



MED437
KING SAUD UNIVERSITY



Anatomy of Female Reproductive System

Lecture (I)

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هذا العمل مبني بشكل أساسي على عمل دفعة 436 مع المراجعة والتدقيق وإضافة الملاحظات ولا يغني عن المصدر الأساسي للمذاكرة

- **Important**
- **Doctors Notes**
- Notes/Extra explanation

{وَمَنْ يَتَوَكَّلْ عَلَى اللَّهِ فَهُوَ حَسْبُهُ}

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.

Introduction

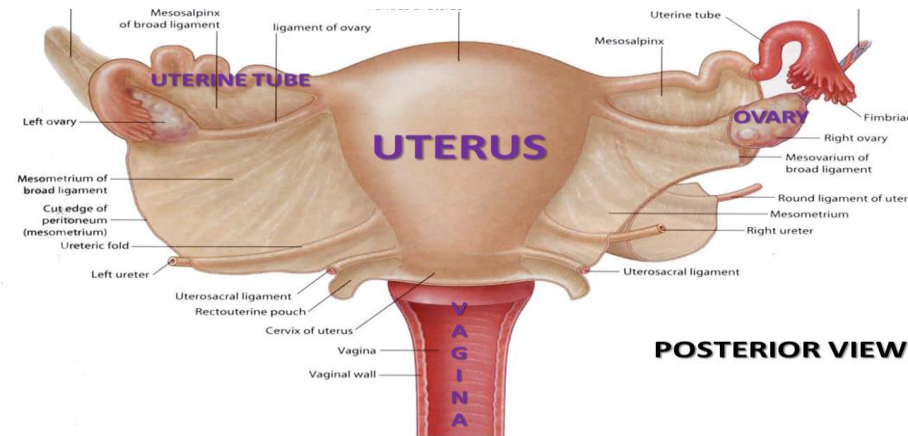


The female reproductive system has 4 main organs:

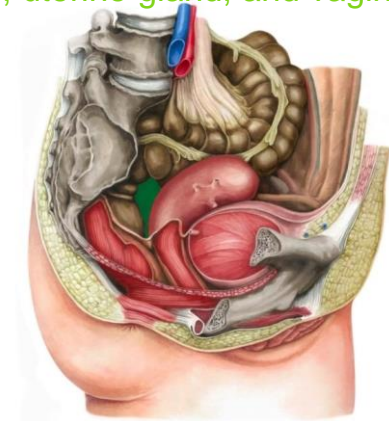
1. Ovaries
2. Fallopian tube
3. Uterus
4. Vagina

What are the primary sex organs?
 - They are the testes and ovaries and their functions are the production of germ cells and secretion of hormones (estrogen, progesterone and testosterone)

Secondary sex organs?
 - uterus, uterine gland, and vagina

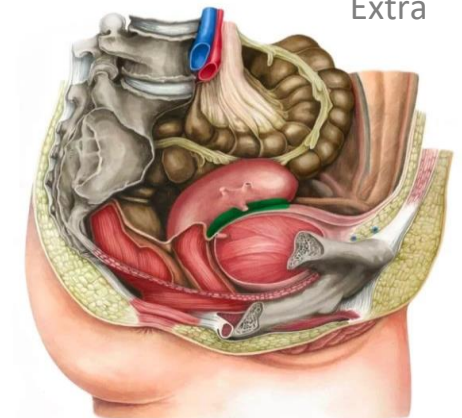


POSTERIOR VIEW

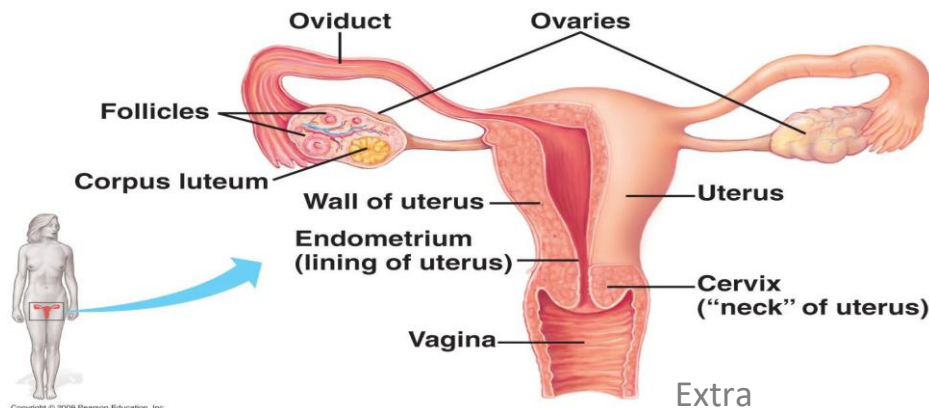


Rectouterine pouch (the green part)

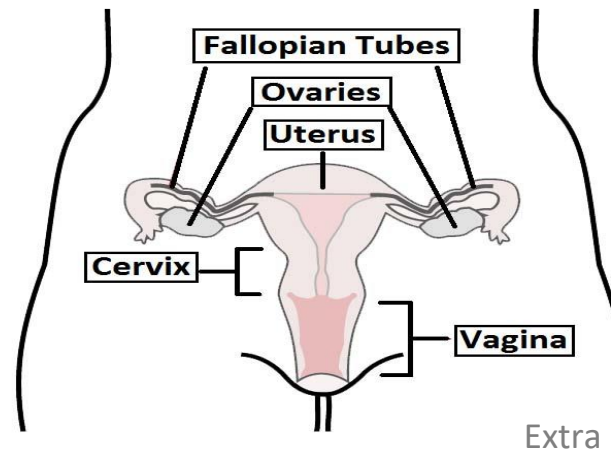
Extra



Uterovesical pouch (the green part)



Extra



Extra

Pelvic Peritoneum in Female

Rectouterine (Douglas) pouch

- Reflection of peritoneum from **rectum** to **upper part of posterior surface of vagina**. (posterior fornix)

Uterovesical (vesicouterine) pouch

- Reflection of peritoneum from **uterus** to **upper surface of urinary bladder**. (at the junction between the body and the cervix of uterus)

Broad ligament of uterus

- Extension of peritoneum from lateral wall of **uterus** to lateral wall of **pelvis**. (double layer)
- **encloses the uterine tubes.**

Extra: pus can accumulate in the rectouterine pouch

Pelvic peritoneum in female:

- Anterior bony boundary is pubis, and posterior is coccyx and sacral contents from anterior to posterior (urinary bladder, uterus, vagina, sigmoid colon. Rectum and anal canal

