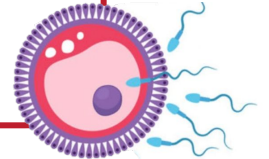


Female Reproductive System

Reproductive block-Anatomy-Lecture

Editing file



Objectives

Color guide :
Only in boys slides in **Green**
Only in girls slides in **Purple**
important in **Red**
Notes in **Grey**

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

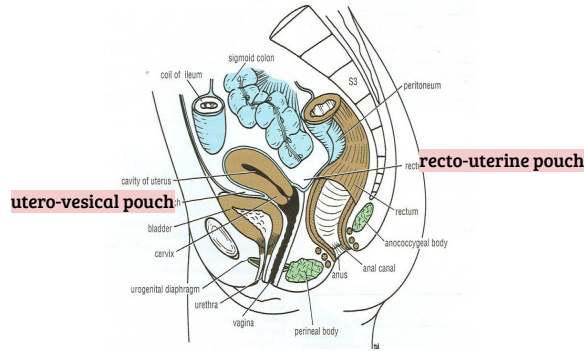
- List the organs of female reproductive system.
- Describe the pelvic peritoneum in female.
- Describe the position and relations of the ovaries.
- List the parts of the uterine tube.
- Describe the anatomy of uterus regarding: subdivisions, cavity, relations, ligaments & main support.
- Describe the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



Pelvic peritoneum in female

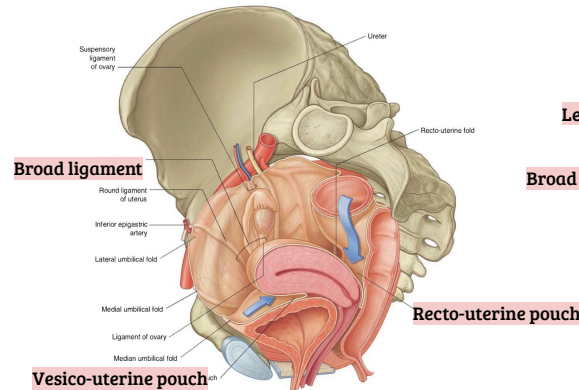
1

Rectouterine (Douglas) pouch: Reflection of peritoneum from rectum to upper part of posterior surface of vagina. Used in the treatment of end stage renal failure in patients who are treated with peritoneal dialysis in which the tip of dialysis catheter is placed into the deepest point of the pouch. (this is where pus collects in a pelvic infection)



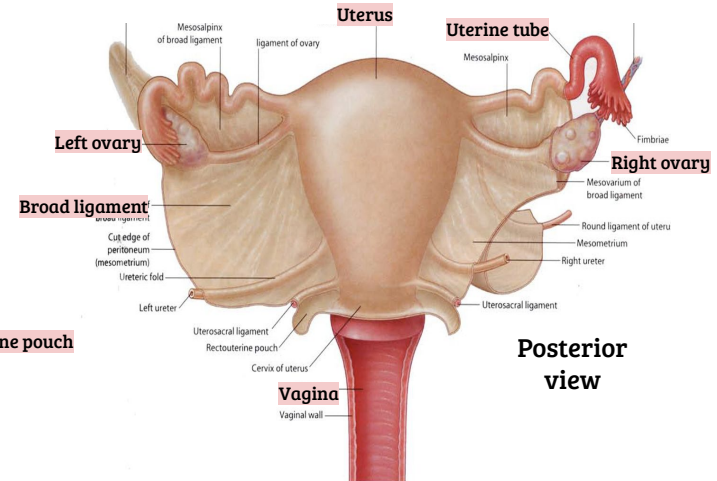
2

Uterovesical (vesicouterine) pouch: Reflection of peritoneum from uterus to upper surface of urinary bladder.



