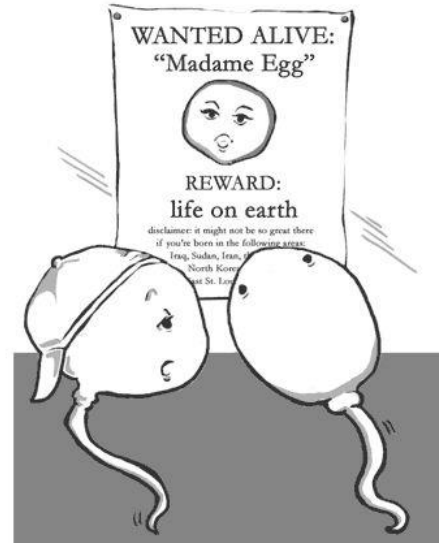


FEMALE GENITAL ORGANS

Organa genitalia feminina

General medicine, aVLANII0222p, spring 2017

copyright 2005 baby-gaga.com



There's a new one up every month now that they're TTC



Department of Anatomy
MU Brno, Czech Republic



ANATOMY 2

spring 2017

for more
see IS

recommended
literature
materials to
study

	Lectures	Seminars	Self-study
1.	Female genital system Female pelvic floor	Female genital system, Female pelvic floor Description of x-ray pictures	Female external genital organs The muscles of the external genitalia of women
2.	Heart, aortic arch	Heart, ascending aorta, aortic arch. A. carotis communis, a. carotis externa	Innervation and the lymph system of the heart
3.	Arteries, veins, lymph system (digest)	Descending aorta, main arteries and veins Portal vein, portocaval anastomoses, Fetal circulation	Branches of arteries. Tributaries of veins. Lymphatic system
4.	Spinal cord and brain stem (structure)	Gross anatomy of the CNS (spinal cord, brain stem). Appearance of the cranial nerves in the brainstem Cranial nerve nuclei on the floor of IV. ventricle	General anatomy of nerve system
5.	Cranial nerves (III.-VII., IX-XII)	Cranial nerves (III.-VII., IX-XII), course. Skull base	The main innervation regions of cranial nerves
6.	Cerebellum and diencephalon (structure, connections, functions) Hypothalamic-pituitary connections	Cranial nerve (V) Gross anatomy of the cerebellum and diencephalon	Axonal transport
7.	Telencephalon (structure) Basal ganglia (connections, functions)	Telencephalon (anatomy; grey matter – cortex + basal ganglia; white matter – pathways)	Basic cortical areas by Brodmann
8.	Blood supply, meninges and ventricles of the CNS, cerebrospinal fluid	Blood supply, meninges and ventricles of the CNS, cerebrospinal fluid	Circumventricular organs
9.	Auditory and vestibular system Cranial nerve VIII	Auditory and vestibular system Temporal bone	
10.	Visual system + orbital region	Visual system + orbital region	Cervical plexus, intercostal nerves
11.	Human body imaging techniques Organ projections	Imaging techniques, reading of anatomical structures	Skin and its derivatives
12.	ANS (cervical sympathetic system, enteric system, central modulation of the ANS)	Preparations for the dissection: head, neck and trunk regions	ANS (division, characteristics, basic structural arrangements)
13. 14.		Dissection (dissection of the head, neck and trunk)	

FEMALE GENITAL ORGANS

Internal female genitals:

ovarium

tuba uterina

uterus

vagina

External genitals:

labia majora pudendi

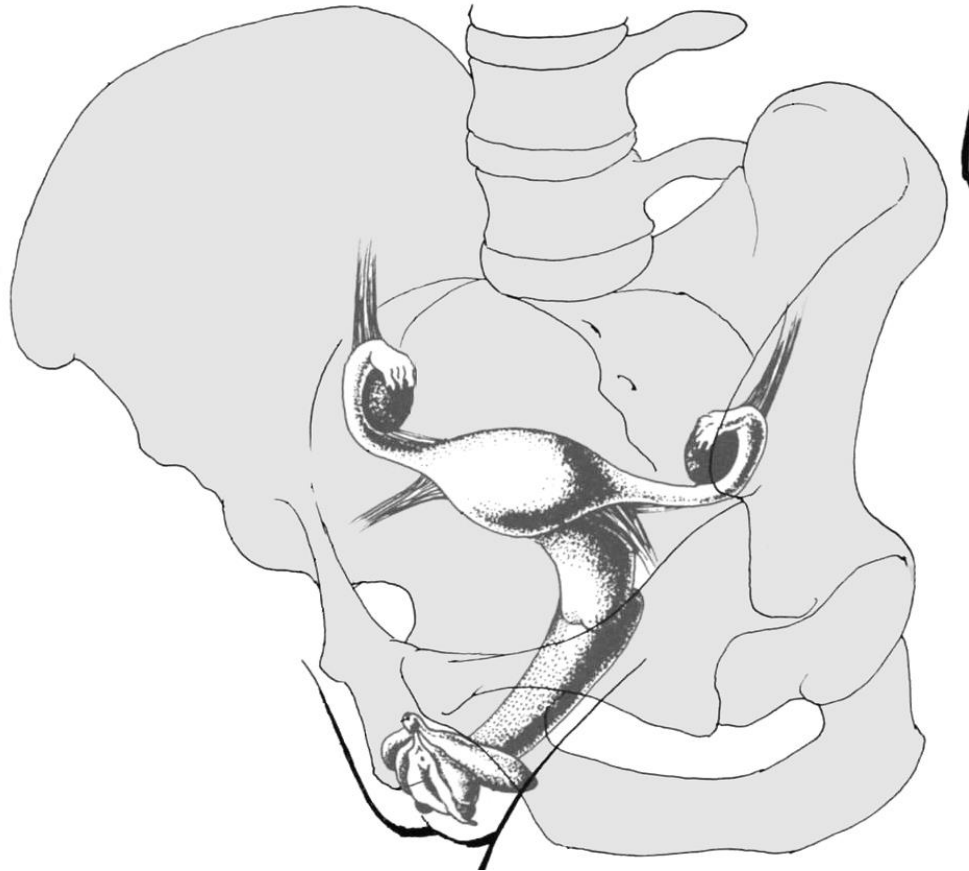
labia minora pudendi

clitoris

vestibulum vaginae

bulbi vestibuli

gl. vestib. maj. et min.



