Female Genital Organs

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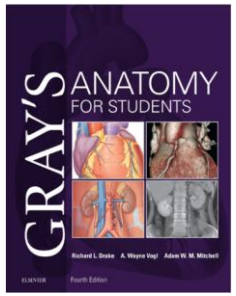

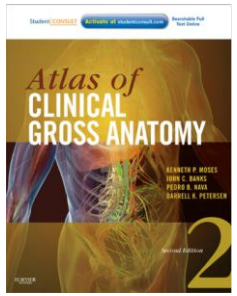

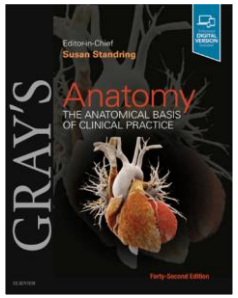

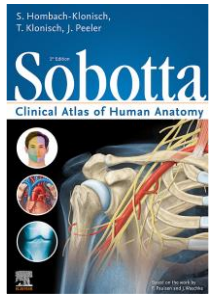

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Introduction, ie. What is this good for?!

Dear students, colleagues,

This study material is a supporting aid to our anatomy practicals, its goal is to understand and consolidate the discussed matter, clinical implications including. Knowledge practice is based on supplementary questions and tasks, you can check your answers on the next slide/s.

I wish you good luck and joy from new knowledge,

Lada Eberlova

The following pictograms will accompany you:

 to recall or remember

 clinical notes

 to be completed

Recommendation: Find the most effective way of learning that works for you. Study regularly, most often every day, and discuss the matter with your mates. Do not be afraid to ask so that SDA is not SAD when the time comes...

Learning goals

i.e. What do you FINALLY need to know?

- Knowledge demands for the spot test/s
- **Knowledge requests for the final exam (oral!)**

Female genital organs

...

Glands and pathways – their relation to the peritoneal cavity, organ syntopy; the broad ligament

Ovaries – gross anatomy and the cross-section, ovarian cycle

Fallopian tubes – parts, layers, orifices

Uterus - parts, layers, orifice/s; menstrual cycle, para- and perimetrium; position in pelvis, peritoneal pouches, levator ani muscle

Vagina – layers, vestibule, fornices, hymen,

External genitalia – structures, major vestibular glands, clitoris

...

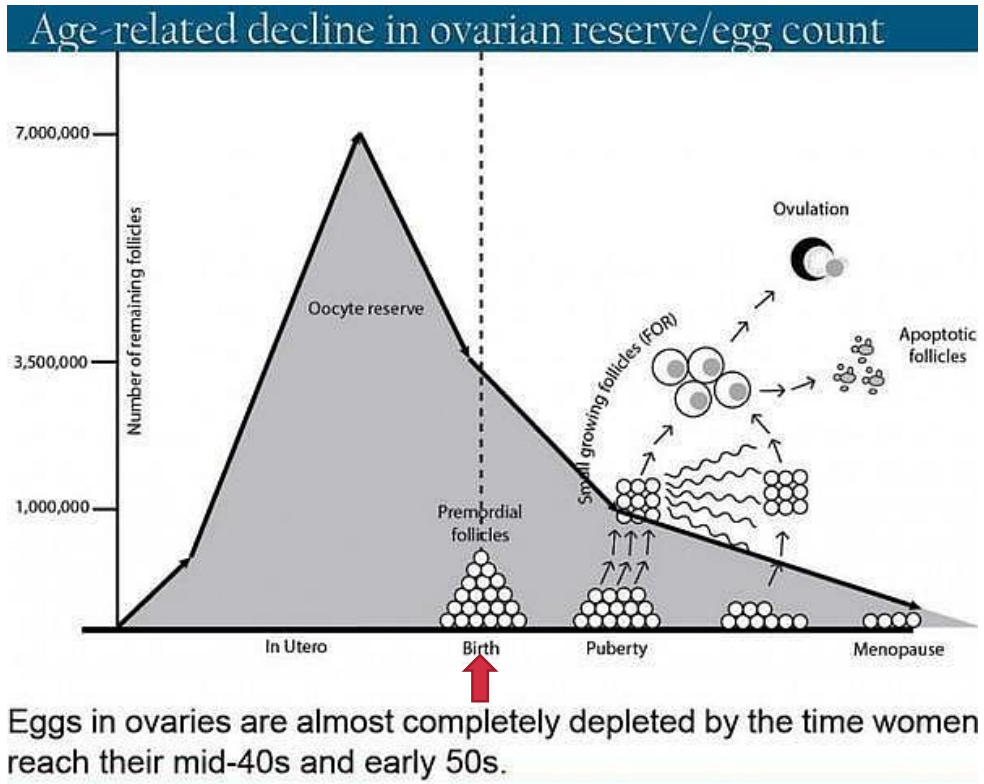
Hollow organs, description algorithm

- From:
- To:
- Where:
- Parts:
- Layers:
- Function:
- Relation to the serosa:
- Organs syntopy (relation to the surroundings):
- Blood supply, innervation, lymph drainage

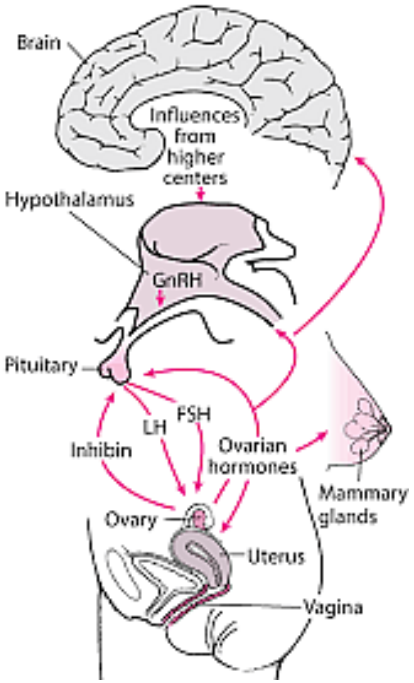
https://kahoot.com/

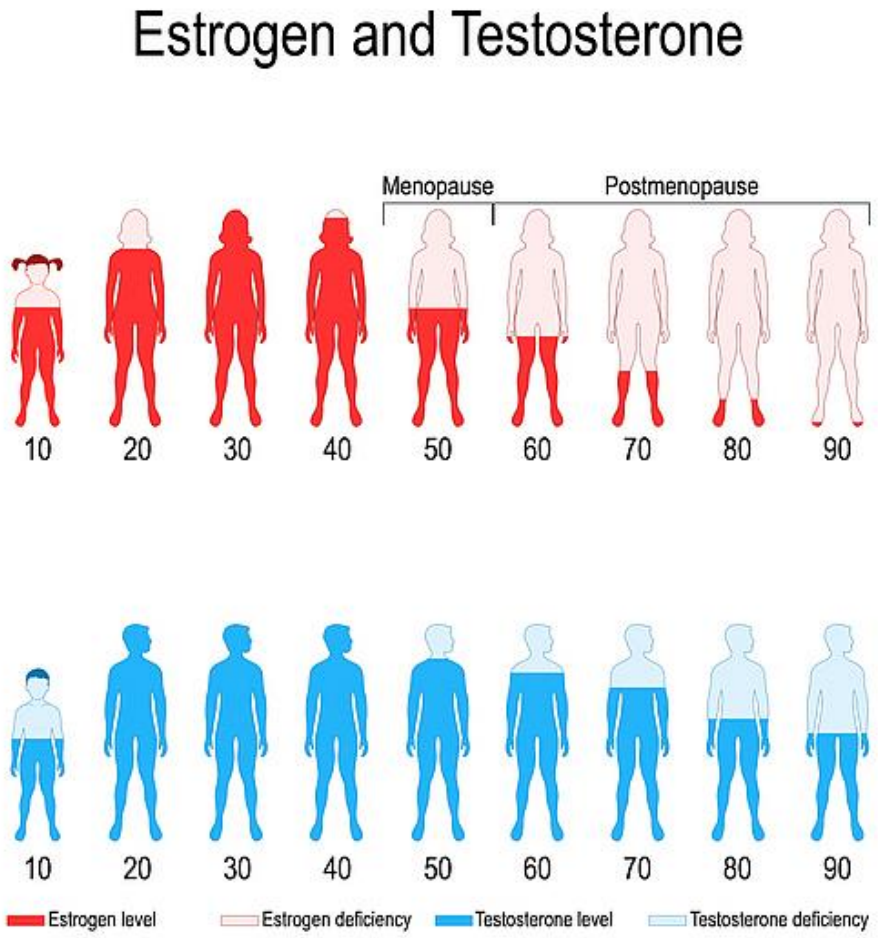
Revision
Try on your own: considering the algorithm, describe the spermatic cord and male urethra.

Female genital organs



https://www.centerforhumanreprod.com/blog/female-age-and-fertility-why-age-is-the-most-important-pregnancy-predictor





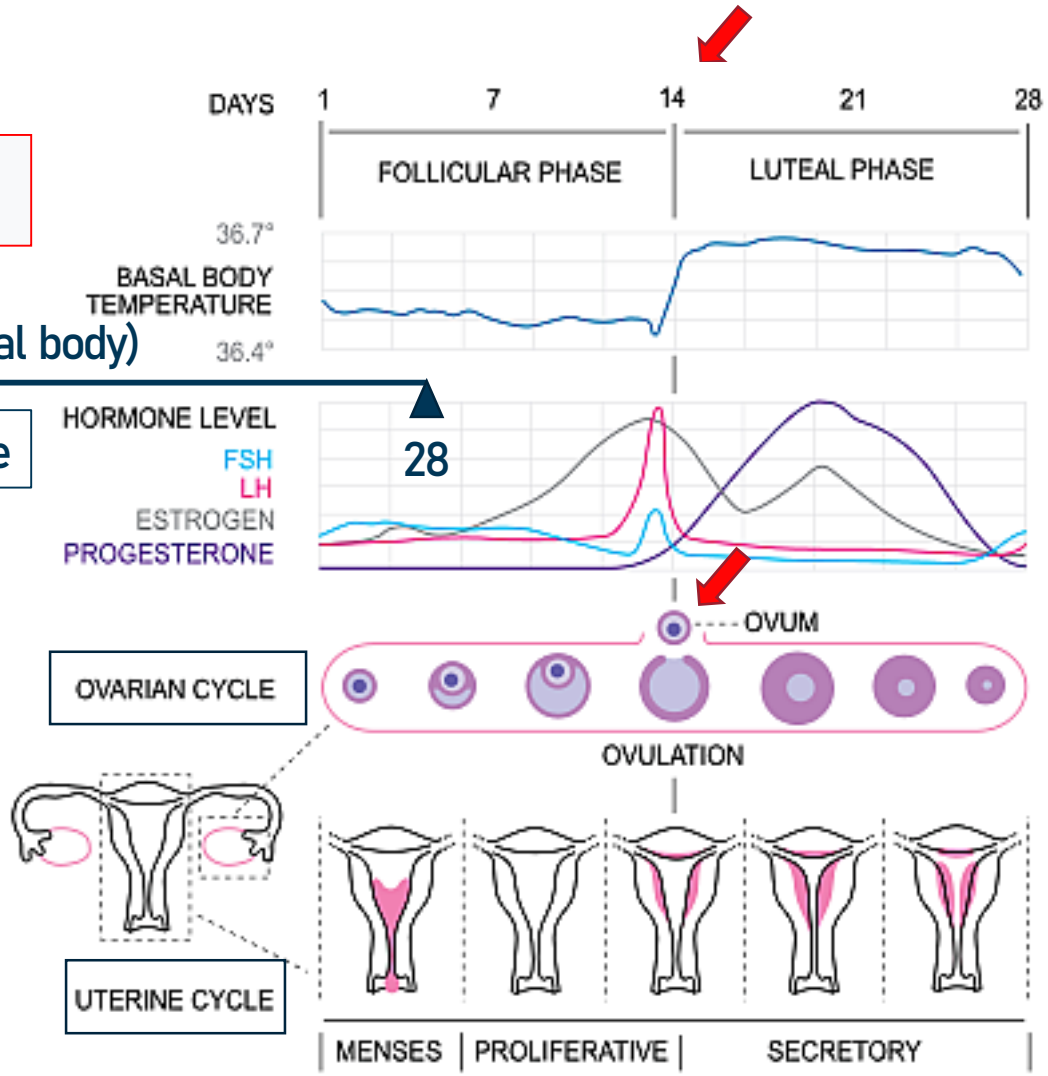
„...**Women are born with, likely all of their eggs, and constantly lose some** when they are recruited from their resting stage (in primordial follicles) into a maturation process called folliculogenesis that lasts up to three to four months. As women age, their ovaries, therefore, contain fewer and fewer eggs. As a consequence, the number of eggs recruited into maturation declines. Declining egg numbers, therefore, unquestionably, are one factor that contributes to declining fertility. ...“