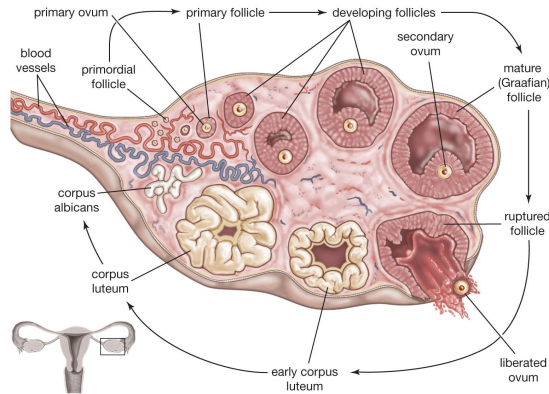
3

Broad ligament of uterus: Extension of peritoneum from lateral wall of uterus to lateral wall of pelvis, encloses the uterine tubes. has 3 parts: Mesosalpinx, Mesovarium and Mesometrium

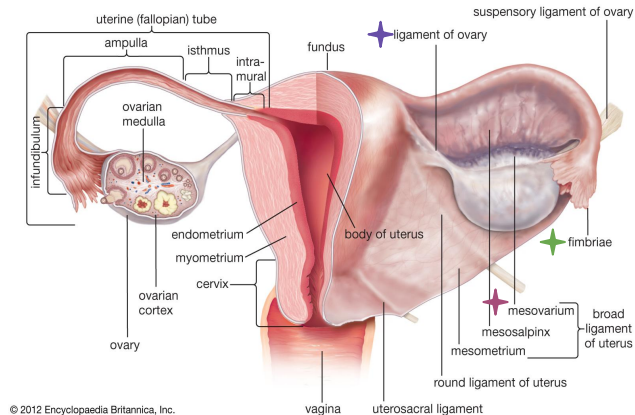


The Ovaries:

- Primary sex organs in female
- It is an almond-shaped organ
- It is attached to the back of the broad ligament by a peritoneal fold (**mesovarium** & the other parts of the broad ligament are important in keeping the ovaries in its place and position. The position of the ovaries are variable but usually are found hanging down in rectouterine pouch while during pregnancy the enlarging uterus will pull up the ovaries in the abdominal cavity)
- Its **medial** end is attached to the uterus by the **ligament of the ovary**
- Its **lateral** end is related to the **fimbriae of the uterine tube**
- **Function:** Production of female germ cells (Oocyte/egg) , Secretion of female sex hormones (estrogen & progesterone)



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The uterine (fallopian) tubes

- 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
- Divided into:

01

Intramural part
opening into the
uterine wall

02

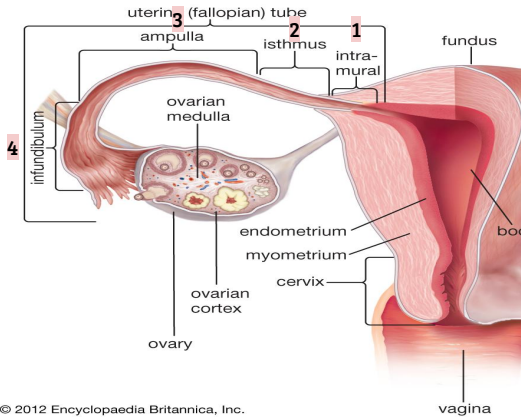
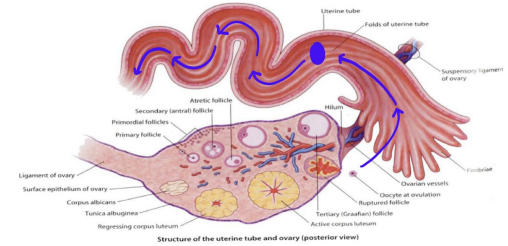
Isthmus
narrowest part

03

Ampulla
widest part (**site of fertilization**)
Equipped everything for the
fertilization (the tissue lining of this
area and the micro-environment
signals all help the fertilization
happens)

04

Infundibulum
funnel- shaped end, has finger- like
processes (**fimbriae**), related to ovary
fimbriae have a special movement that helps
to grab the oocyte