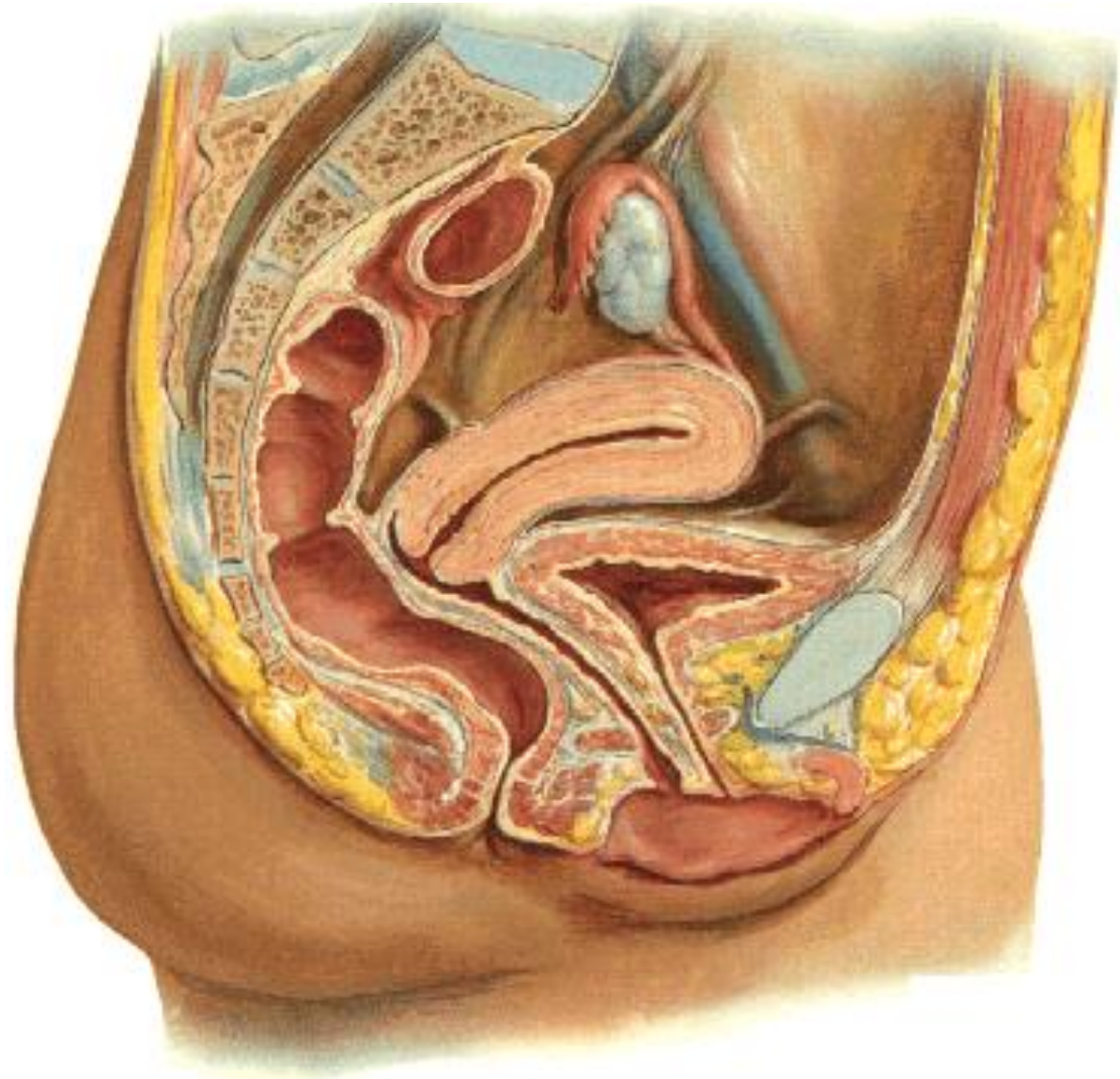
Internal female genital organs

Ovary (ovarium)

Fallopian tube (*tuba uterina*)