Female hormonal cycle

Natural contraception:
Gamets life span and presence: unprotected intercourse + ovulation

estrogens (Graafian folicle) **progesteron** (luteal body)

1 — Folicular phase — 14 ovulation — Lutheal phase — 28



Sex hormones cyclicly influence all tissues with corresponding receptors! Except for the ovaries)in ovarian cycle) and uterus (in the menstrual or cervical glands cycle) we can see changes also in the mammary gland and vagina.

Fertilization

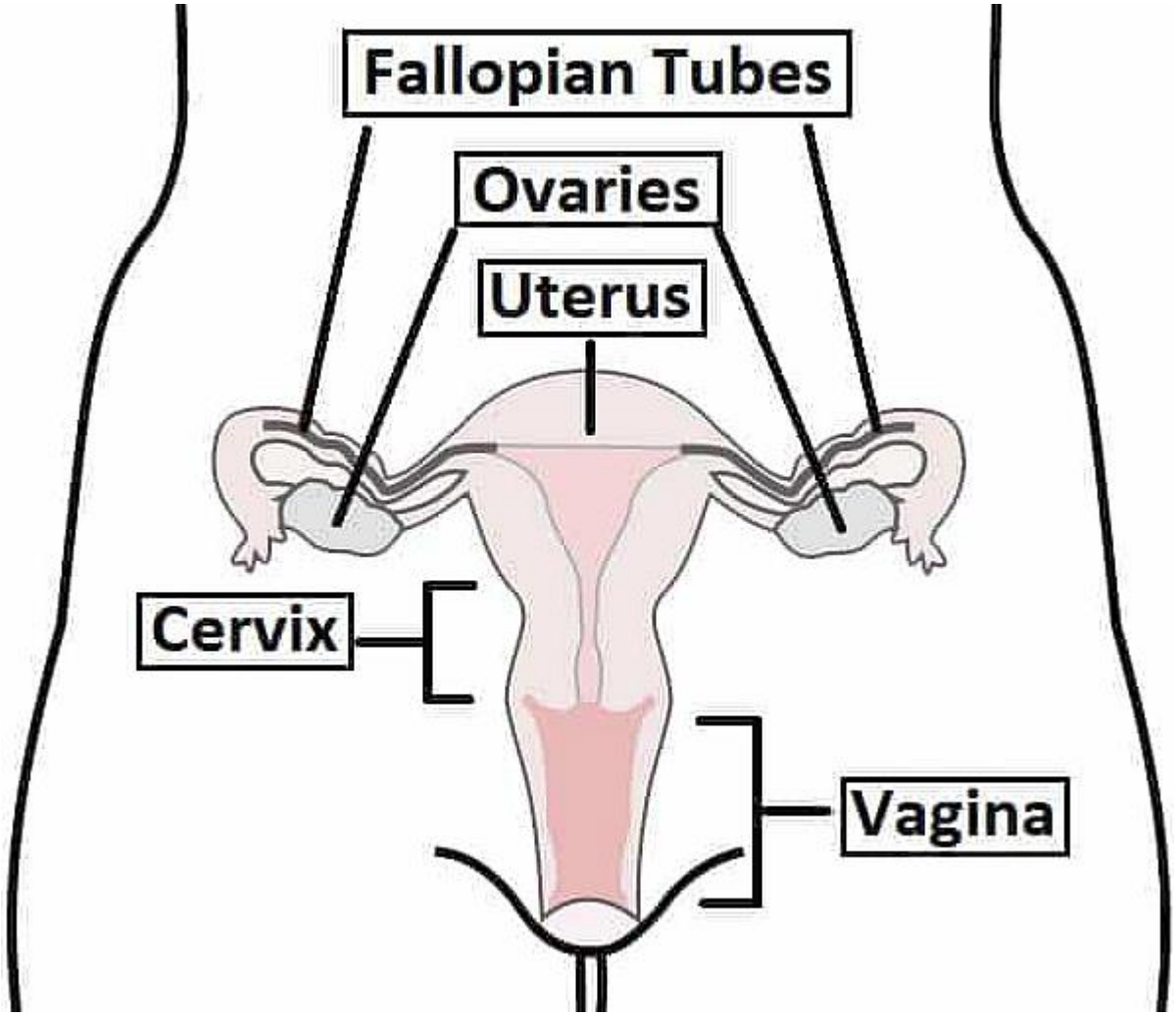
https://www.youtube.com/watch?v=_5OvgQW6FG4&t=18s&ab_channel=NucleusMedicalMedia

Female genital organs

Gonads: Ovary

Internal genitals:
Uterine tubes, uterus, vagina

External genitals:
Mons pubis, labia majora, labia minora, bulb of vestibule, clitoris, greater vestilbular gland, vestibule of vagina



Intraperitoneally: Ovaries, uterine tubes, most of the uterus

Broad ligament, pelvic peritoneum

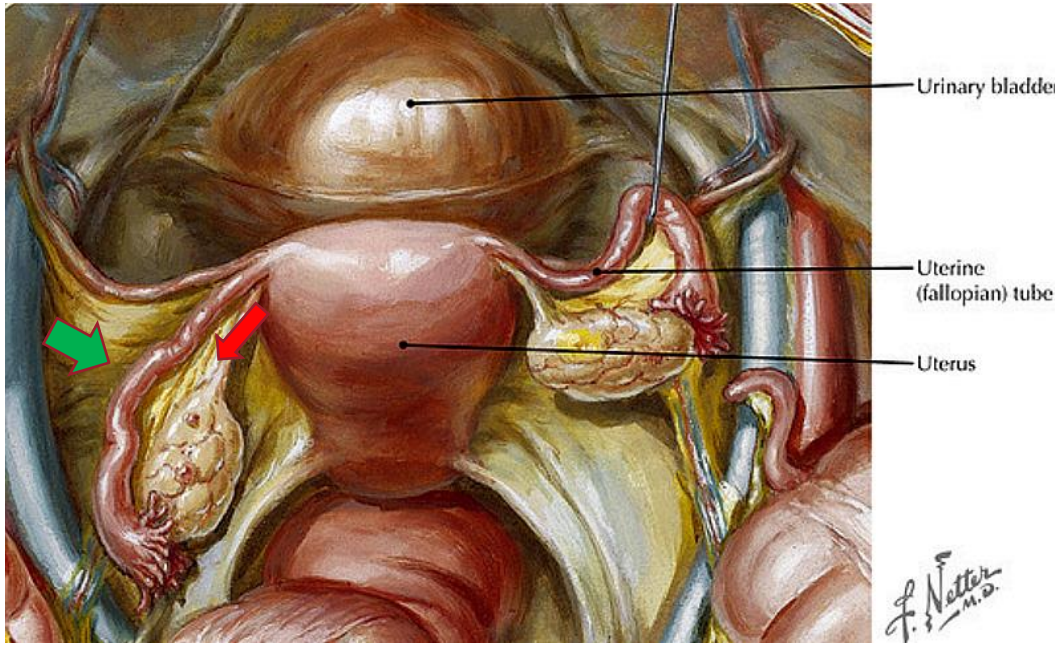


Fig.: Female genital organs, the broad ligament – part of the peritoneum; mesosalpinx (green arrow), mesovary (red arrow)