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Usually women are born with approximately 2 millions eggs in their ovaries. Before puberty about 11 thousands of these eggs die in every month. At puberty a woman has only about 400 thousands eggs remaining in her ovaries and after puberty a women will lose one thousand eggs every month instead of 11 thousands and only one of the one thousand follicles will mature and reach to the fallopian tubes. this phenomenon of the degeneration/dying of this huge number of eggs is independent of any hormonal production, pregnancy, nutritional supplements, lifestyle, birth controlling pills. Basically independent of any process or anything that could be done even ovulation inhibition or stimulation and nothing will stop the death of one thousands eggs every month. This means out of the 2 millions follicles only about 400 follicles will be matured during the whole life of the woman. After menopause (age 50-55) only very little or no follicles remain in her ovaries.



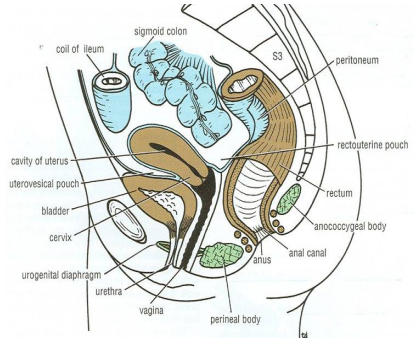
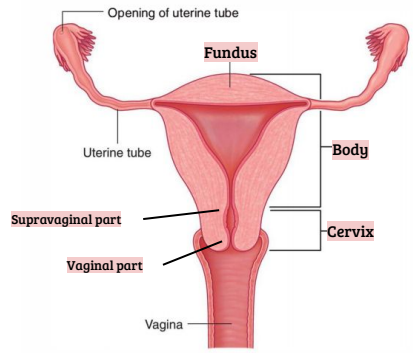
The Uterus

- A hollow, pear-shaped muscular organ
- Function: pregnancy

Divided into:

- Fundus**
- Body**
- Cervix:**

- no cavity
- implantation site
- **above the level of uterine tubes**
- cavity is triangular
- from the level of uterine tube to the level of the isthmus of uterus
- cavity is fusiform
- below the level of the isthmus of the uterus
- divided into: Supravaginal part, Vaginal part



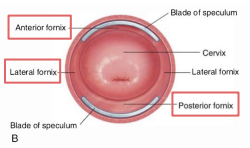
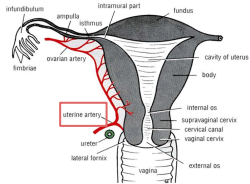
Relations of uterus

Fundus + body + supravaginal part of cervix

Anterior
superior surface of urinary bladder

Posterior
sigmoid colon

Lateral
uterine artery



Vaginal part of cervix

Anterior
anterior fornix of vagina

Posterior
posterior fornix of vagina

Lateral
lateral fornices of vagina

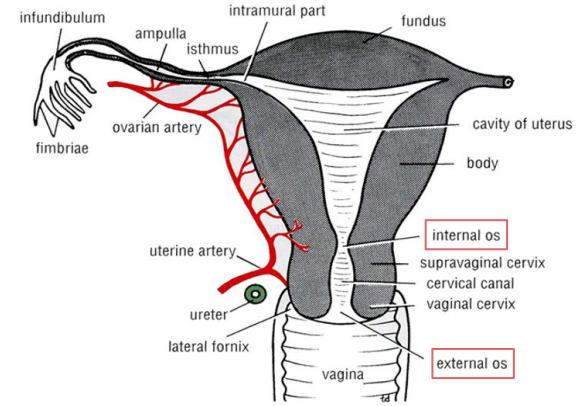
The Uterus: cervical canal

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

Internal OS

External OS

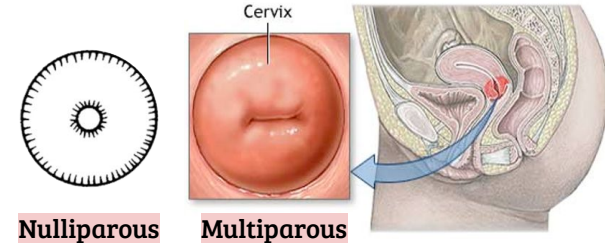
opening between
cervical canal &
cavity of vagina