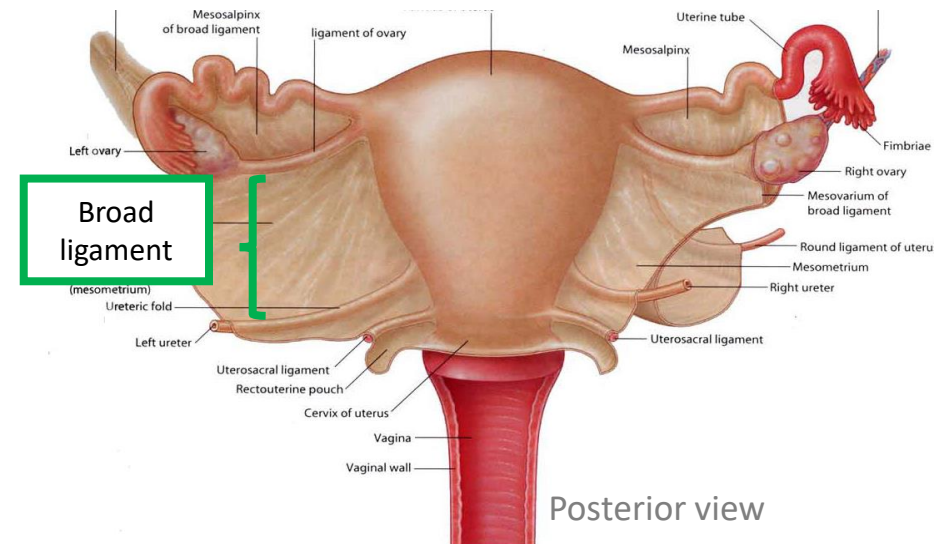
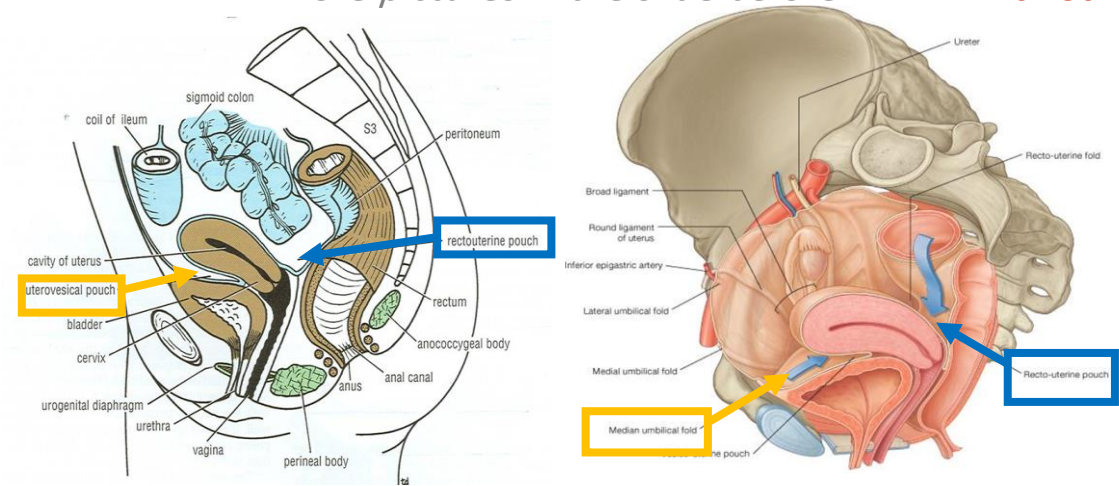


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More pictures in the slide before

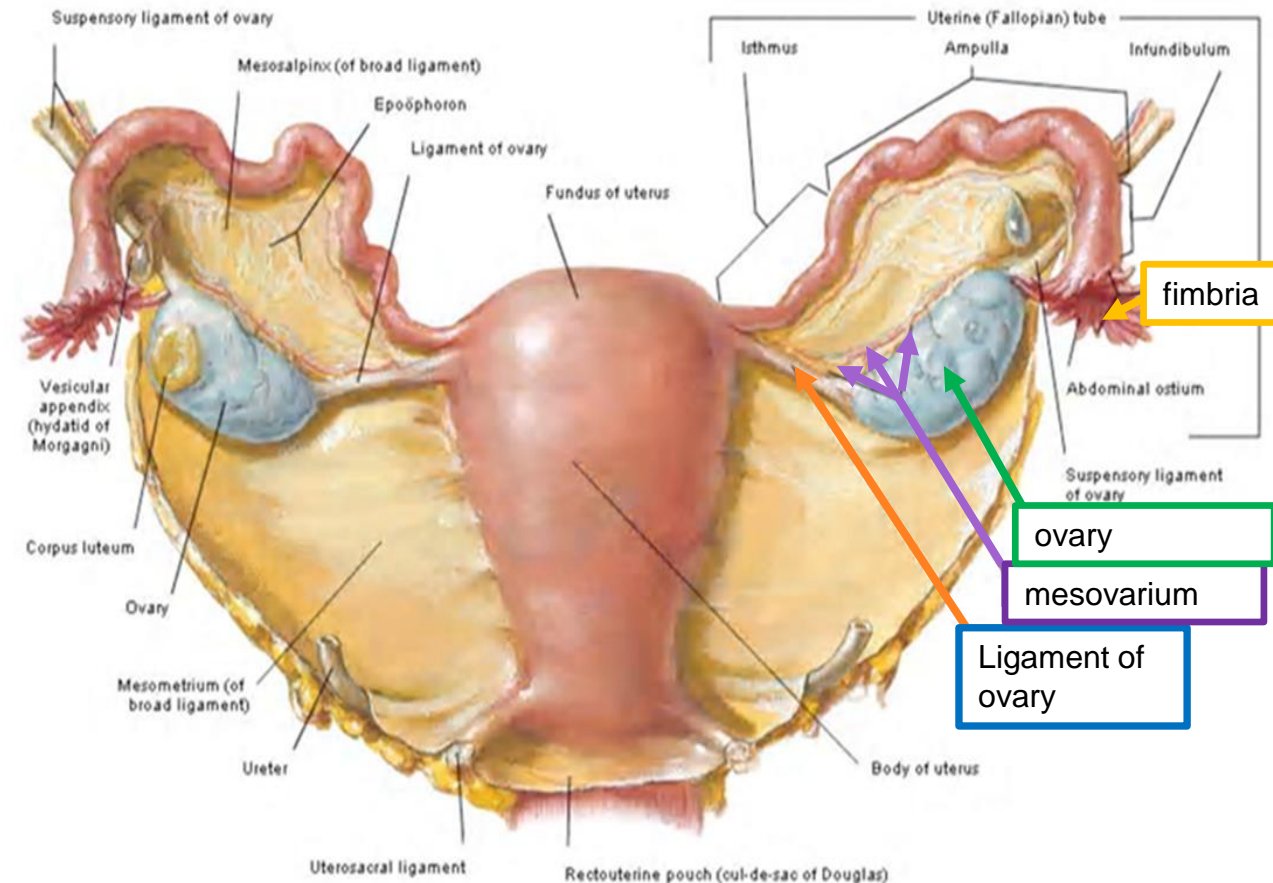


Posterior view

1. Ovaries

lie against the lateral wall of the pelvis in the ovarian fossa

Shape:	almond-shaped organ.
It is attached to the back of the broad ligament by a peritoneal fold (<u>mesovarium</u>). (As an attachment)	
Medial end: (As an attachment)	attached to uterus by <u>ligament of ovary*</u> .
Lateral end: (As a relation)	<u>related</u> to the <u>fimbriae</u> (finger like processes) of the uterine tube.
Function:	Primary sex organs in female. <ul style="list-style-type: none"> • Production of female germ cells • Secretion of female sex hormones



Extra:

- The fimbriae catch the oocyte.