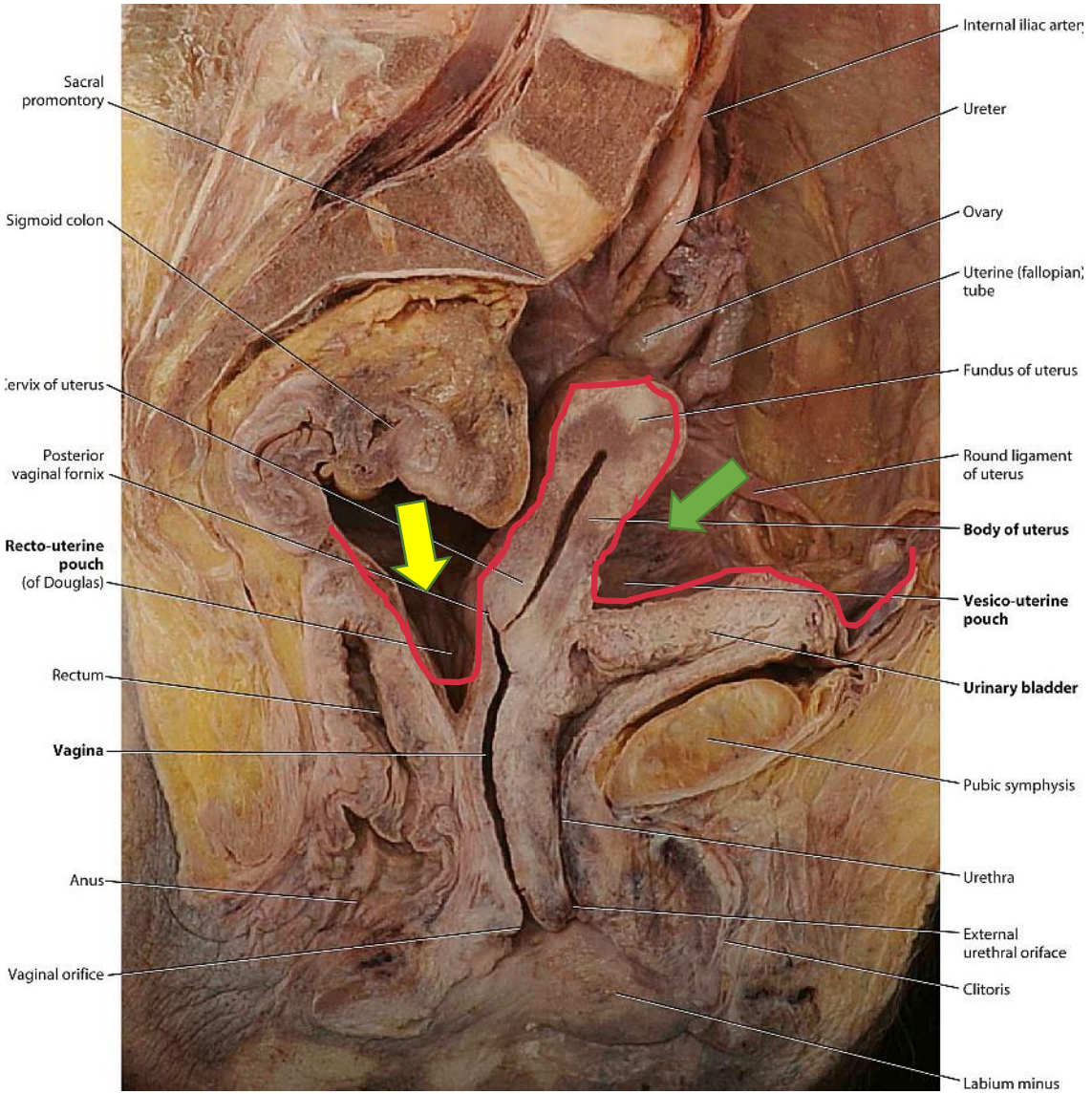
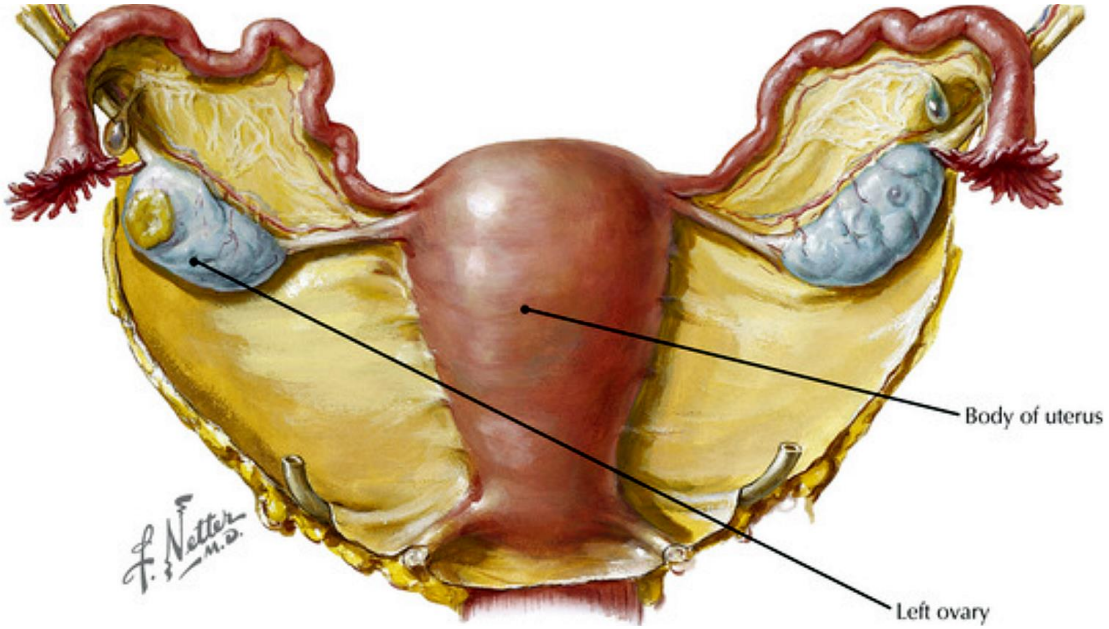


Fig.: Female pelvic viscera and peritoneum (red) — paramedian sagittal section; vesicouterine pouch (green arrow), rectouterine pouch = Douglas space (yellow arrow)

Female genital organs



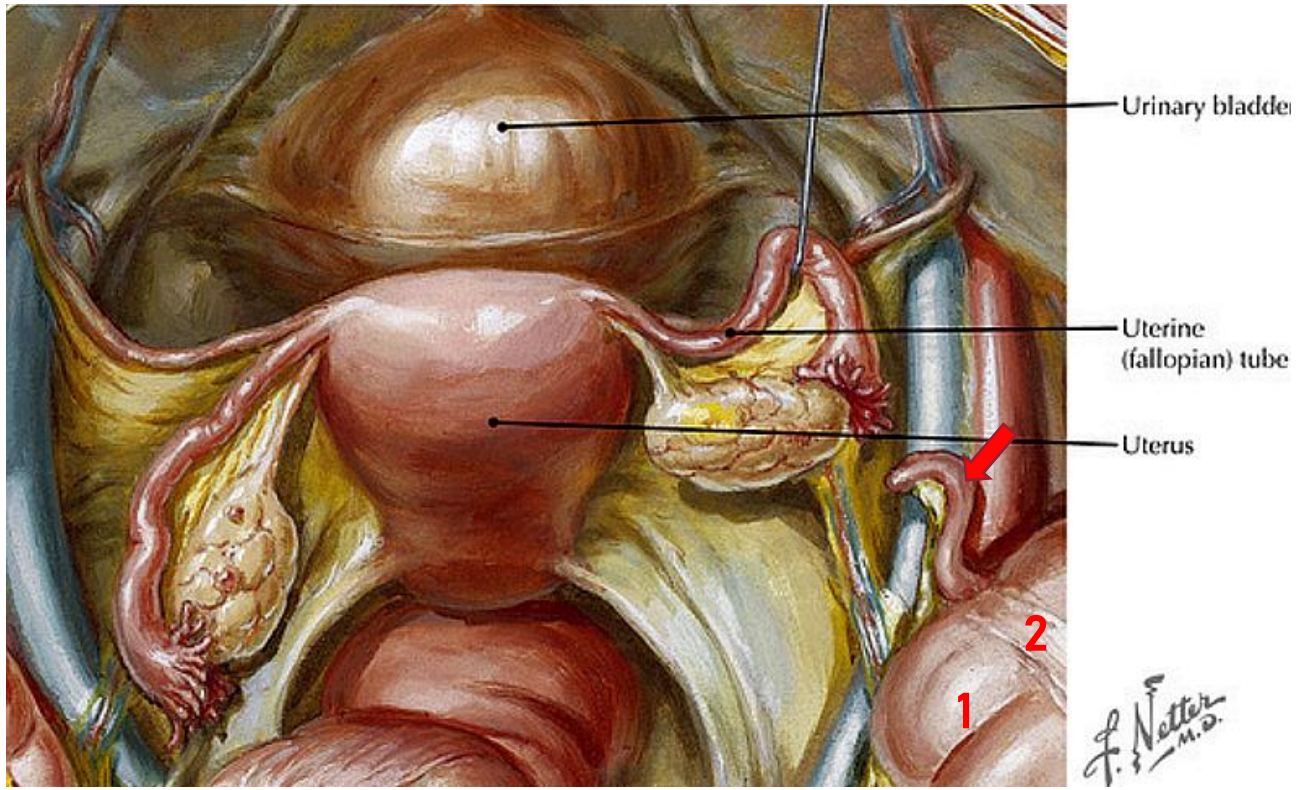


Fig.: Ovaries and broad ligament, view into pelvis from above and behind; notice the position of appendix (red arrow)

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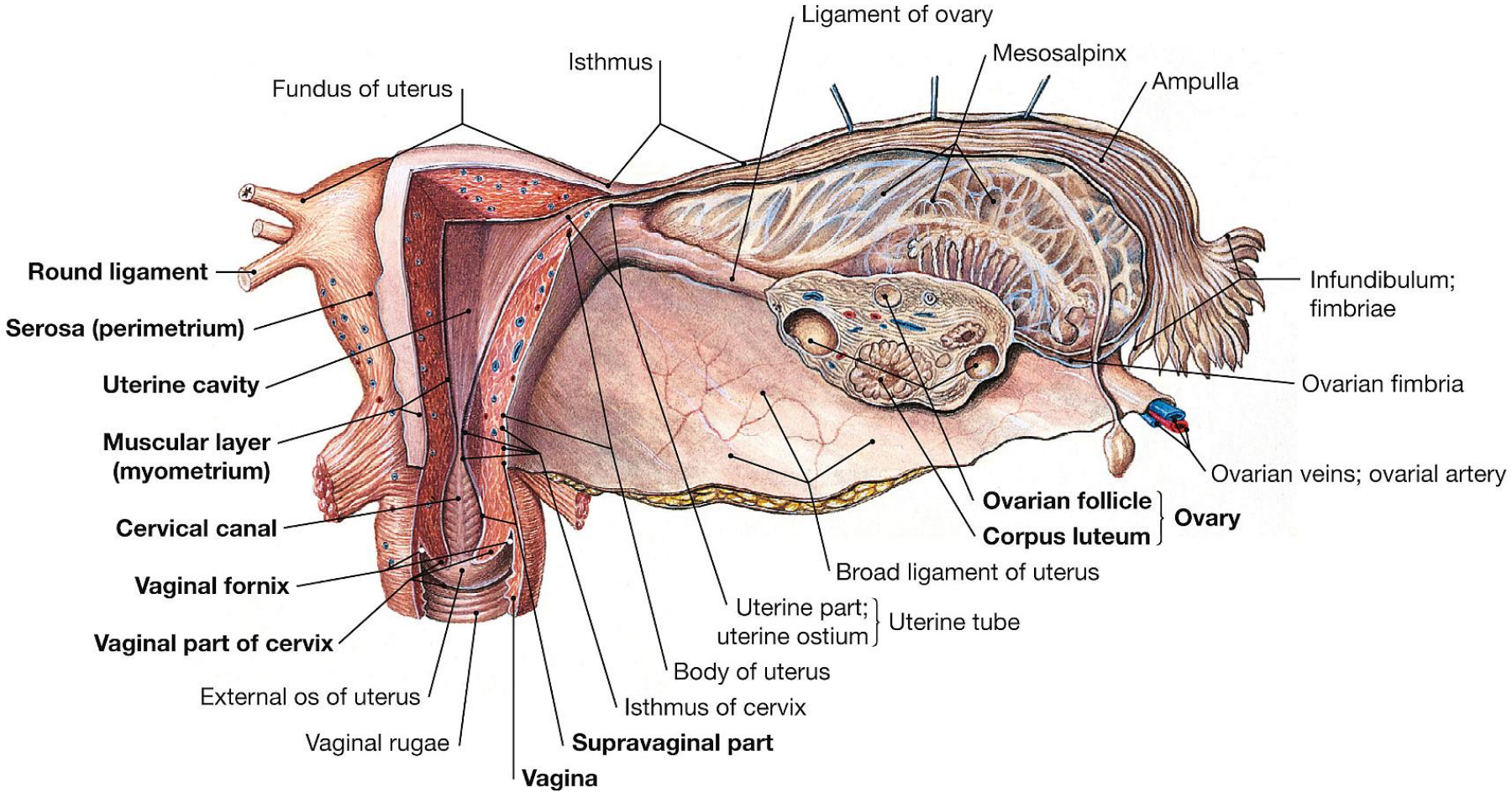
Fig.: Uterus. Anterior view. **Uterine adnexa: ovaries + fallopean tubes**

