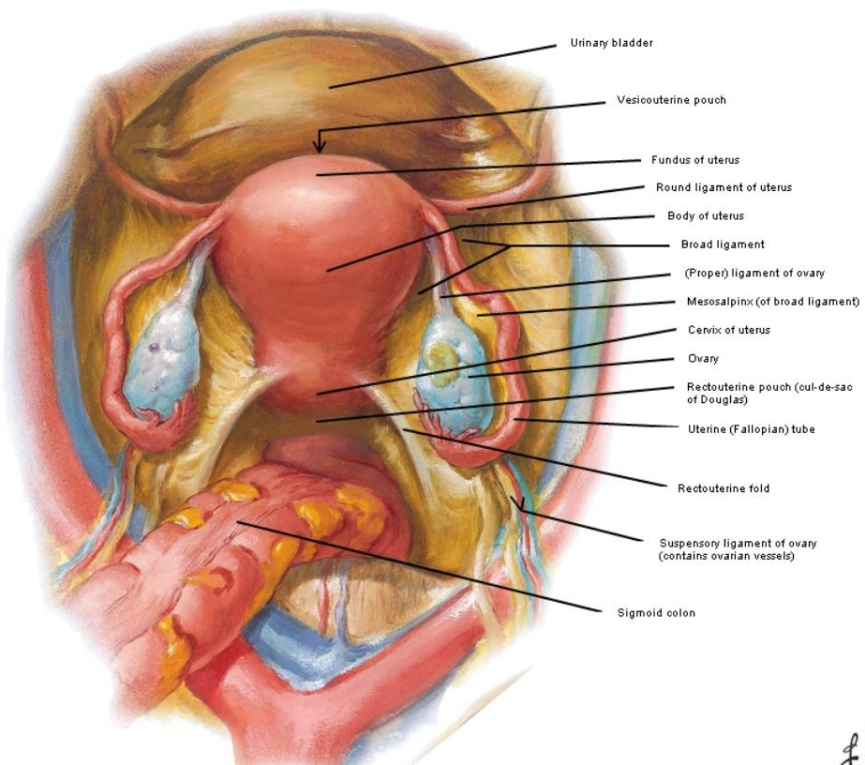
UTERINE PROLAPSE



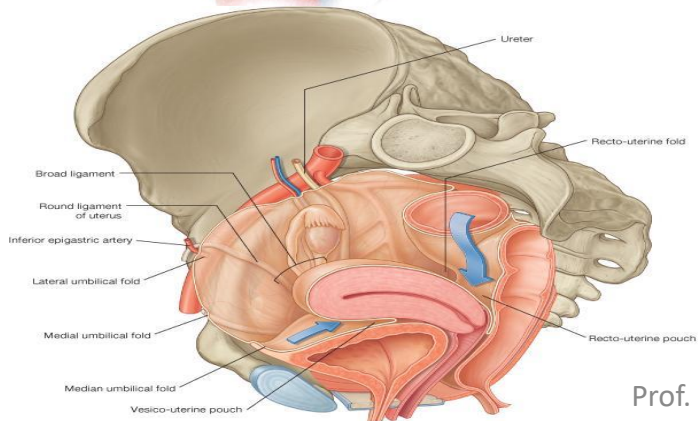
- ❑ Downward displacement of uterus due to damage of:
 1. Ligaments of uterus
 2. Levator ani muscles

FEMALE PELVIC ANATOMY

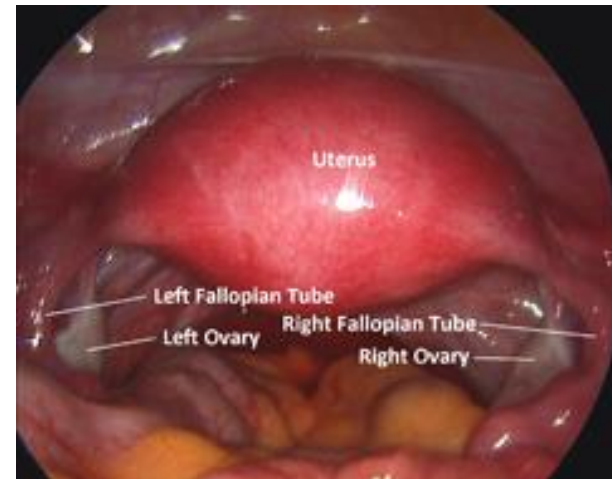
Pelvic Viscera of Female
Superior View - Peritoneum Intact