Uterus

Vagina

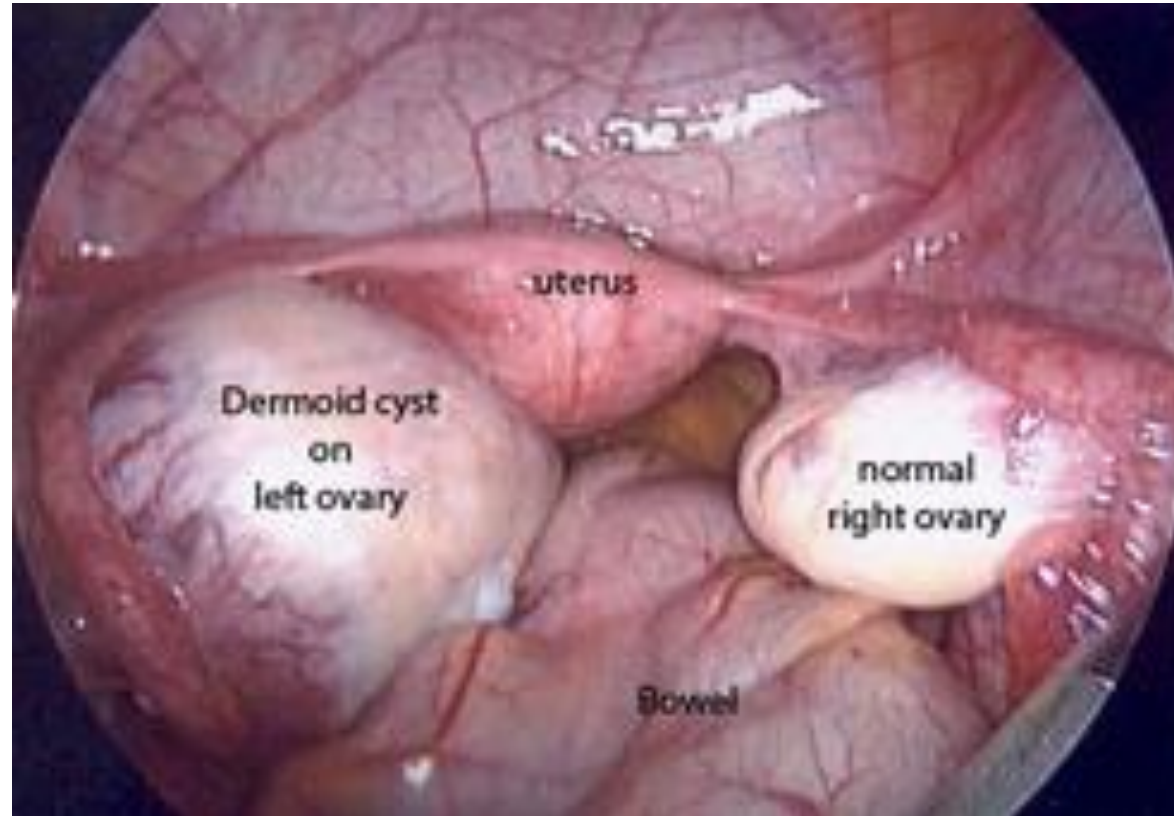


Ovarium

Produces germ cells

Endocrine function