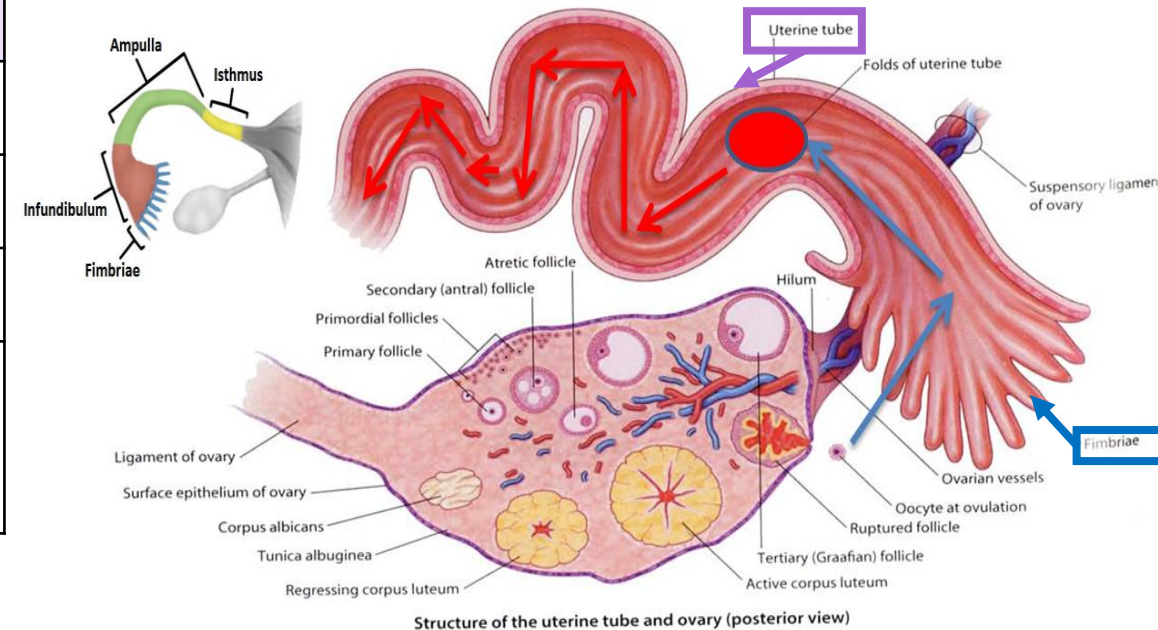
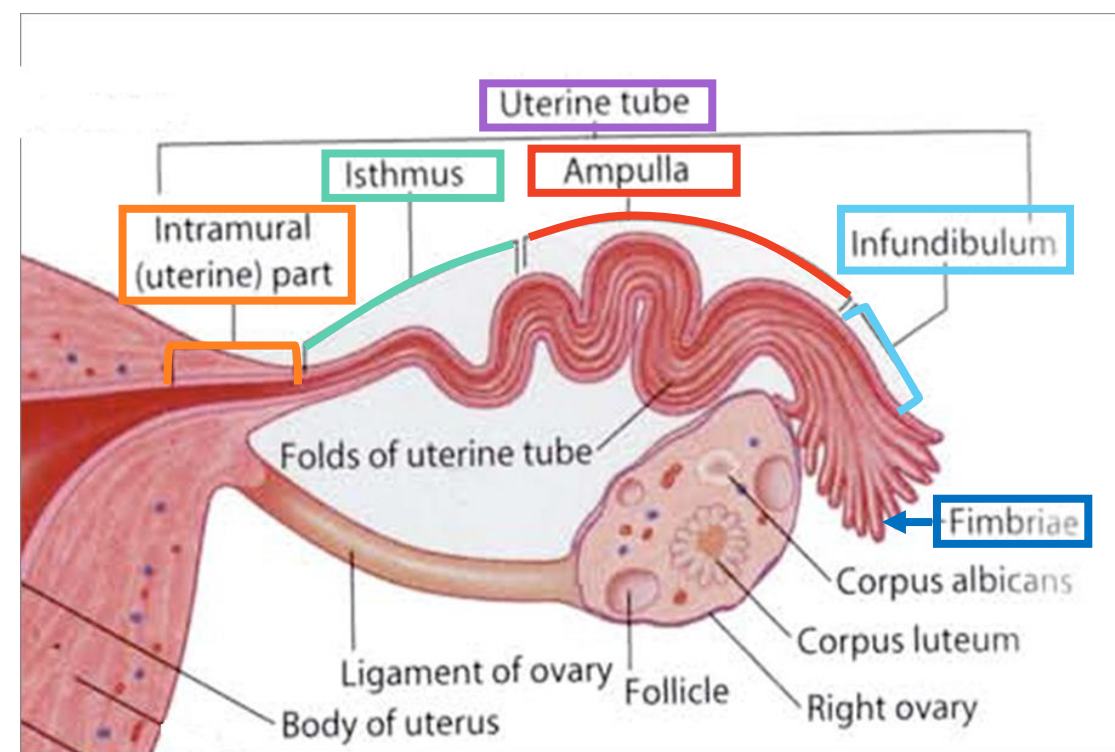
*other names: ovarian ligament, round ligament of the ovary

- Suspensory ligament of the ovary: a fold of peritoneum that contains the ovarian vessels, nerves and lymphatics.

2. Uterine (fallopian) Tube

- It is 10 cm long.
- It is enclosed in the broad ligament of uterus.
- Function:
 - Site of fertilization.
 - Transport of fertilized ovum into the uterus.

Parts	
Intramural part:	opening into the uterine wall.
Isthmus:	narrowest part.
Ampulla:	widest part (it is the site of fertilization)
Infundibulum:	<ul style="list-style-type: none"> • funnel-shaped end. • has finger-like processes (<u>fimbriae</u>) • related to ovary





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3. Uterus

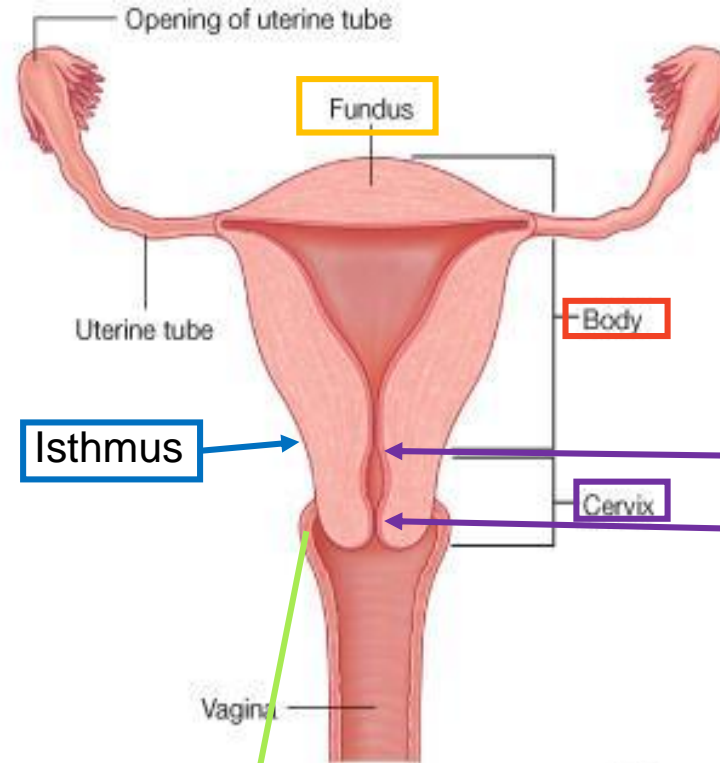
The uterus is a hollow (أجوف), pear shaped muscular organ divided into:

1- Fundus

- no cavity
- The part of uterus above the level of uterine tubes

2- Body

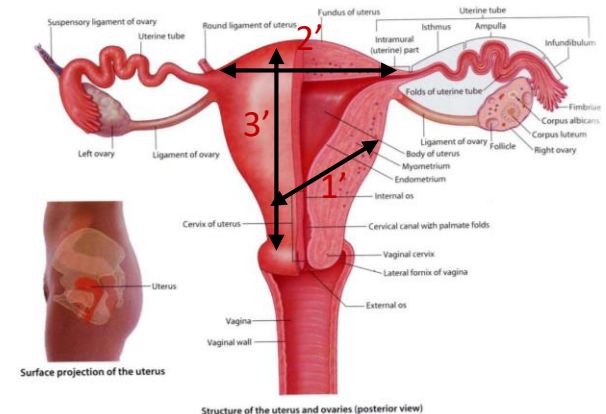
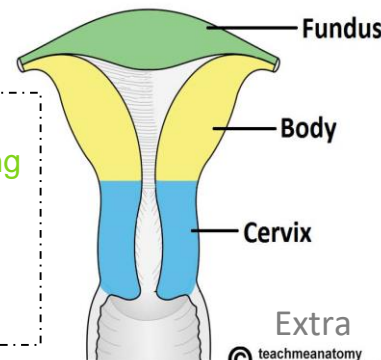
- cavity is triangular
- The part of uterus from the level of uterine tube to the level of the isthmus of uterus



3- Cervix

- cavity is fusiform
- The part of the uterus below the level of the isthmus of the uterus
- divided into:
 1. Supravaginal part
 2. Vaginal part

Lateral fornix:
 - It is a part of the vagina surrounding the vaginal part of the cervix of the uterus. (there's also posterior and anterior fornices -plural noun of fornix-)



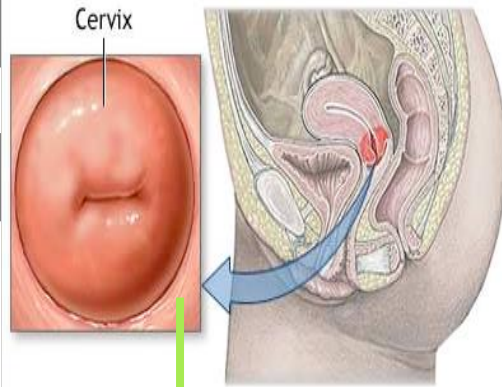
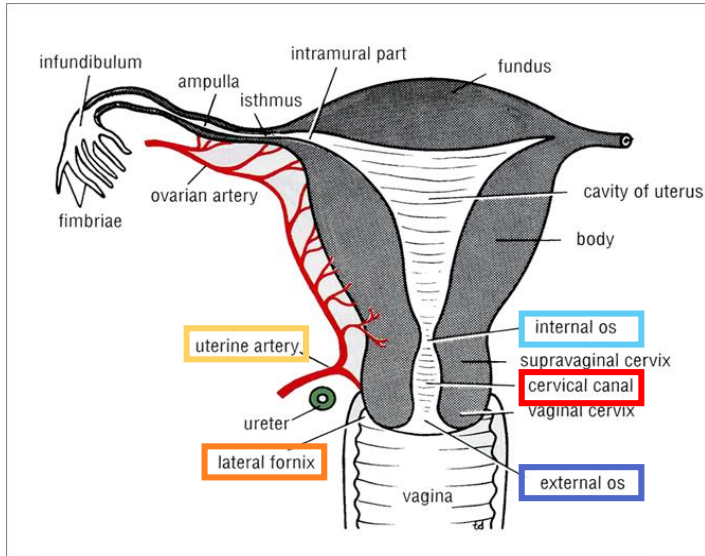
These measurements are in a women who never got pregnant "nulligravida"

3. Uterus

Cervical Canal



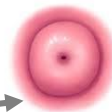
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Fornix

From inside to outside:

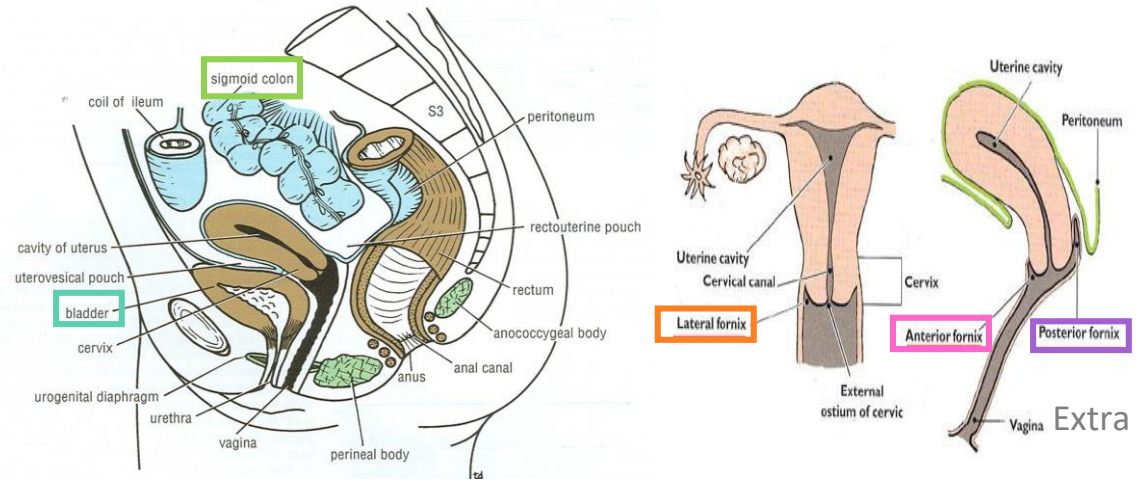
Uterus (body)
Internal os
Cervical canal
External os
Vagina



Nulliparous:
never gave birth



Multiparous:
gave birth



Relations of Uterus: Important!

Fundus + Body + Supravaginal Part of Cervix:

Anterior	Superior surface of urinary bladder
Posterior	Sigmoid colon
Lateral	Uterine artery

Vaginal part of Cervix
(surrounded by vaginal fornices)

Anterior	Anterior fornix of vagina
Posterior	Posterior fornix of vagina
Lateral	Lateral fornices of vagina

INTERNAL OS: opening between cavity of body of uterus & cavity of cervix (cervical canal)

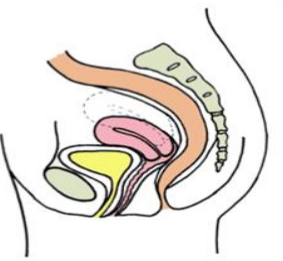
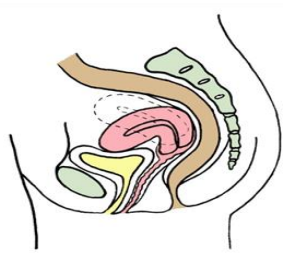
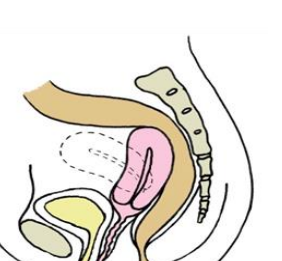
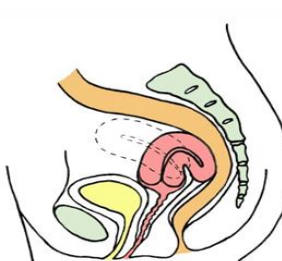