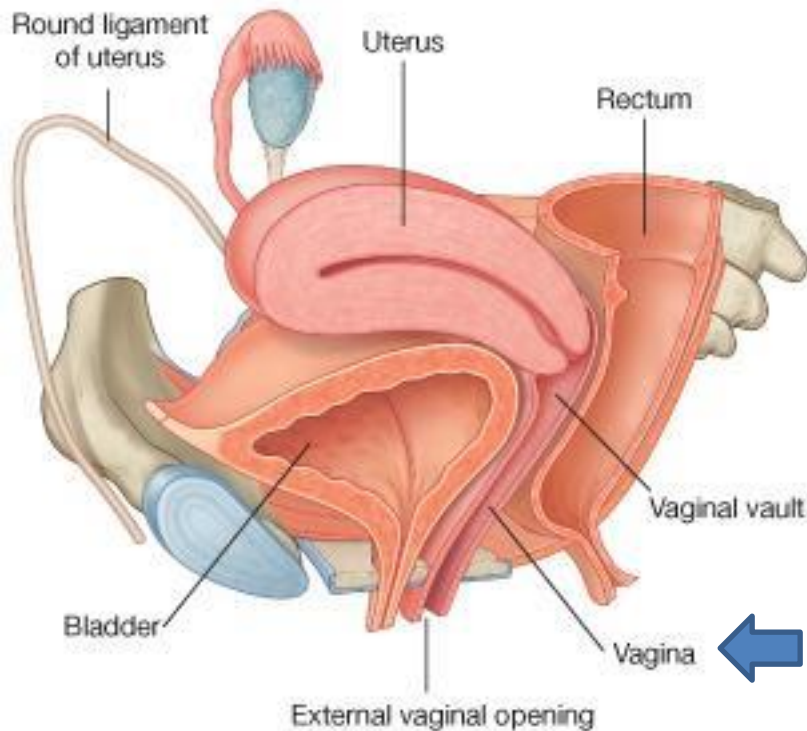


Laparoscopic view

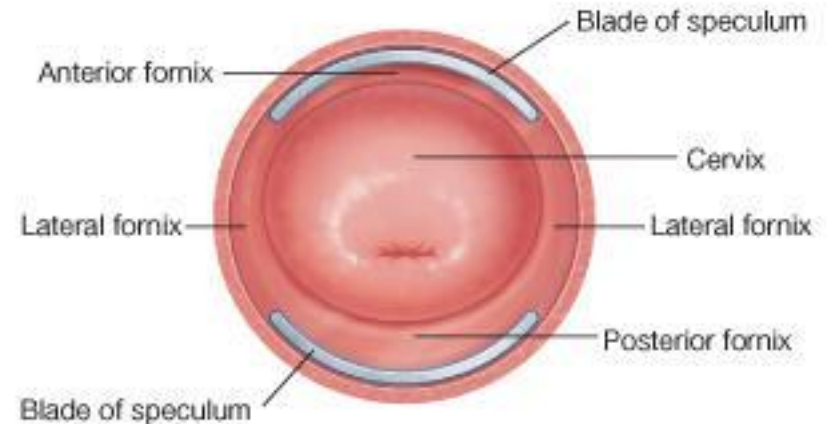


F. Netter M.D.
© 1974





VAGINA



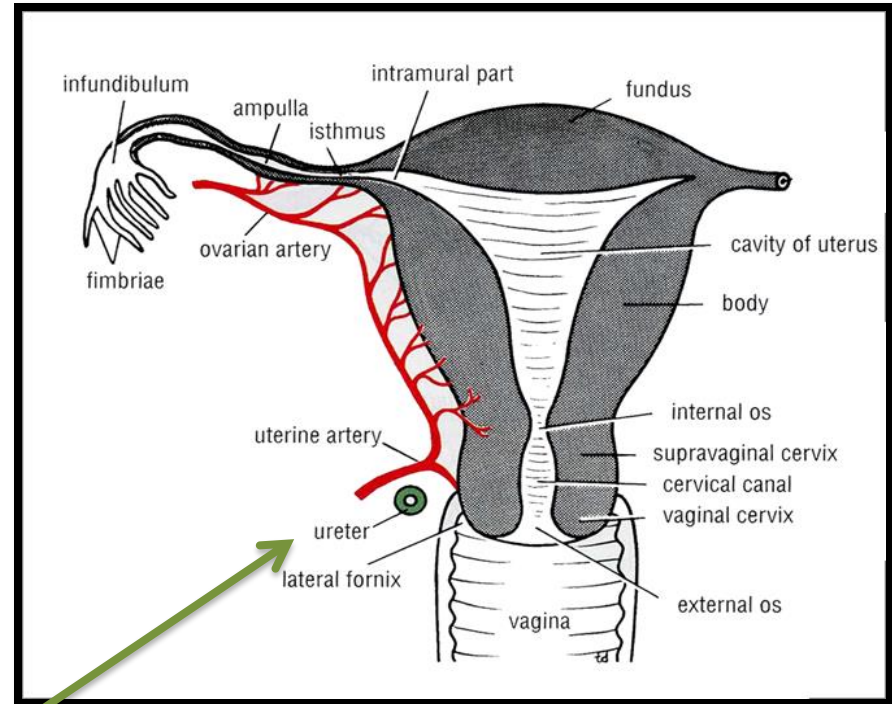
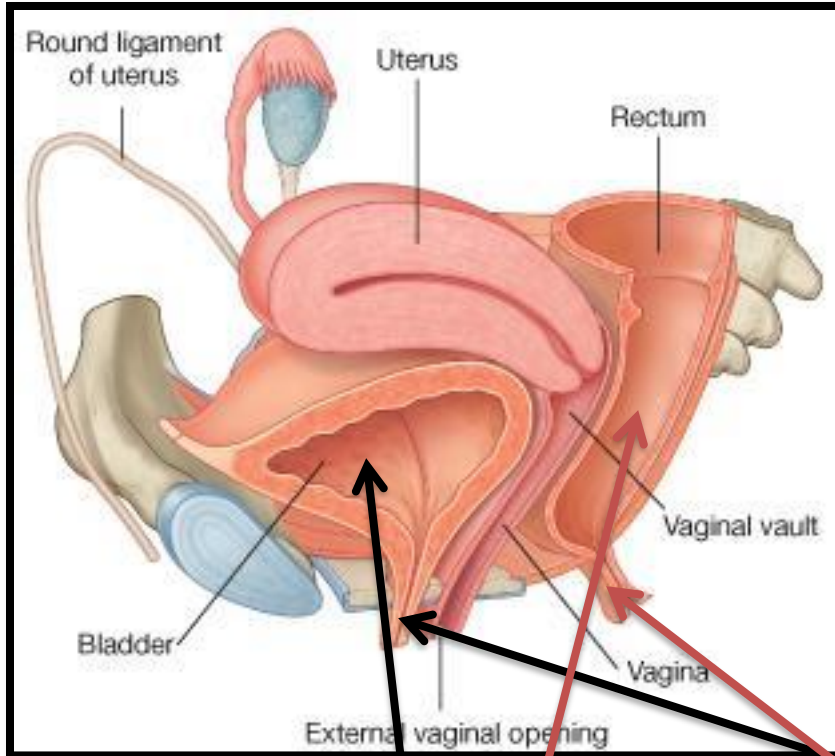
❑ **STRUCTURE:** Fibro-muscular tube

❑ **EXTENT:** From external os, along pelvis & perineum, to open in the vulva (female external genitalia), behind urethral opening

❑ **LENGTH:** Its anterior wall (7.5 cm) is shorter than its posterior wall (9 cm)