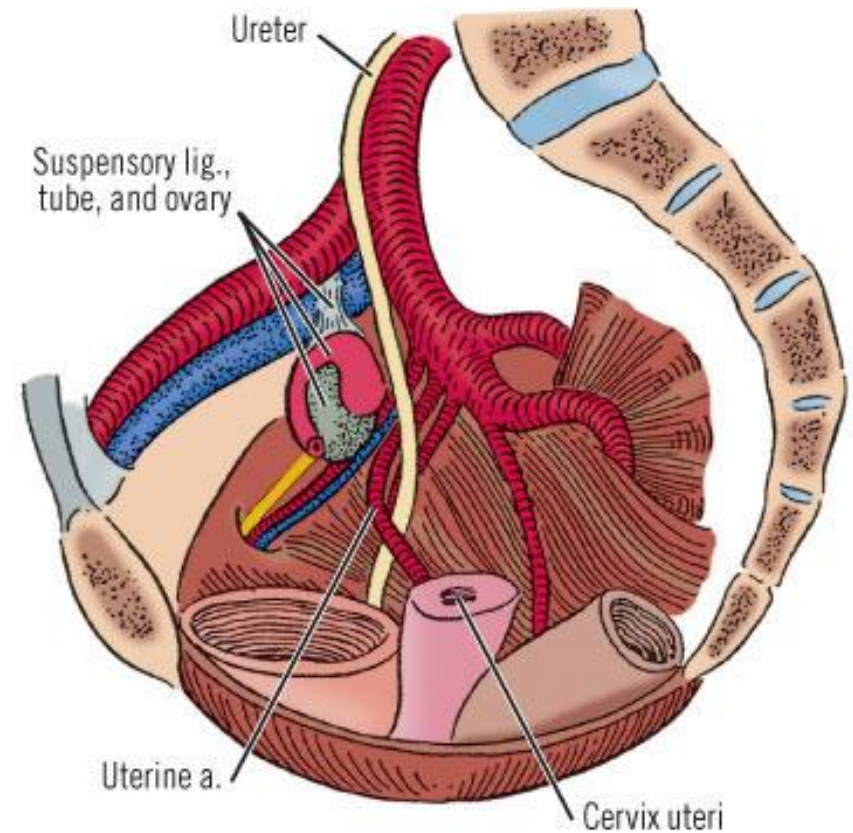
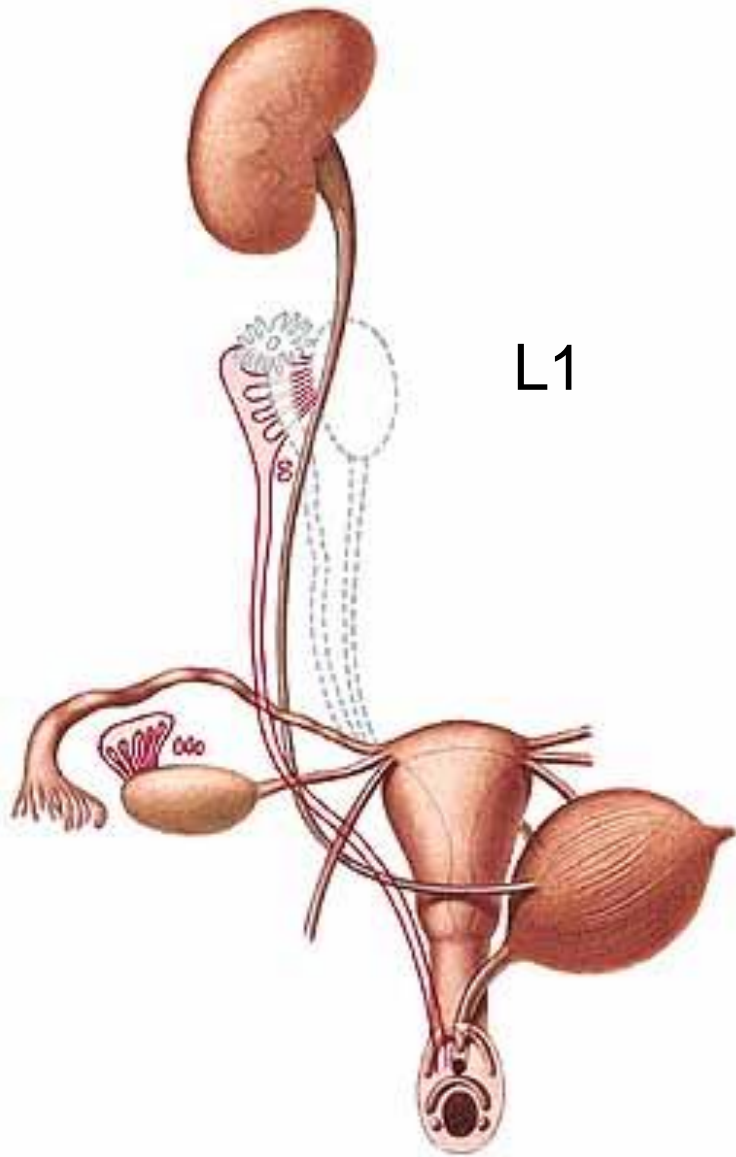
6-10g, 3-5cm