EXTERNAL OS: opening between cervical canal & cavity of vagina

- 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.**

3. Uterus

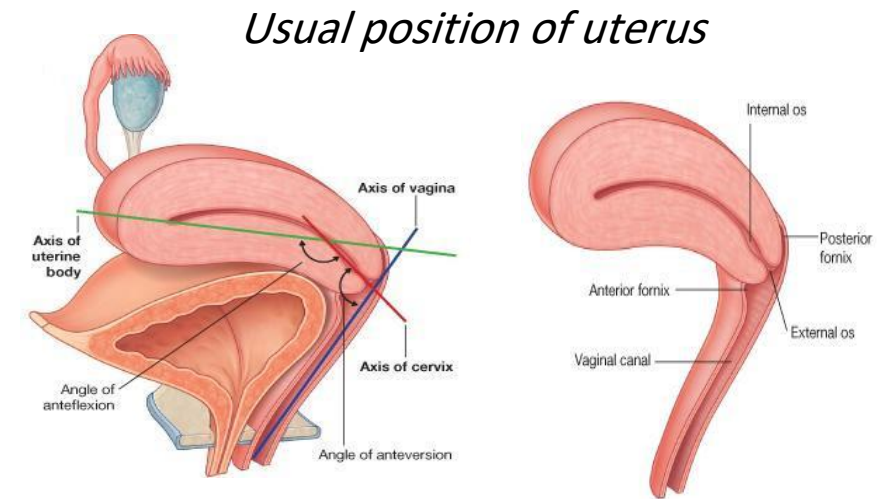
Positions of the Uterus

We have 2 normal positions for the uterus. The more common one is anteverted-anteflexed.

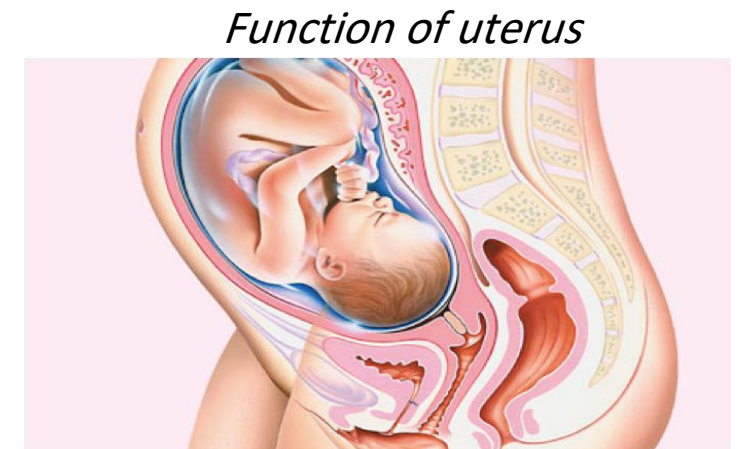
1. Anteverted-anteflexed		2. Retroverted-retroflexed	
			
			
ANTEVERTED UTERUS يعني عضو مقلوب على عضو	ANTEFLEXED UTERUS يعني عضو مقلوب على نفسه	RETROVERTED UTERUS	RETROFLEXED UTERUS
Long axis of <i>whole</i> uterus is bent forward on long axis of <u>vagina</u>	Long axis of <i>body</i> of uterus is bent forward on long axis of <u>cervix</u>	<i>Fundus & body</i> of uterus are bent backward on the <u>vagina</u> and lie in rectouterine pouch	Long axis of <i>body</i> of uterus is bent backward on long axis of <u>cervix</u>

Verted ---> Vagina

Flexed ---> Cervix



Usual position of uterus



Function of uterus

3. Uterus

Ligaments of the Uterus (keep the uterus in its correct position)



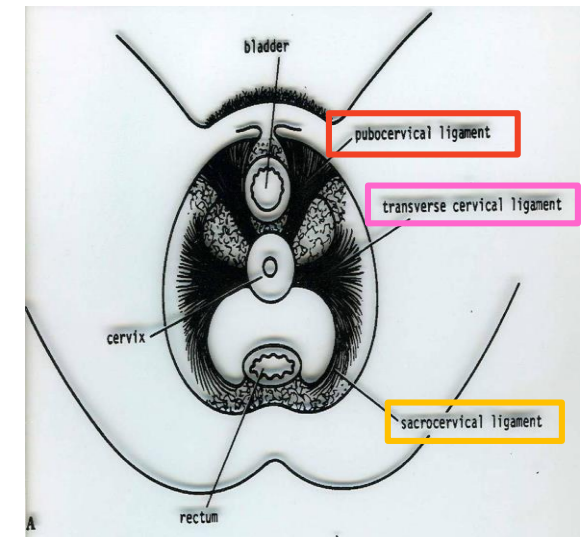
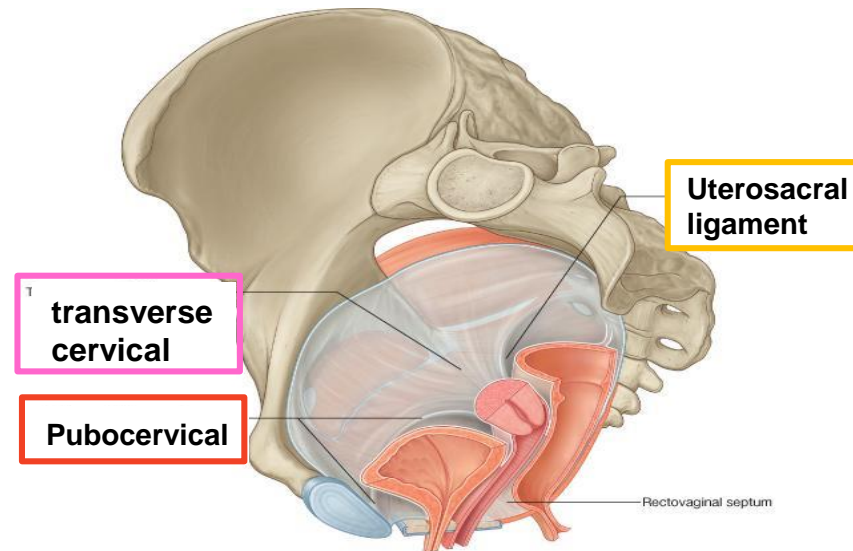
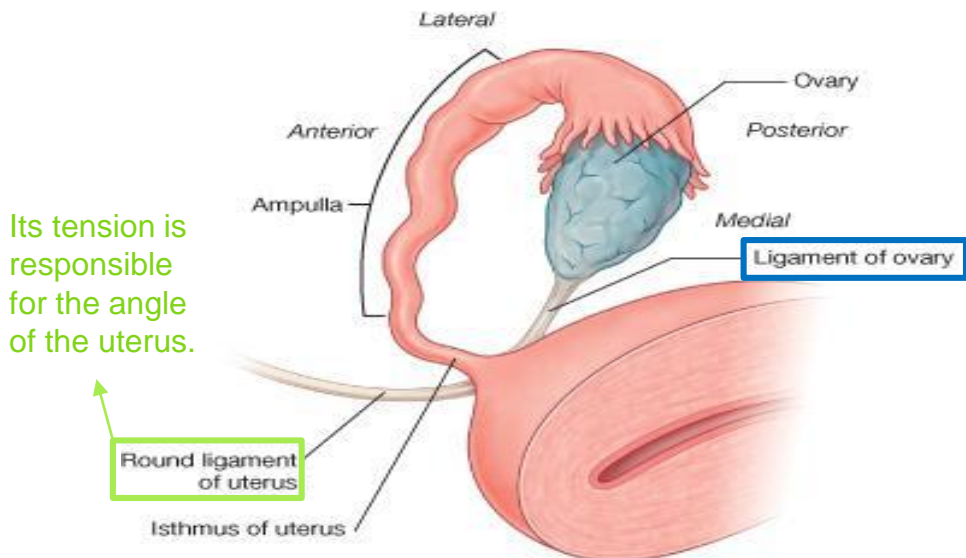
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I. Ligaments at junction between fundus & body of uterus (At the level of uterine tube) :