In a **nulliparous** woman: external os appears circular
(Woman who Didn't give birth, external os appears intact)



In a **multiparous** woman: external os appears as a transverse slit with an anterior & a posterior lip
(B/c during birth there will be expansion of the muscles and this will form these lips)



Nulliparous

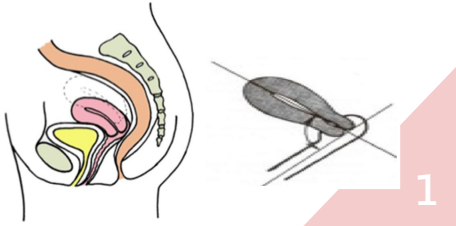
Multiparous



Positions of uterus

Anteverted uterus

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

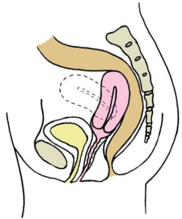


Anteflexed uterus

long axis of **whole body** is bent forward on long axis of **cervix**



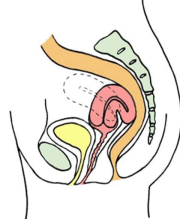
3



Retroverted uterus

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

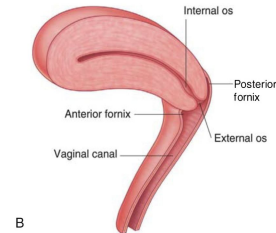
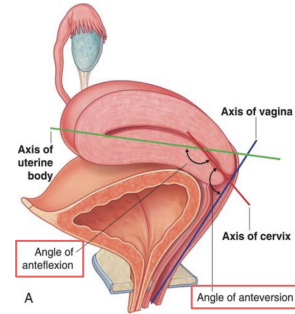
4



Retroflexed Uterus

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

Usual position of uterus



Anteverted Anteflexed Uterus



Support of uterus

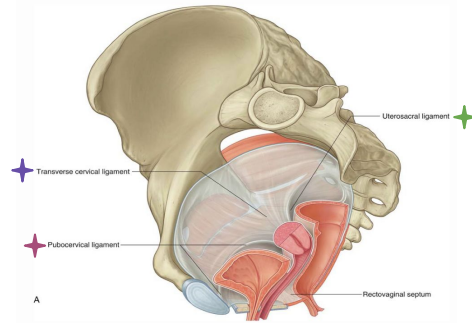
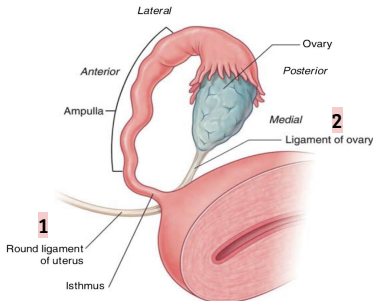
Ligaments of uterus

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

- ▶ Extends through inguinal canal to labium majus
- ▶ They are Round ligament (anterior to the uterine tube) and ovarian ligament (posterior to the uterine tube)
- ▶ Round ligament will maintains anteverted anteflexed position)

2 Ligaments of cervix.

- ▶ Extend from cervix to:
 - anterior portion as a pubocervical ligament
 - lateral portion as a transverse cervical or cardinal ligament
 - posterior portion as an uterosacral or sacrocervical ligament



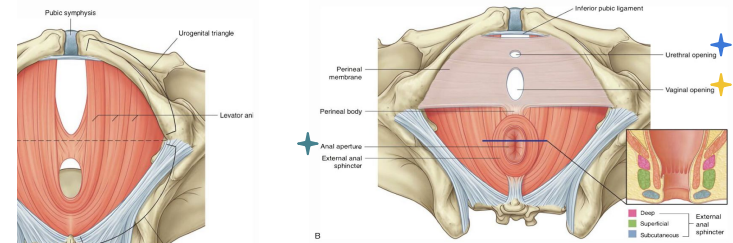
Muscles

1 Levator Ani muscles

▶ Forms:

- pelvic floor: separate pelvis from perineum
- pelvic diaphragm: traversed by urethra, vagina & rectum

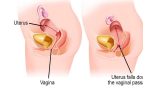
▶ Function: Support pelvic organs



Clinical anatomy : Uterine prolapse

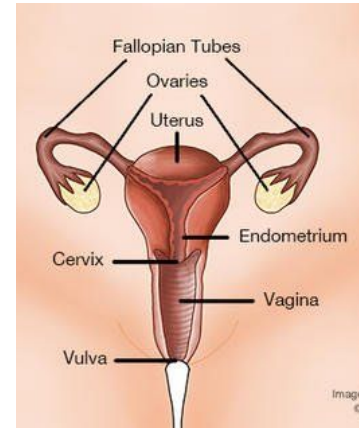
Downward displacement of uterus due to damage of:

- Ligaments of uterus
- Levator ani muscles



Vagina

- **Structure:** It's Fibromuscular tube
- **Extent:** from external os, along pelvis & perineum, to open in the vulva (female external genitalia), behind urethral opening
- **Vagina fornices (arches):** are the superior portions of the vagina, extending into the recesses created by the vaginal portion of cervix.
- **Length:** Its anterior wall (7.5 cm) is shorter than its posterior wall (9 cm) The difference in length is due to the position of uterus
- **Functions:** 1) Copulatory organ 2) Birth canal.



Relations of the vagina

Anterior

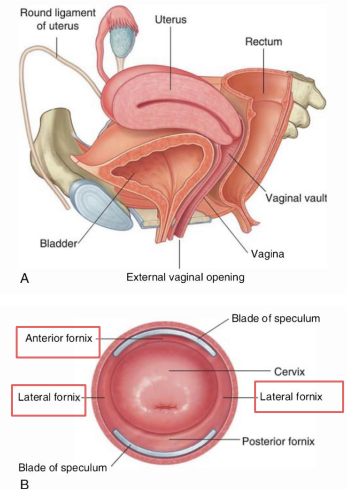
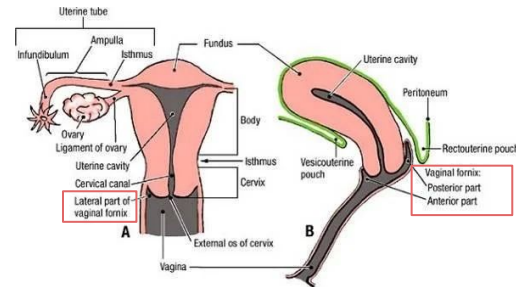
Urinary bladder (in pelvis) & urethra (in perineum)

Lateral

ureters (in pelvis)

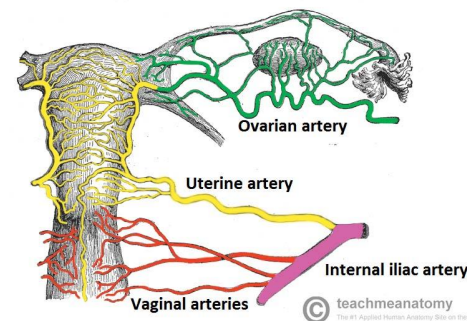
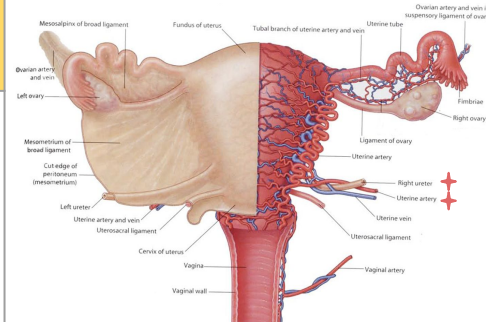
Posterior