OVARIES

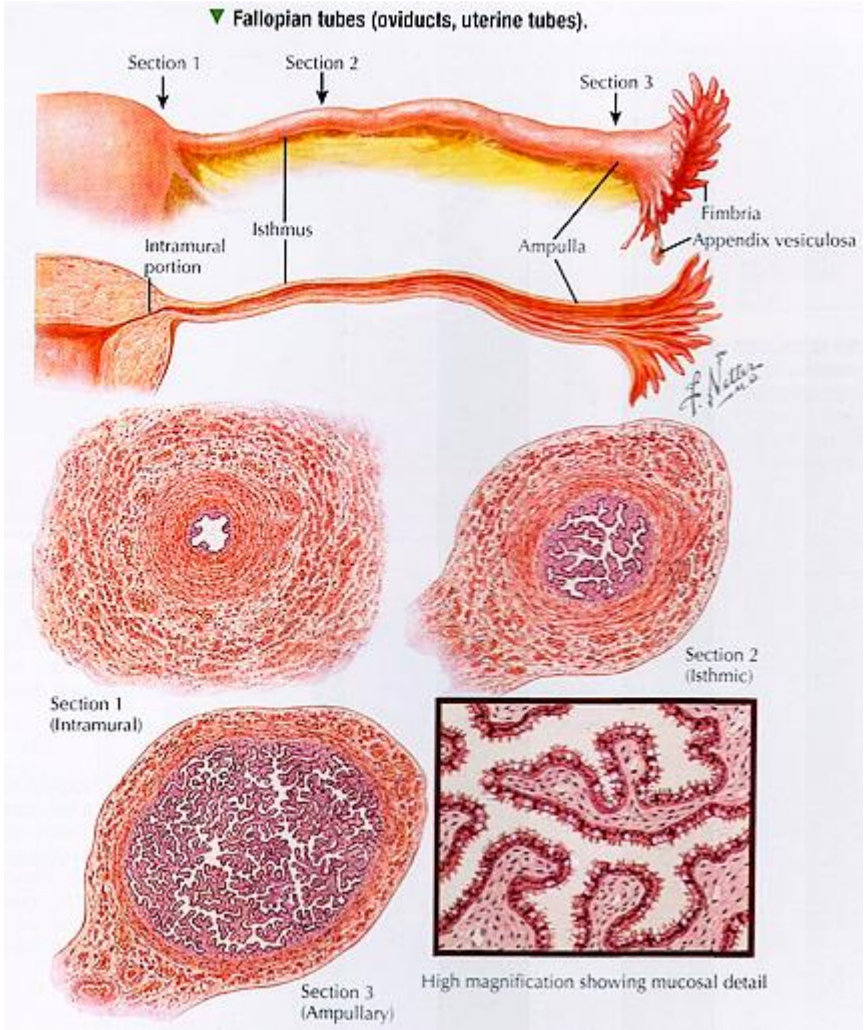


Extremities: tubal, uterine
Hilum – mesovarium
Ligaments: ovarian (proper) and suspensory
Cortex, medulla
INTRAPERITONEAL ORGAN

UTERINE TUBES

- **From:** abdominal orifice
- **To:** uterinr orifice
- **Where:** extend from each side of the superior end of the body of the uterus to the lateral pelvic wall and are enclosed within the upper margins of the mesosalpinx portions of the broad ligament
- **Parts:** infumdibulum, ampulla, isthmus
- **Structures:** infundibulum, fimbriae, mucosal folds
- **Layers:** mucosa, submucosa, muscular layer, serosa
- **Function:** transport
- **Relation to the serosa: INTRAPWRITONEAL**
- **Organs syntopy (relation to the surroundings):**

The cornua of the uterine cavity lead to the fallopian tubes.
- The uterine tubes can be very mobile.
- The fimbriated ends of the uterine tubes open to the peritoneal cavity.



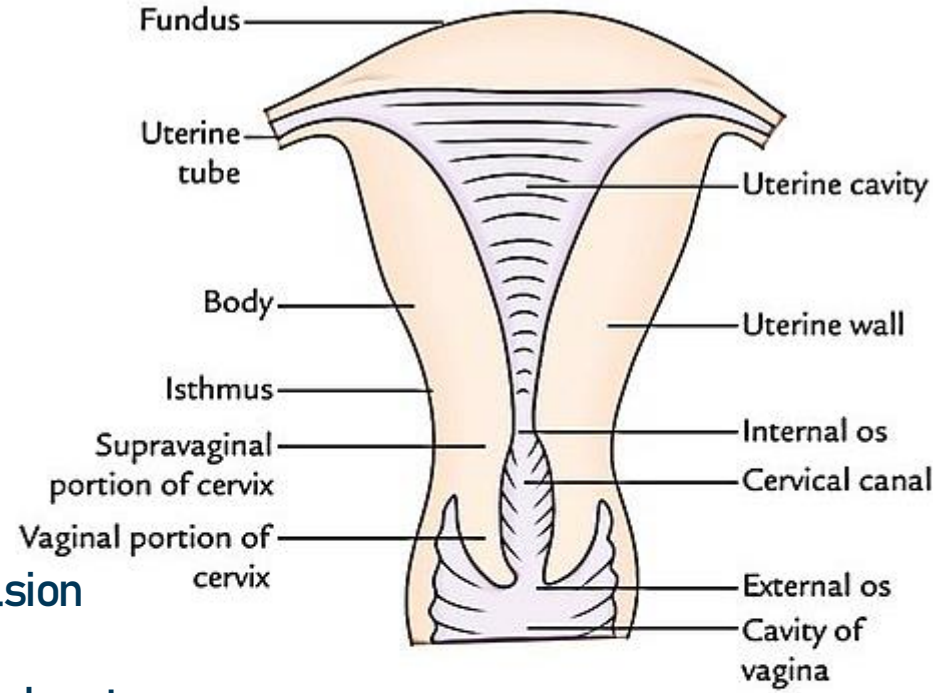
Clinical Note

Ligation of the uterine (fallopian) tubes (tubal ligation), once a common surgical procedure for elective sterilization, now is often done with devices inserted into the uterine tubes during hysteroscopy.

UTERUS

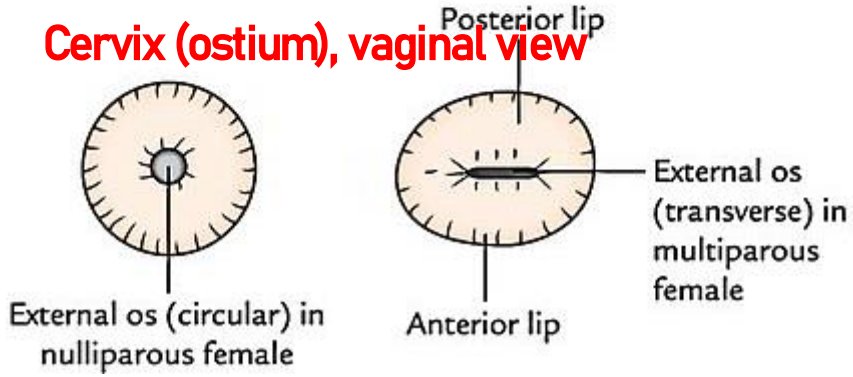
pear-shaped musclular, hollow organ, about 7 cm long in adult female

- **From:**
- **To:**
- **Where:** True pelvis
- **Parts:**
- **Layers:** see the next slide
- **Function:** Implantation of the blastocyst , fetus development and expulsion
- **Relation to the serosa:** most covered by serosa
- **Organs syntopy (relation to the surroundings):** between the bladder and rectum



Structures:
Body: horns, fundus, cavity, margins; intestinal and vesical surface
Cervix: canal, supra-/vaginal part, cervical ostium
Isthmus: segment between the body and isthmus

Cervix (ostium), vaginal view



Uterus is physiologically relatively movable organ, flexion, version, position can be assessed.

UTERUS, *metra*

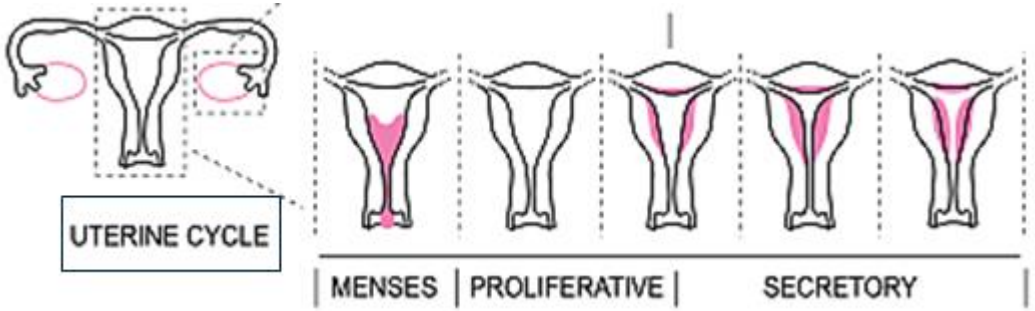
Endo-
Myo-
Para-
Peri-
METRIUM

Mucosa – menstrual cycle
Smooth musculature – 3 layers
Parametrium = subserosa, supporting ligaments (CF m. levator ani!)
Perimetrium = peritoneum = broad ligament of the uterus

Endometrium – functional and basal zone; cyclical changes = **menstrual cycle**:
desquamation, regeneration, proliferation, secretion