1. Round ligament of uterus (Extends through inguinal canal to labium majus)
2. Ligament of ovary

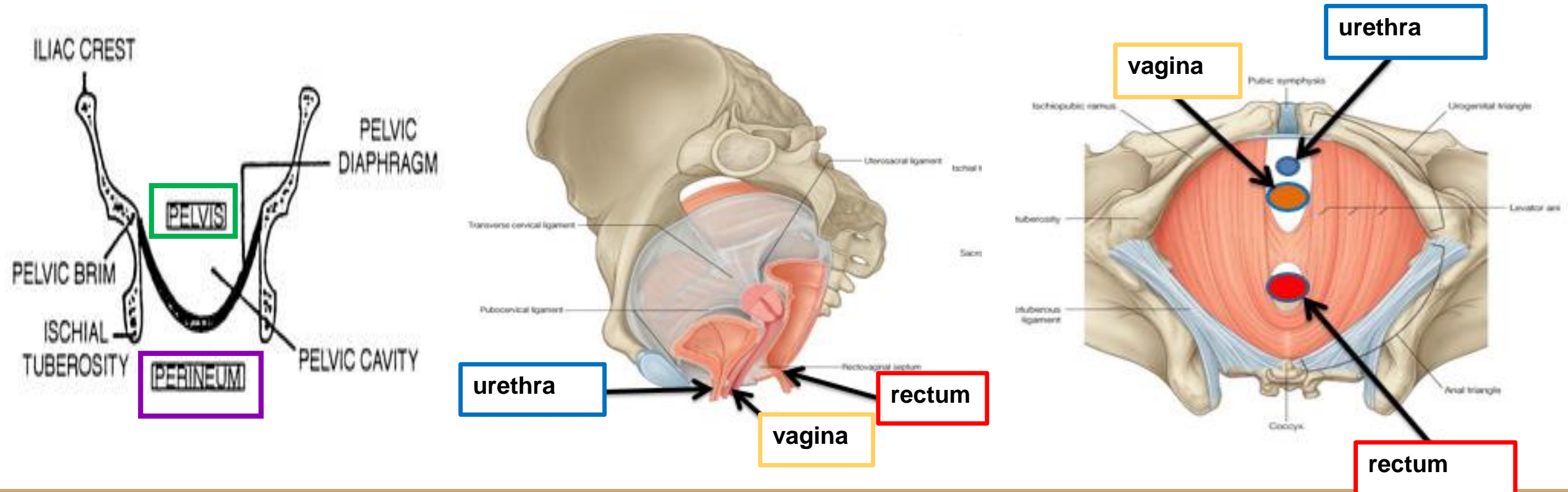
II. Ligaments of cervix: Extend from cervix to :

1. Anterior pelvic wall (pubocervical)
2. Lateral pelvic wall (transverse cervical or cardinal) **this is the main support**
3. Posterior pelvic wall (uterosacral or sacrocardinal).



Levator Ani Muscles

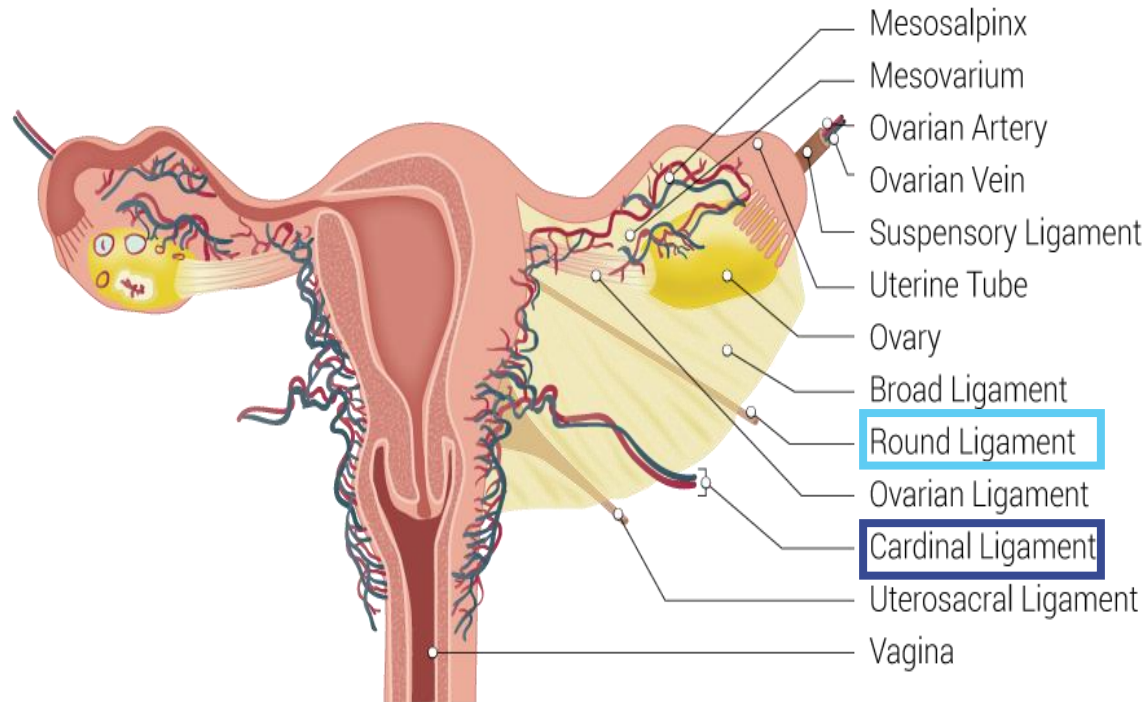
- Form the pelvic floor: separate pelvis from perineum
- Form pelvic diaphragm: traversed by urethra, vagina & rectum (they pass through it)
- Support pelvic organs