depends on functional state

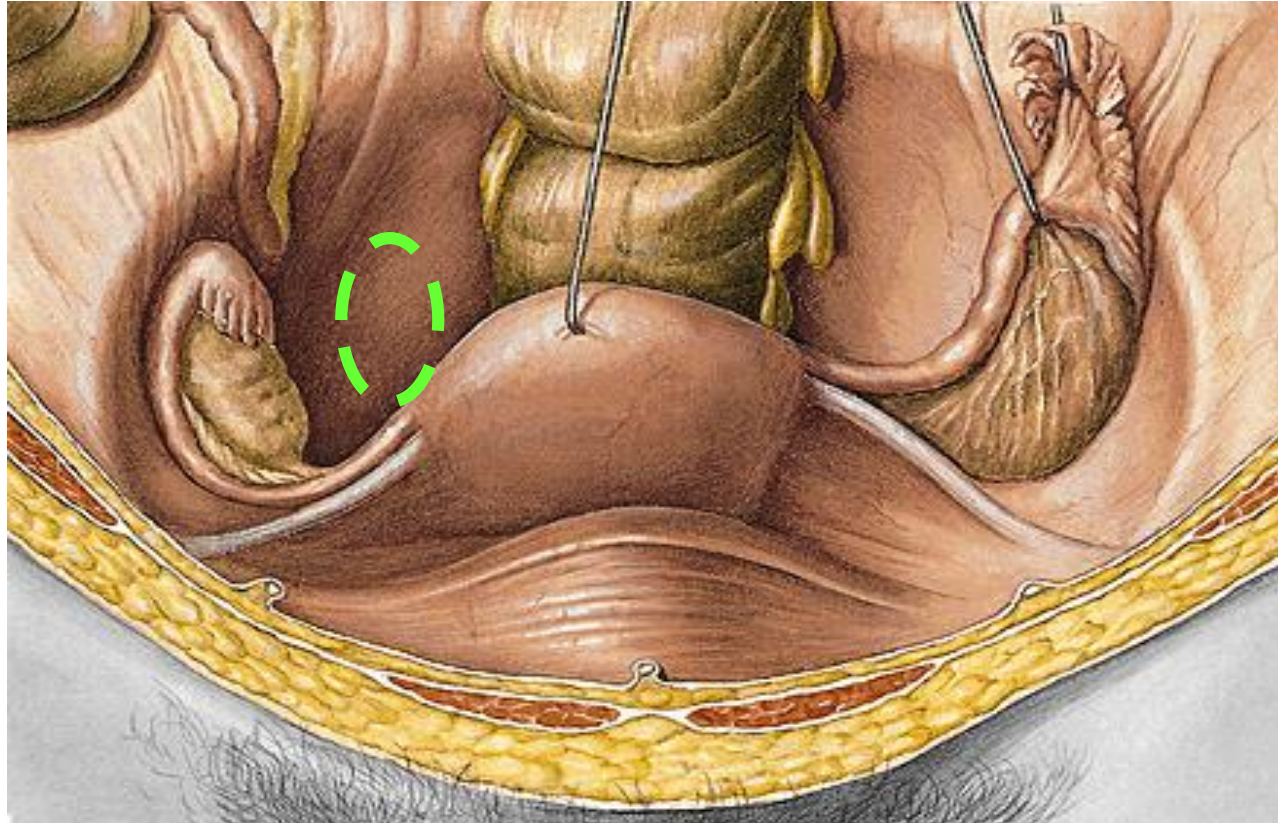
Descend of the ovaries

At the beginning: **abdominal cavity**-
end of i.u. development: **fossa iliaca**
- 1. year: **fossa ovarica**
- after giving a birth: **Claudius pit**