Menstrual cycle

https://www.youtube.com/watch?v=42WIByexiXc&ab_channel=DandelionMedicalAnimation



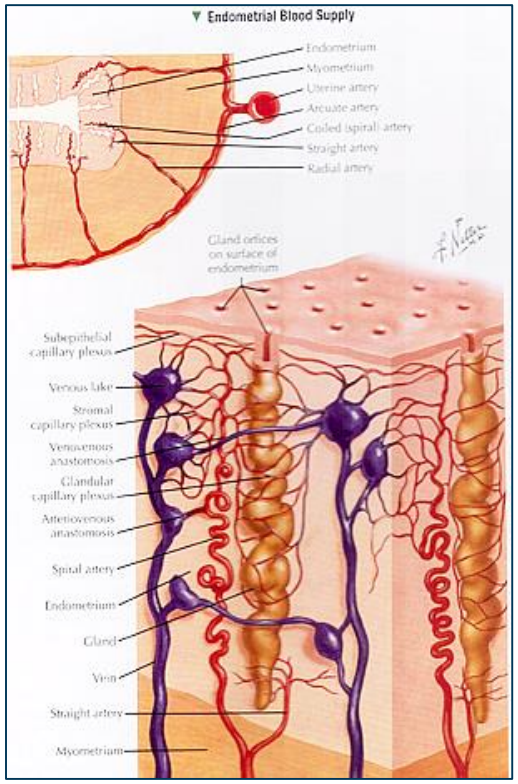
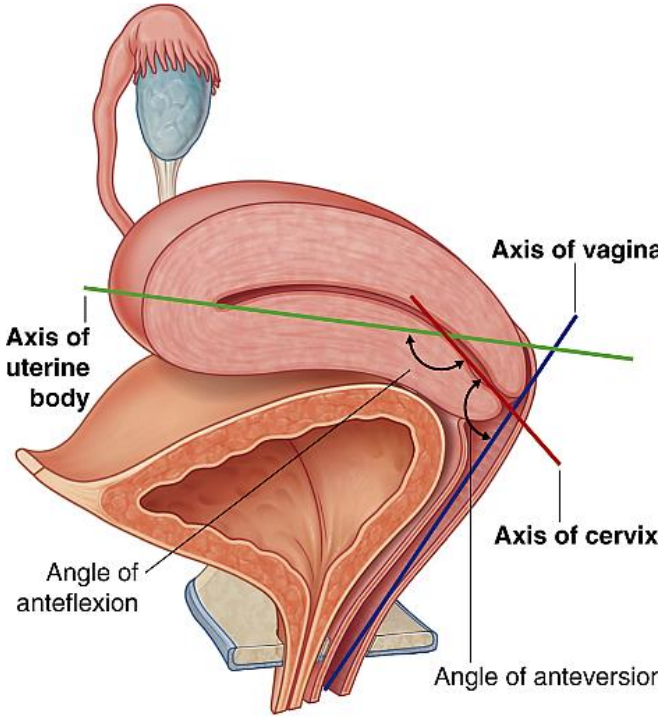
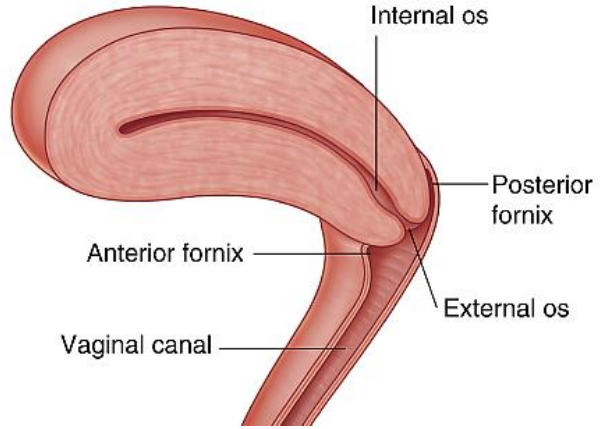


Fig.: **Endometrial** blood supply



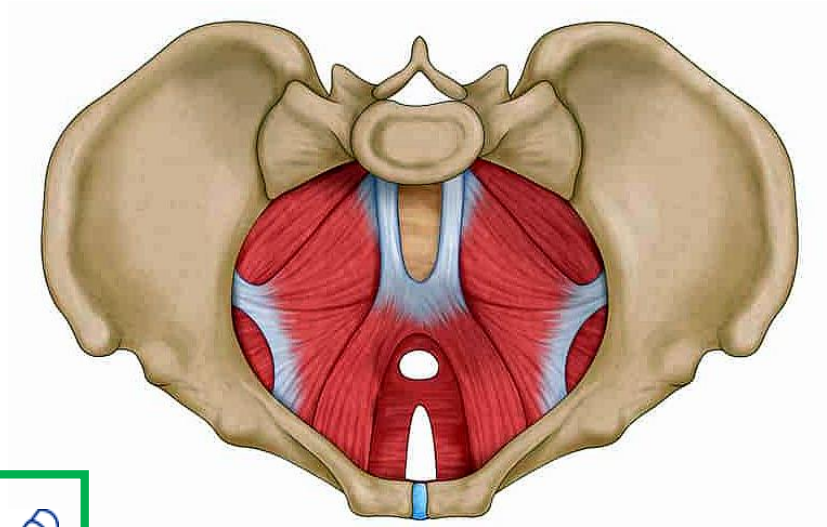


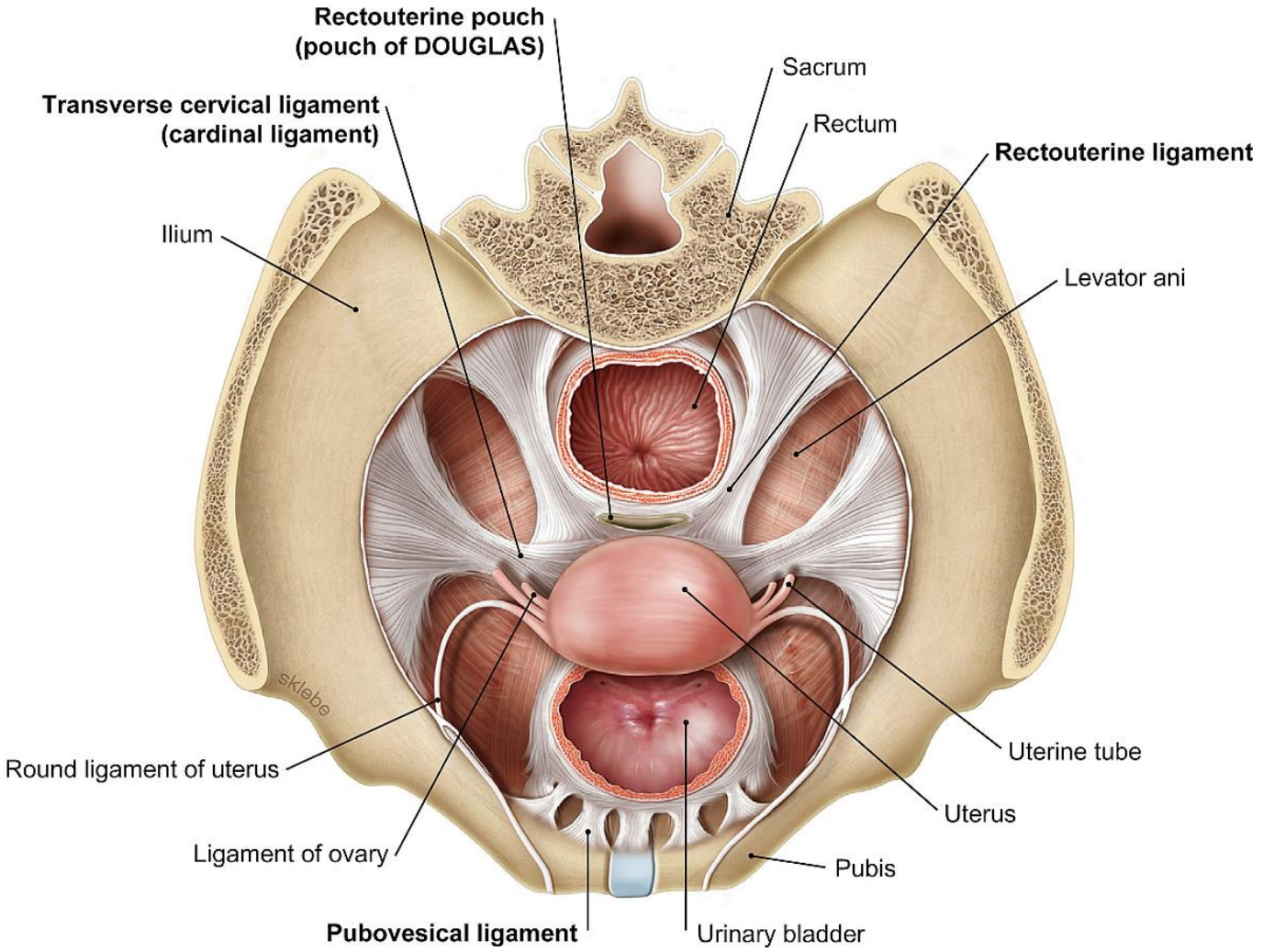
Position: anteversion, anteflexion

UTERUS, fixation ligaments

- Pubovesical – vesicouterine lig.
- Rectovesical lig.
- Cardinal ligg.
- Round lig.

LEVATOR ANI m.

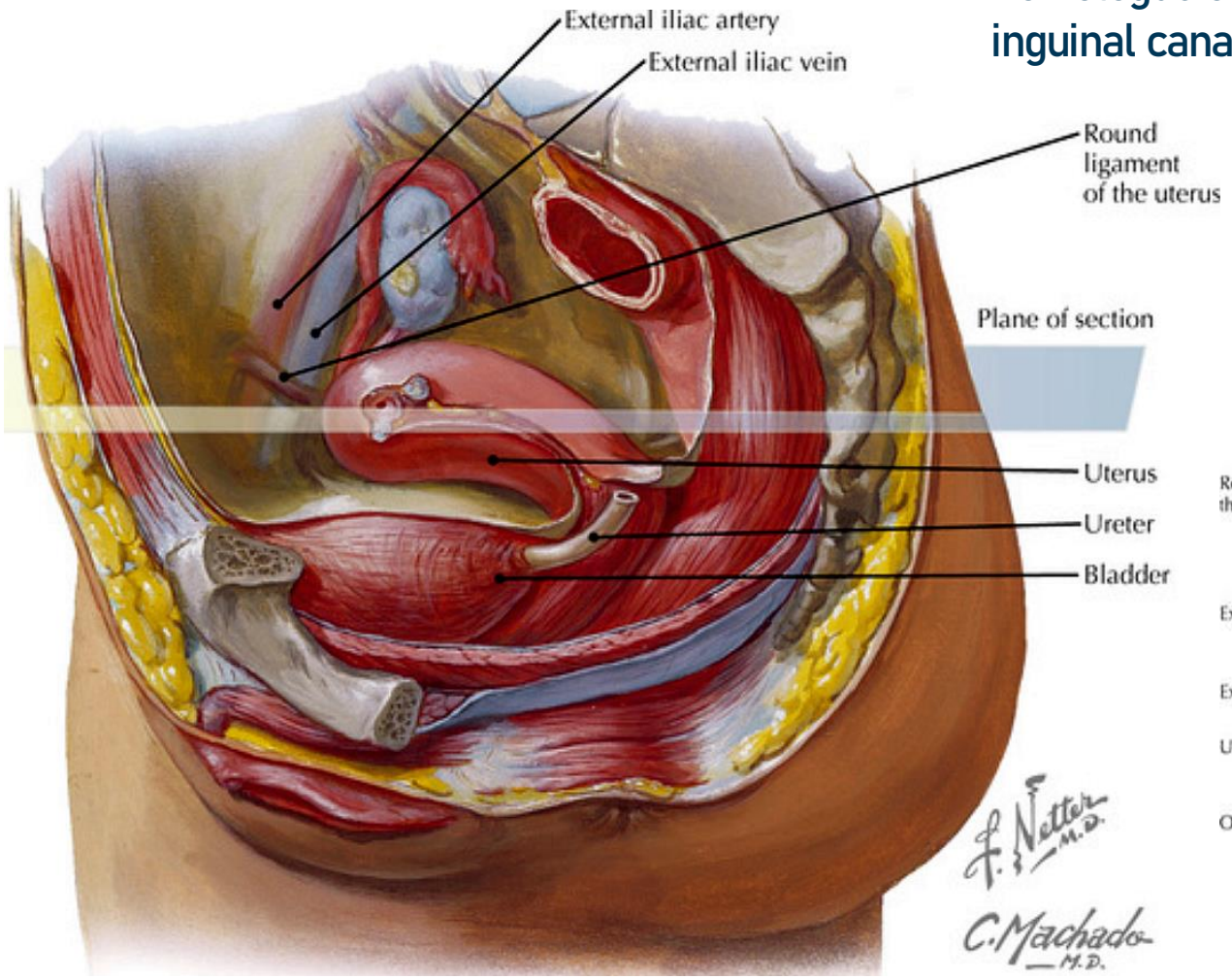




Parametrium
Extra- (sub-)peritoneal pelvic attachments of the uterus; superior view. Connective tissue attachments in the subperitoneal pelvic fascia **stabilize the cervix** and support the uterus in the pelvis

Round ligament of the uterus

Homologue of the male gubernaculum of testis: passes through the inguinal canal, from the uterine horns to labia majora.