3. Uterus

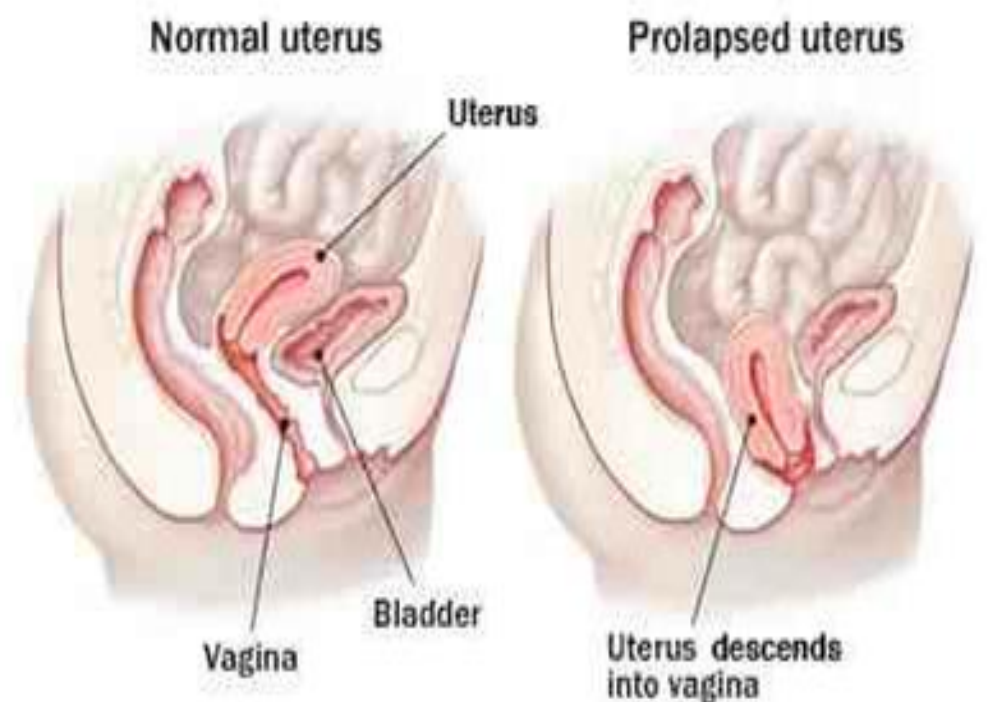
Support of Uterus:

1. Round ligament of uterus (maintains anteverted anteflexed position)
2. Ligaments of cervix (especially transverse cervical)
3. Levator ani muscles

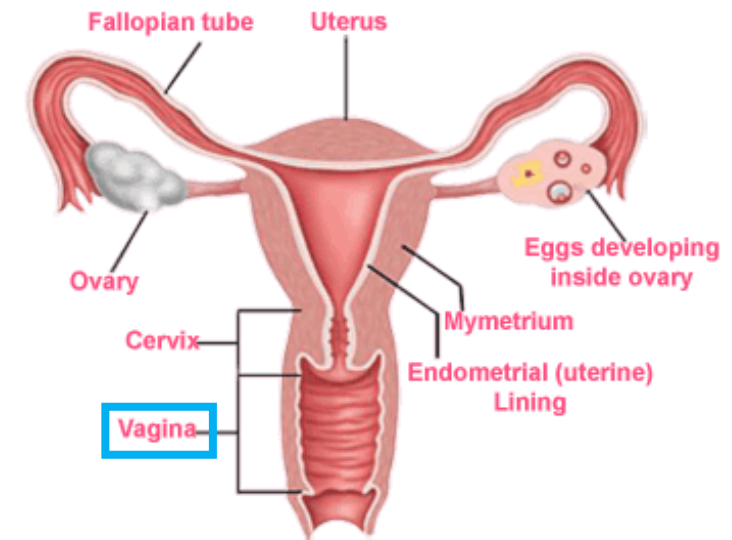
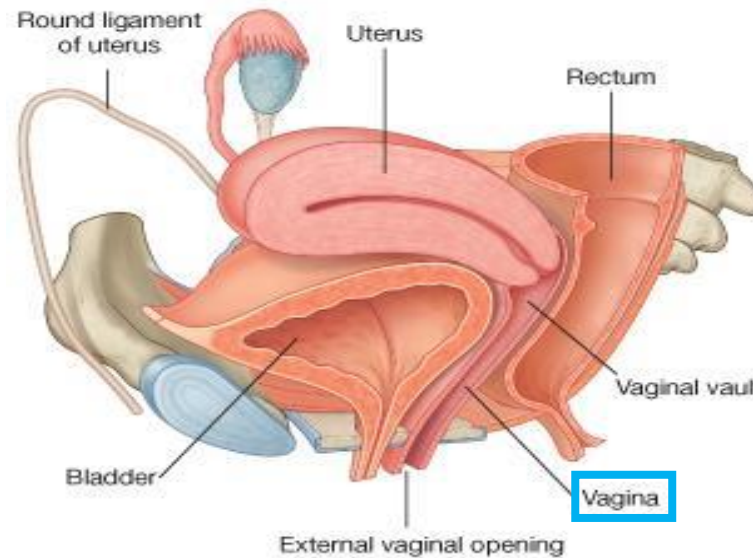
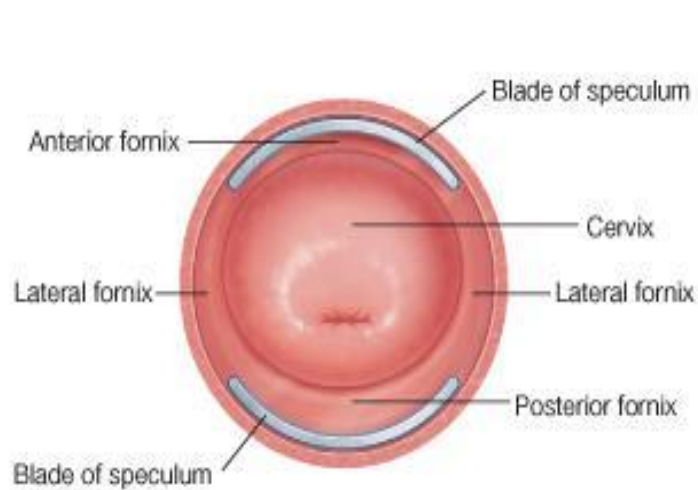