❑ **FUNCTION:** 1) Copulatory organ & 2) Birth canal

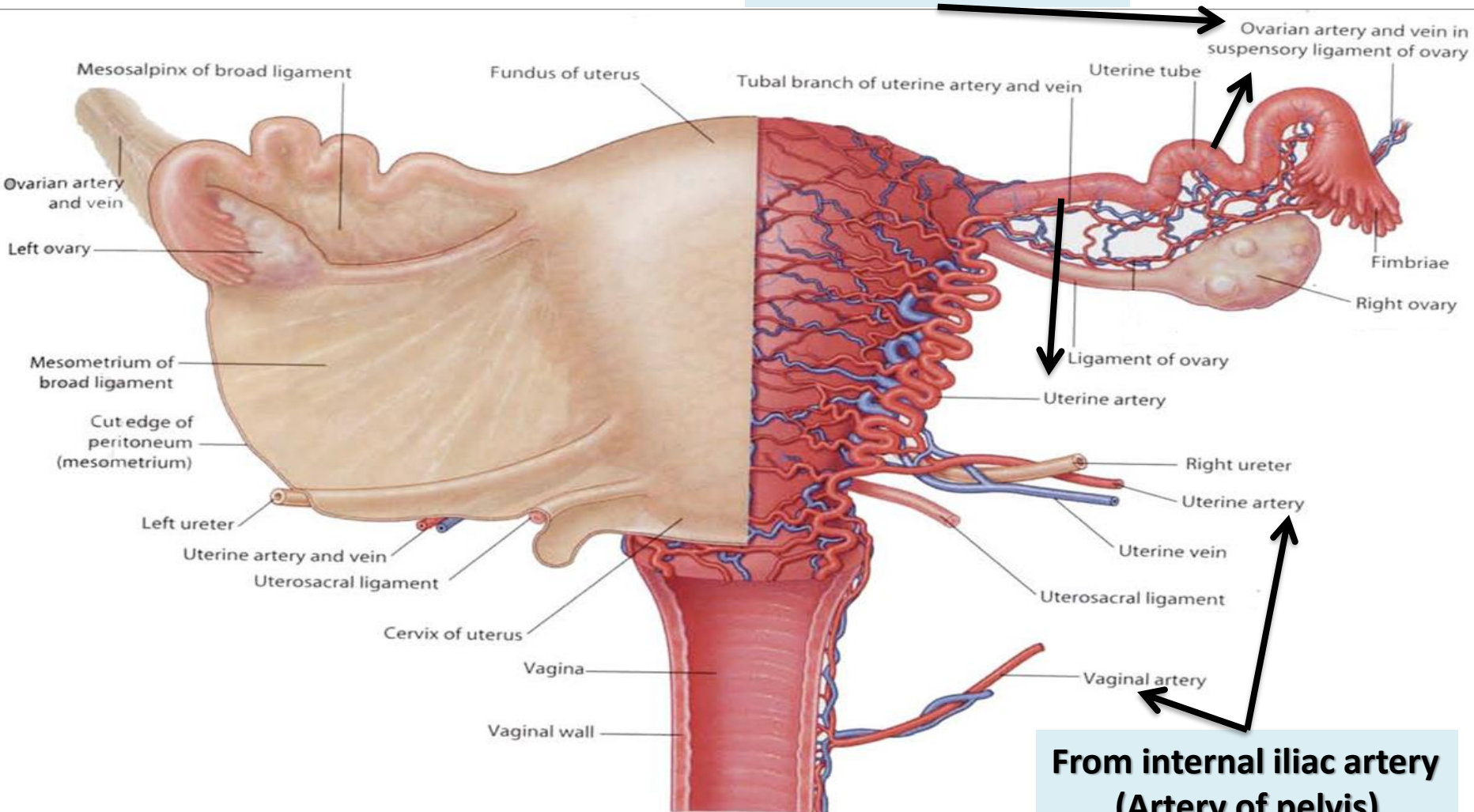
RELATIONS OF VAGINA



- ❑ **ANTERIOR:** Urinary bladder (in pelvis) & urethra (in perineum)
- ❑ **POSTERIOR:** Rectum (in pelvis) & anal canal (in perineum)
- ❑ **LATERAL:** ureters (in pelvis)

ARTERIAL SUPPLY

From abdominal aorta




From internal iliac artery
(Artery of pelvis)

ORGAN	ARTERIES	VEINS	LYMPHATICS	NERVES (AUTONOMIC)
OVARIES	OVARIAN (ABDOMINAL AORTA)	OVARIAN (TO INFERIOR VENA CAVA & LEFT RENAL VEIN)	TO PARAAORTIC LYMPH NODES (IN ABDOMEN)	OVARIAN PLEXUS (IN ABDOMEN)
UTERINE TUBES	<ul style="list-style-type: none"> ▪OVARIAN ▪UTERINE 	<ul style="list-style-type: none"> ▪OVARIAN ▪UTERINE 	<ul style="list-style-type: none"> ▪PARAAORTIC ▪INTERNAL ILIAC 	<ul style="list-style-type: none"> ▪OVARIAN ▪INFERIOR HYPOGASTRIC
UTERUS	UTERINE (INTERNAL ILIAC ARTERY IN PELVIS)	UTERINE PLEXUS (TO INTERNAL ILIAC VEIN)	TO INTERNAL ILIAC LYMPH NODES (IN PELVIS)	INFERIOR HYPOGASTRIC PLEXUS (IN PELVIS)
VAGINA	VAGINAL (INTERNAL ILIAC ARTERY IN PELVIS)	VAGINAL PLEXUS (TO INTERNAL ILIAC VEIN)	TO INTERNAL ILIAC LYMPH NODES (IN PELVIS)	INFERIOR HYPOGASTRIC PLEXUS (IN PELVIS)


QUESTION 1

□ Which one of the following structures is related (or attached) to the lateral end of the ovary?


- 1. Fimbriae of uterine tube** 
- 2. Ampulla of uterine tube**
- 3. Ligament of ovary**
- 4. Round ligament of uterus**

QUESTION 2

□ Which one of the following structures is anterior to the uterus?

- 1. Urinary bladder** 
- 2. Ureter**
- 3. Sigmoid colon**
- 4. Ovary**

QUESTION 3

- Which one of the following groups of lymph nodes are the sentinel nodes (very first nodes affected) in cases of cancer ovary?
 1. Superficial inguinal
 2. Internal iliac
 3. Paraaortic 
 4. External iliac