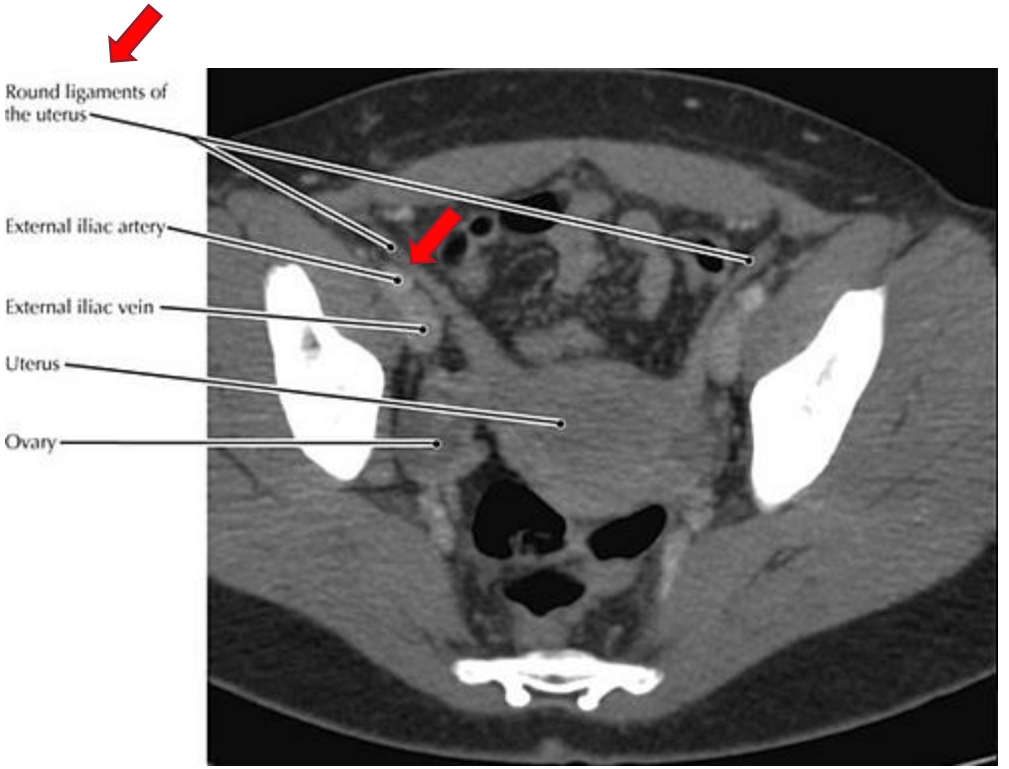
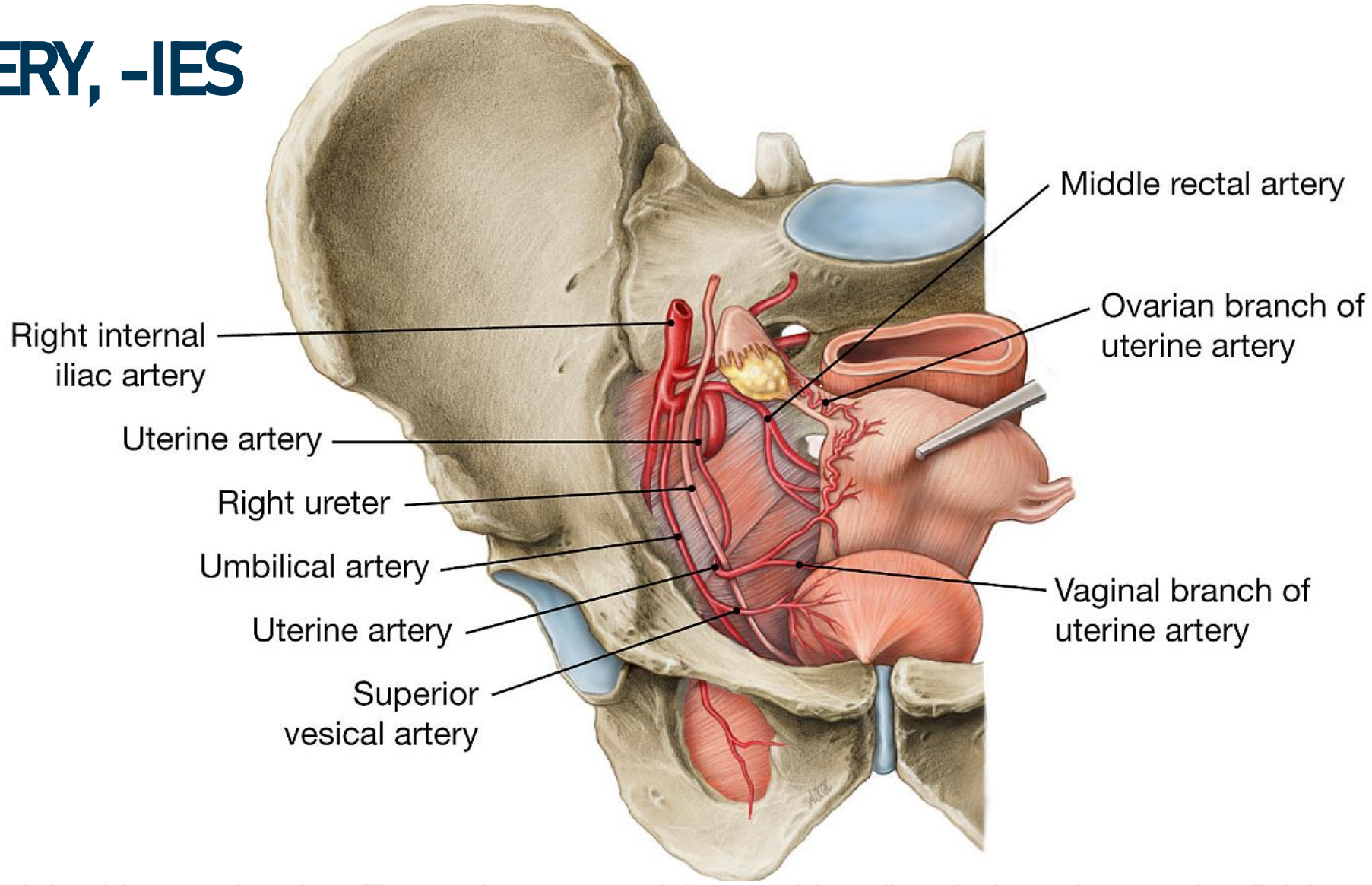


Fig.: Parasagittal view of the female pelvic viscera

UTERINE ARTERY, -IES



Course of the uterine artery; right side; anterior view. The uterine artery originates either directly from the anterior division of the internal iliac artery or from the umbilical artery. It travels at the base of the broad ligament to reach the uterus at the body-to-cervix transition. It ascends to the fundus along the lateral side of the body of the uterus and **gives rise to the tubal and ovarian branches**. In the pelvic fascia, the **uterine artery crosses over the distal ureter**.

Male and female organ homologues (analogues)

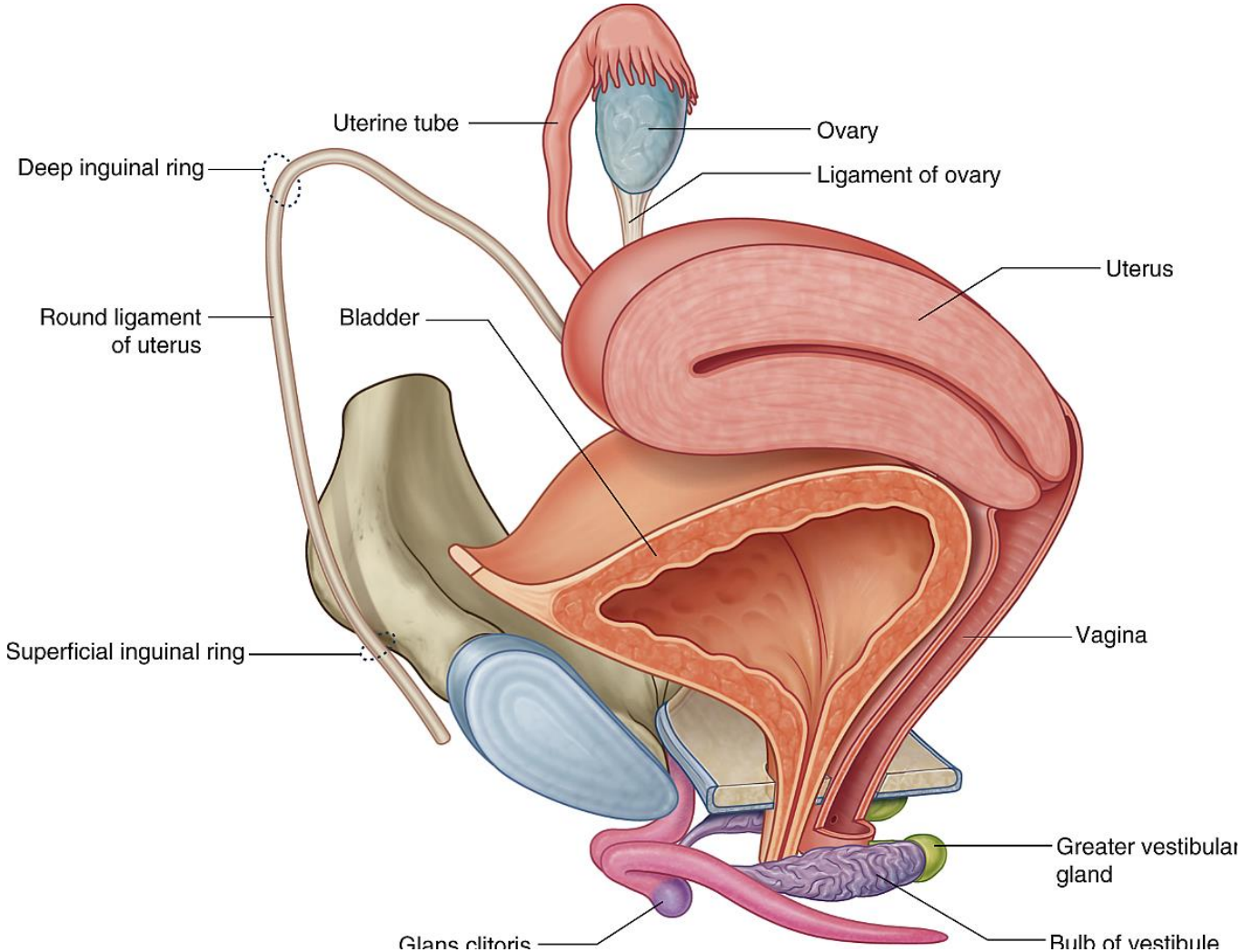


Fig.: Reproductive system in women.