Rectum (in pelvis) & anal canal (in perineum)



Arterial supply

Organ	Arteries	Veins	Lymphatics	Nerves (Autonomic)
Ovaries	Ovarian (branch of abdominal aorta)	Ovarian (drain to inferior vena cava & left renal vein)	To paraortic lymph nodes (in abdomen) also called the sentinel lymph nodes and are the first ones to drain a metastasizing cancer (e.g. ovarian cancer)	Ovarian plexus (in abdomen)
Uterine tubes	-Ovarian (lateral) -Uterine. (Medial)	-Ovarian -Uterine	-Paraortic -Internal iliac	-Ovarian -Inferior hypogastric
Uterus	Uterine (branch of internal iliac artery in pelvis)	Uterine plexus (drain to internal iliac vein)	To internal iliac lymph nodes (in pelvis)	Inferior hypogastric plexus (in pelvis)
Vagina	Vaginal (branch of internal iliac artery in pelvis)	Vaginal plexus (drain to internal iliac vein)		



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Uterine artery passes from the internal iliac artery and crosses **above the ureter** and reaches the cervix at the level of external os this is important clinically for the surgeon when performing hysterectomy to differentiate and distinguish between the uterine artery and the ureter.

mnemonic= "**Water under the bridge**" means: water (urine=ureter) is inferior to the bridge (uterine artery)

Remember: the supply to the ovaries and part of uterine tubes is always from the abdomen (abdominal aorta).

While the supply of the uterus and vagina and part of the uterine tubes is always from the pelvis (internal iliac artery).



QUIZ

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
D	A	A	B	C	C	A	A

Q1: Regarding the female reproductive organs, which one of this statement is correct?

- A. The ampulla is the most medial part of the uterine tube.
- B. The rectum is anterior to the vagina.
- C. The ovarian artery is a branch of the internal iliac artery of the pelvis.
- D. The uterine tube is enclosed in the broad ligament of the uterus.

Q2: Which one of the following structures is related to the lateral end of the ovary?

- A. Fimbriae of uterine tube
- B. Ampulla of uterine tube
- C. Ligament of ovary
- D. Round ligament of uterus

Q3: Which one of the following structures is anterior to the uterus?

- A. Urinary bladder
- B. Ureter
- C. Sigmoid colon
- D. Ovary

Q4: Which of the following is supplied by the ovarian artery?

- A. Ovaries & uterus
- B. Ovaries & uterine tubes
- C. Uterine tubes & uterus
- D. Uterus & vagina

Q5: Which of the following parts is the site of fertilization?

- A. Intramural part
- B. Isthmus
- C. Ampulla
- D. Infundibulum

Q6: Production of female germ cells is the function of which of the following?

- A. Vagina
- B. Uterus
- C. Ovaries
- D. Uterine tubes

Q7: Which groups of lymph nodes are the sentinel nodes in cases of ovarian cancer?

- A. Paraaortic
- B. Uterus node
- C. External iliac
- D. Superficial inguinal

Q8: Which one of the following structures is lateral to the Vagina?

- A. Ureter
- B. Uterus
- C. Ovaries
- D. Uterine tubes



Members board



Team leaders

- **Abdulrahman Shadid**

Boys team:

- **Mohammed Al-huqbani**
- **Salman Alagla**
- **Ziyad Al-jofan**
- **Ali Aldawood**
- **Khalid Nagshabandi**
- **Sameh nuser**
- **Abdullah Basamh**
- **Alwaleed Alsaleh**
- **Mohaned Makkawi**
- **Abdullah Alghamdi**



- **Ateen Almutairi**

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- **Ajeed Al Rashoud**
- **Taif Alotaibi**
- **Noura Al Turki**
-  **Amirah Al-Zahrani**
- **Alhanouf Al-haluli**
- **Sara Al-Abdulkarem**
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