Uterine prolapse

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



4. Vagina

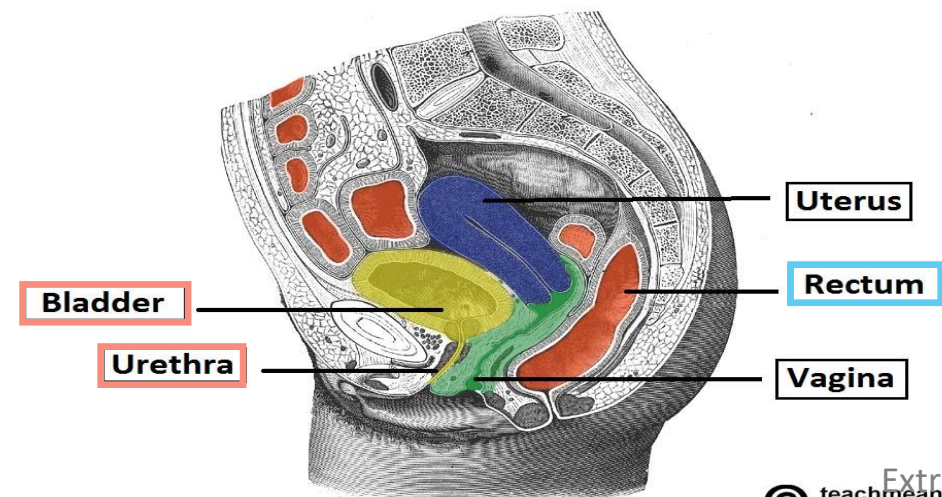
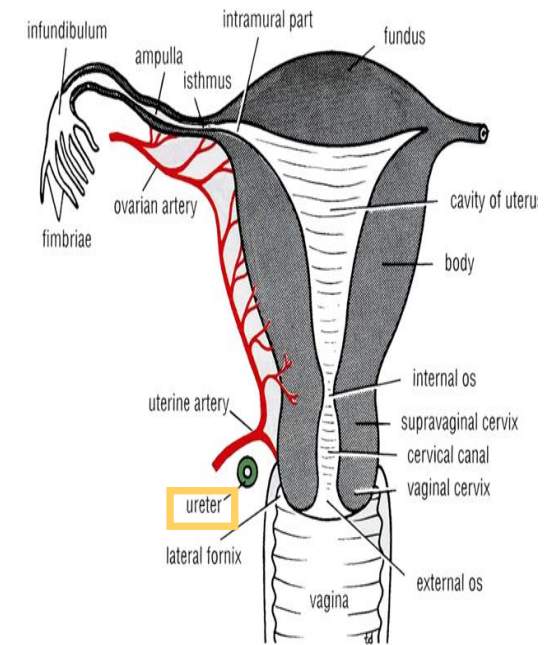
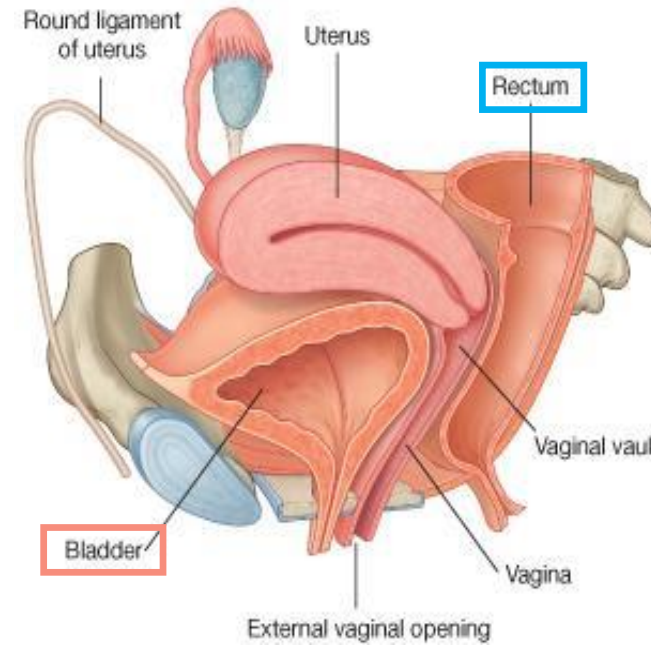


<i>Structure</i>	fibro-muscular tube
<i>Extent</i>	from external os, along pelvis & perineum, to open in the vulva (female external genitalia), behind urethral opening
<i>Length</i>	its anterior wall (7.5 cm) is shorter than its posterior wall (9 cm)
<i>Function</i>	1. copulatory organ (organ involved in sexual reproduction) 2. birth canal

4. Vagina

Relations of Vagina

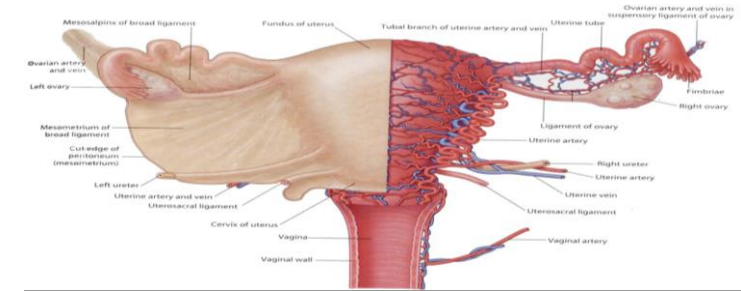
<i>Relations of Vagina:</i>		
<i>Important</i>		
	In Pelvis	In Perineum
Anterior	urinary bladder	urethra
Posterior	rectum	anal canal
Lateral	Ureters (to be more specific, it is related to the lateral fornix)	-



Supply

The arterial supply of the female reproductive system is from:

1. Abdominal aorta → ovarian artery
2. Internal iliac artery (artery of pelvis) → vaginal & uterine artery



	Organ	Arteries	Veins	Lymphatics	Nerves (autonomic)
<i>abdomen</i>	1. Ovaries	Ovarian (from the abdominal aorta)	Ovarian (drain in the inferior vena cava (for right ovary) and left renal vein (for left ovary))	To paraaortic lymph nodes (in abdomen)	Ovarian plexus (in abdomen)
<i>both</i>	2. Uterine tubes	-Ovarian -Uterine	-Ovarian -Uterine	-Paraaortic -internal iliac	-Ovarian -Inferior hypogastric
<i>pelvis</i>	3. Uterus	Uterine (from internal iliac artery in pelvis)	Uterine plexus (to internal iliac vein)	To internal iliac lymph nodes (in pelvis)	Inferior hypogastric plexus (in pelvis)
	4. Vagina	Vaginal (from internal iliac artery in pelvis)	Vaginal plexus (to internal iliac vein)	To internal iliac lymph nodes (in pelvis)	Inferior hypogastric plexus (in pelvis)

Summary

Organ	Function	Parts	Relations		
			Anterior	Posterior	Lateral
1. Ovaries	Primary sex organs in female.	Medial end → uterus by ligament of ovary. Lateral → fimbriae of the uterine tube.	-	-	-
2. Uterine tubes	Site of fertilization (ampulla)	1. Intramural 2. Isthmus 3. Ampulla 4. Infundibulum	-	-	-
3. Uterus	Pregnancy (maintenance of fetus)	1. Fundus 2. Body 3. Cervix (between internal and external os)	Superior surface of urinary bladder	Sigmoid colon	Uterine artery
			Anterior fornix of vagina	Posterior fornix of vagina	Lateral fornices of vagina
4. Vagina	copulatory organ and birth canal	-	Urinary bladder (in <u>pelvis</u>) & urethra (in <u>perineum</u>)	Rectum (in <u>pelvis</u>) & anal canal (in <u>perineum</u>)	ureters (in <u>pelvis</u>)

Fundus + Body + Supravaginal Part of Cervix

Vaginal Part of Cervix

MCQs

Q1) A reflection of the peritoneum from the uterus to upper part of urinary bladder:

- a) Broad ligament of the uterus
- b) Rectouterine pouch
- c) Douglas pouch
- d) Uterovesical pouch

Q2) In which part of the uterine tube does fertilization take place?

- a) Isthmus
- b) Ampulla
- c) Intramural
- d) Infundibulum

Q3) Which one of the following consider as posterior relation of vagina in perineum ?

- a) ureter
- b) rectum
- c) uterus
- d) anal canal

Q4) Which one of the following is the origin of uterine artery ?

- a) aorta
- b) abdominal aorta
- c) internal iliac
- d) external iliac

Q5) What muscle that separate pelvis from perineum?

- a) Levator ani
- b) Obturator internus
- c) Psoas major
- d) Piriformes

Q6) Which of the following ligaments support the uterus and prevent prolapse?

- a) Round ligament
- b) Ovarian ligament
- c) Cardinal ligament
- d) Broad ligament



Good luck
Special thank for team436 ❤️

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- References:
 1. Girls' & Boys' Slides
 2. Greys Anatomy for Students
 3. TeachMeAnatomy.com

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