Male	Female
Testis	**Ovary**
Appendix testis	Fallopian tubes
Prostatic utricle	Uterus, upper vagina
Bulbourethral gland (Cowper´s)	Greater vestibular gland (Bartholin's gland)
Scrotum	Labia majora
Spongy part of urethra	Labia minora
Penis	Clitoris
Processus vaginalis	Canal of Nuck
Bulb of penis (spongy body)	Vestibular bulbs
Gubernaculum testis	Round ligament of uterus

Male and female organ homologues (analogues)

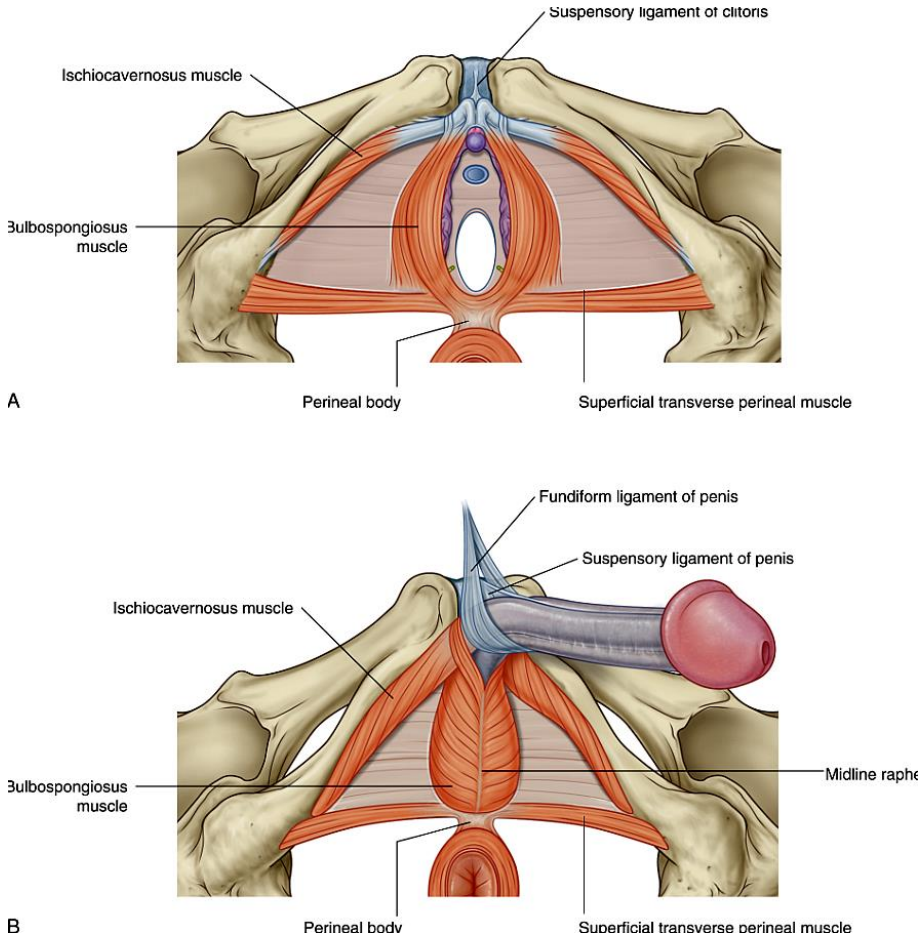


Fig.: Muscles in the superficial perineal pouch. A. In women. B. In men.

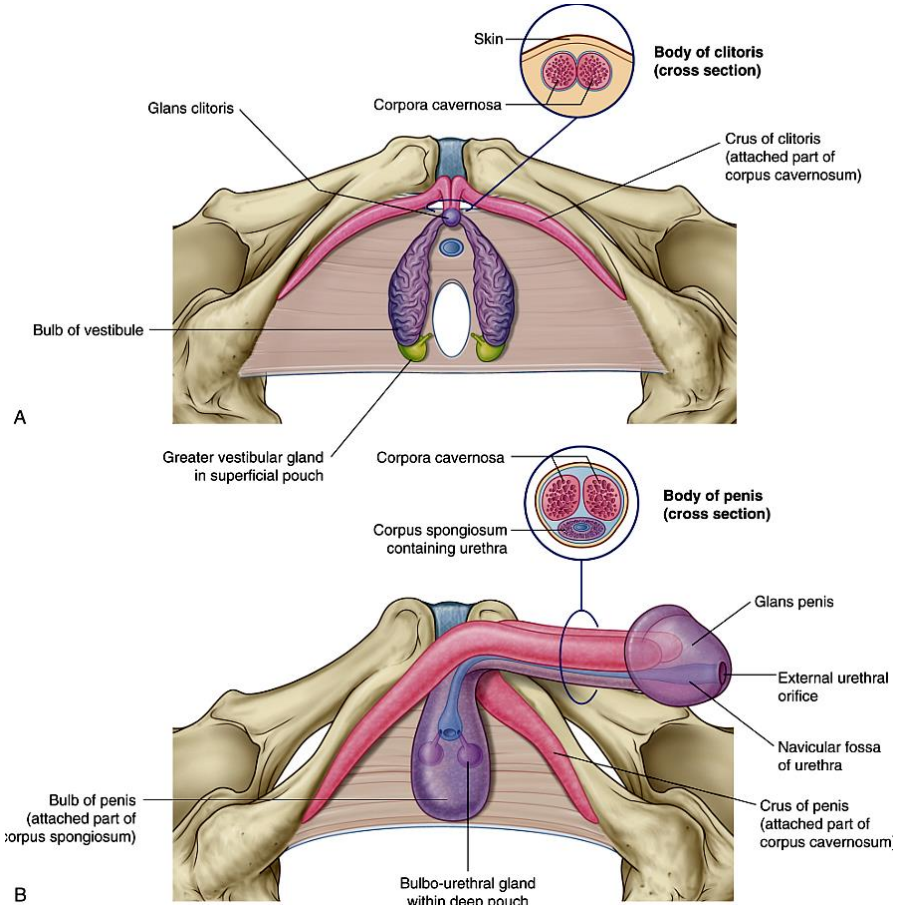


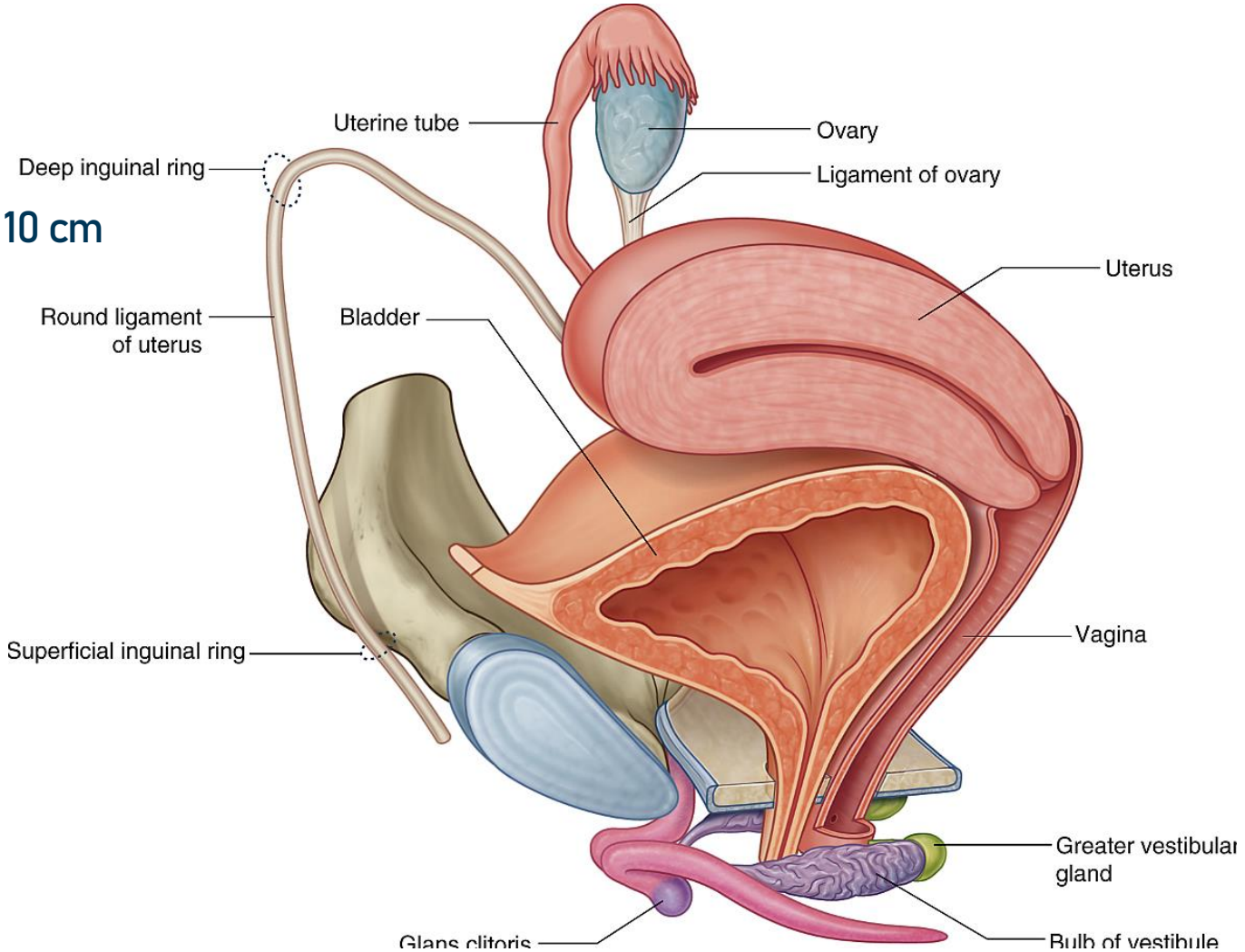
Fig.: Erectile tissues of clitoris and penis. A. Clitoris. B. Penis.

VAGINA

Flat thin-walled musculocutaneous organ, 8 – 10 cm

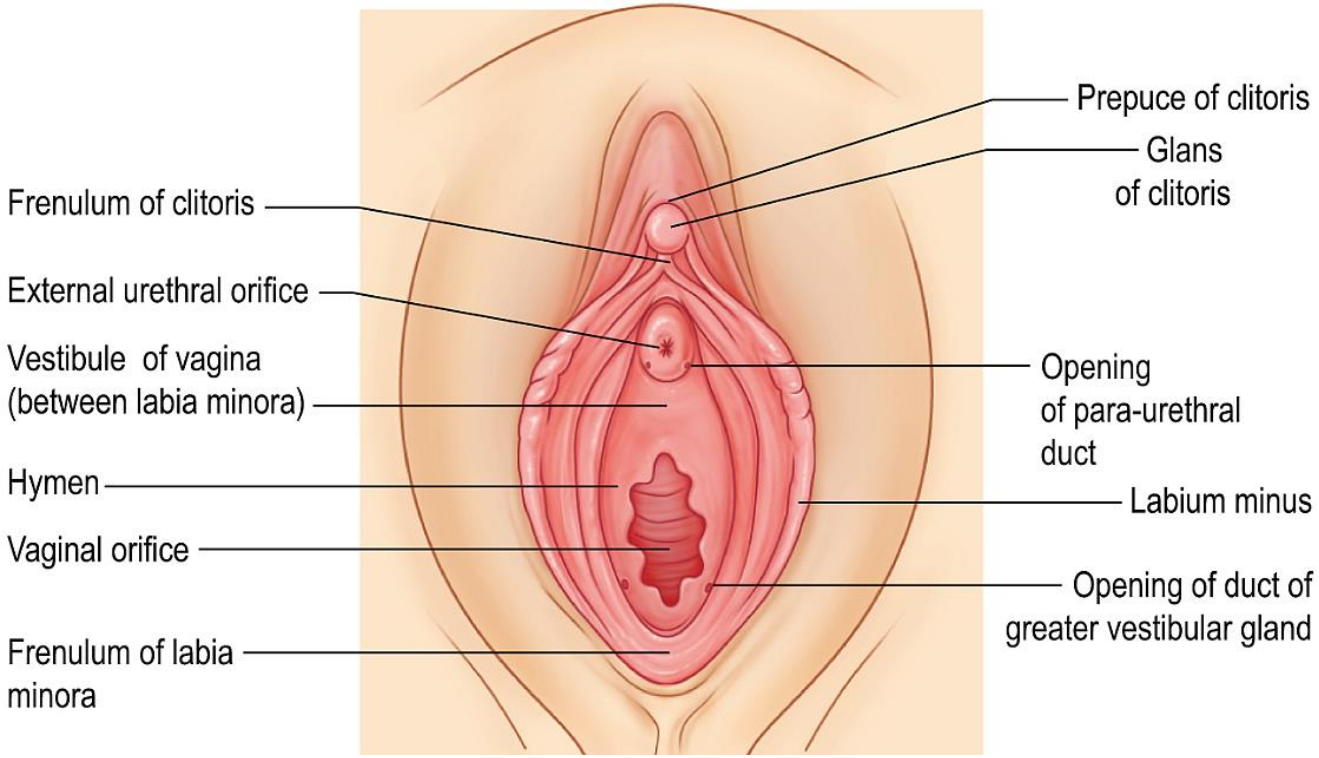
From fornices to vestibule of vagina (orifice)
Mucosal folds – rugae
Muscular layer
Adventitia

HYMEN



External genitals

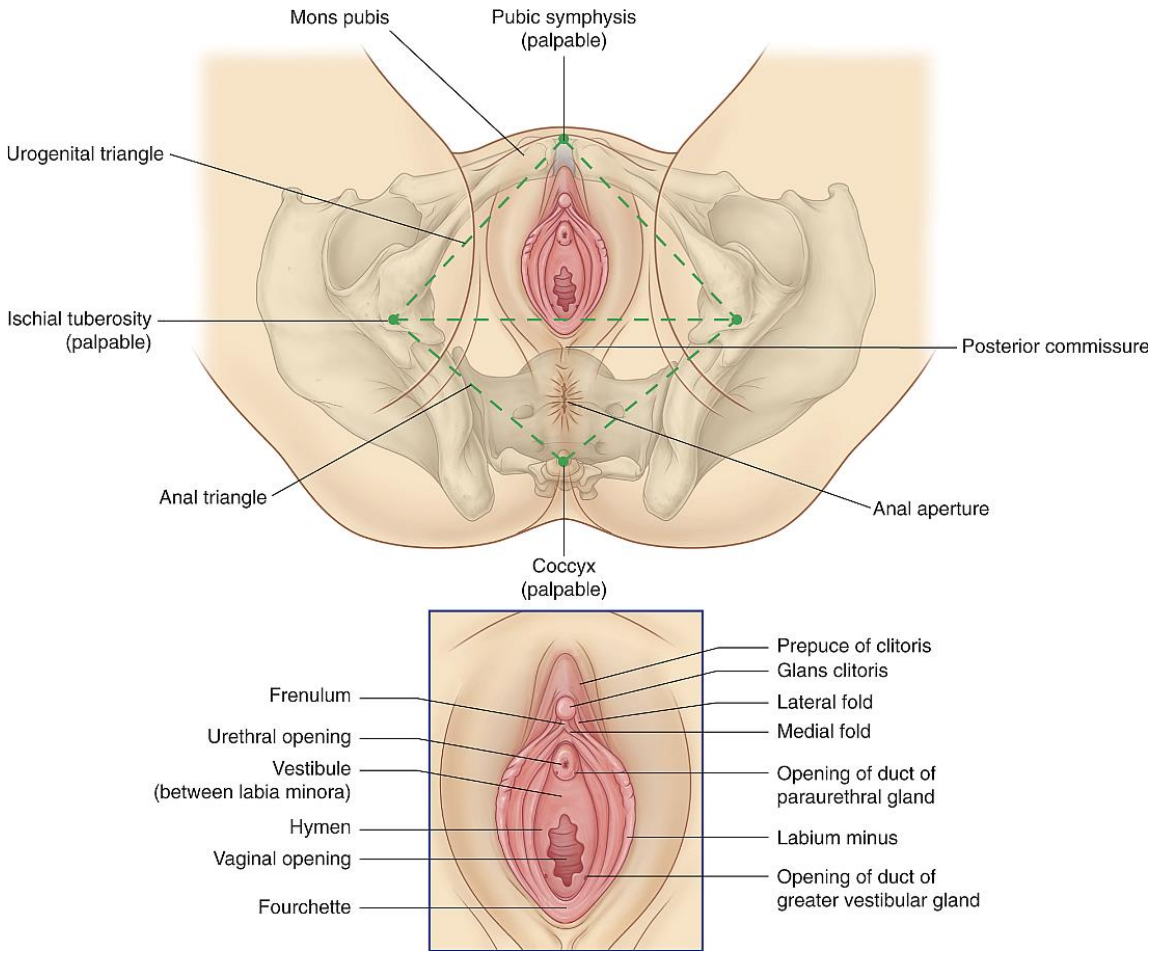
In women, the clitoris and vestibular apparatus, together with a number of skin and tissue folds, form the vulva. On either side of the midline are two thin folds of skin termed the labia minora. The region enclosed between them, and into which the urethra and vagina open, is the vestibule. Anteriorly, the labia minora each bifurcate, forming a medial and a lateral fold. The medial folds unite to form the frenulum of the clitoris, that joins the glans clitoris. The lateral folds unite ventrally over the glans clitoris and the body of the clitoris to form the prepuce of the clitoris (hood). The body of the clitoris extends anteriorly from the glans clitoris and is palpable deep to the prepuce and related skin. Posterior to the vestibule, the labia minora unite, forming a small transverse fold, the frenulum of the labia minora (the fourchette).

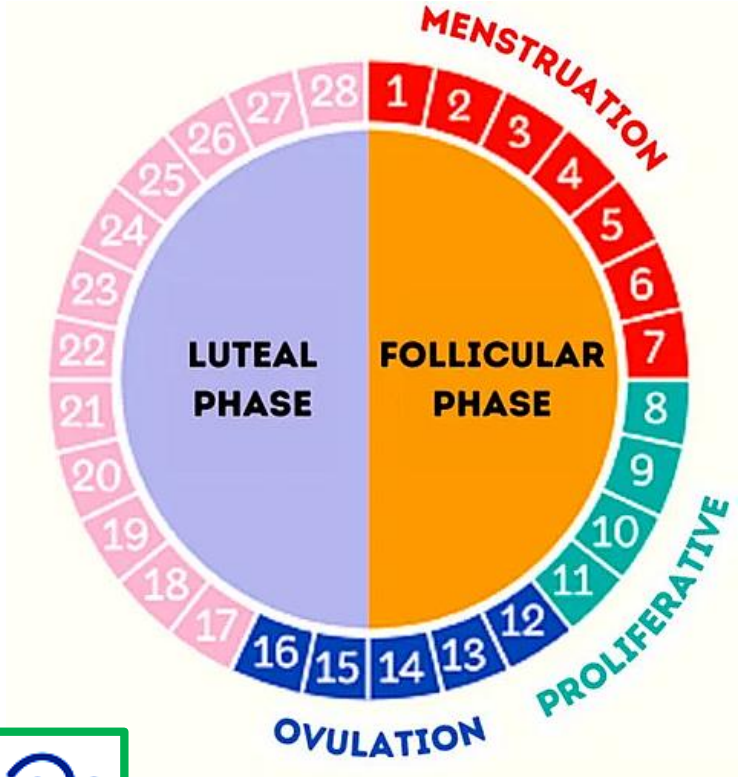


External genitals

Within the vestibule, the vaginal orifice is surrounded to varying degrees by a ring-like fold of membrane, the hymen, which may have a small central perforation or may completely close the vaginal opening. Following rupture of the hymen (resulting from first sexual intercourse or injury), irregular remnants (CARUNCULS) of the hymen fringe the vaginal opening.
The orifices of the urethra and the vagina are associated with the openings of glands. The ducts of the para-urethral glands (Skene's glands) open into the vestibule, one on each side of the lateral margin of the urethra. The ducts of the greater vestibular glands (Bartholin's glands) open adjacent to the posterolateral margin of the vaginal opening in the crease between the vaginal orifice and remnants of the hymen.

Lateral to the labia minora are two broad folds, the labia majora, which unite anteriorly to form the mons pubis. The mons pubis overlies the inferior aspect of the pubic symphysis and is anterior to the vestibule and the clitoris. Posteriorly, the labia majora do not unite and are separated by a depression termed the posterior commissure, which overlies the position of the perineal body.




MENSTRUATION
PROLIFERATIVE
OVULATION
LUTEAL PHASE
FOLLICULAR PHASE
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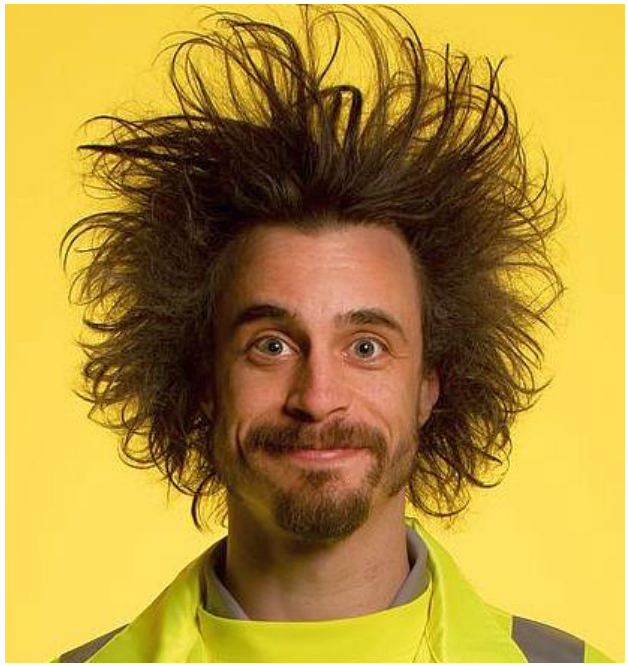

One more time?!
Try our video!