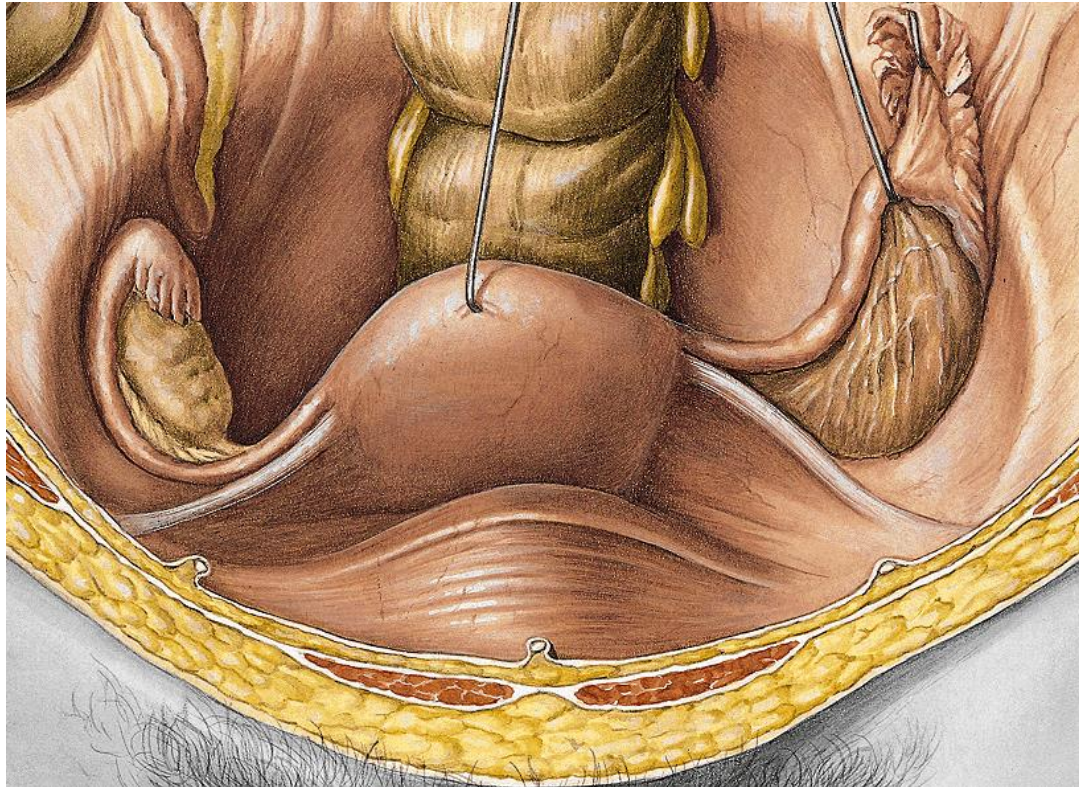
LOCALIZATION OF OVARY

Female gonads, paired, lie in shallow depressions, one on each side of the upper pelvic cavity



Nullipara – fossa ovarica (in front of a. iliaca int.)

Multipara – Claudius fossa (behind a. iliaca int.)



**Axis passes
longitudinally!**

Extremitas

**tubaria (upper)
uterina (lower)**

Facies: med., lat.

Margo

liber (post)

**mesovaricus (ant,
hilus)**

Ovarian cycle

Lig. suspensorium ovarii (vasa ovarica)

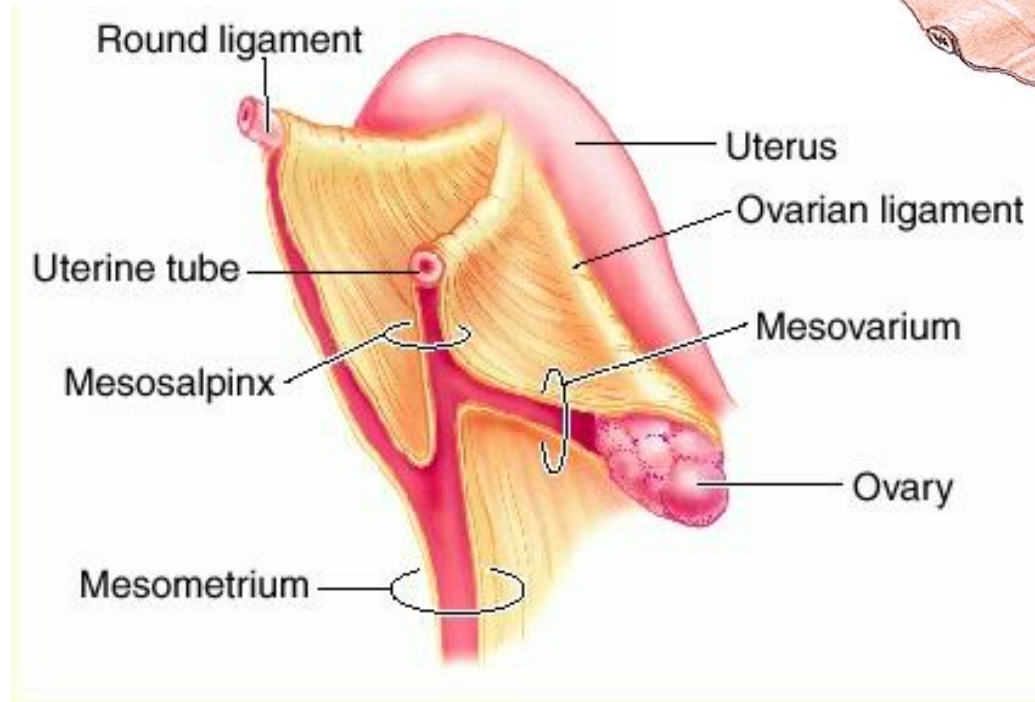
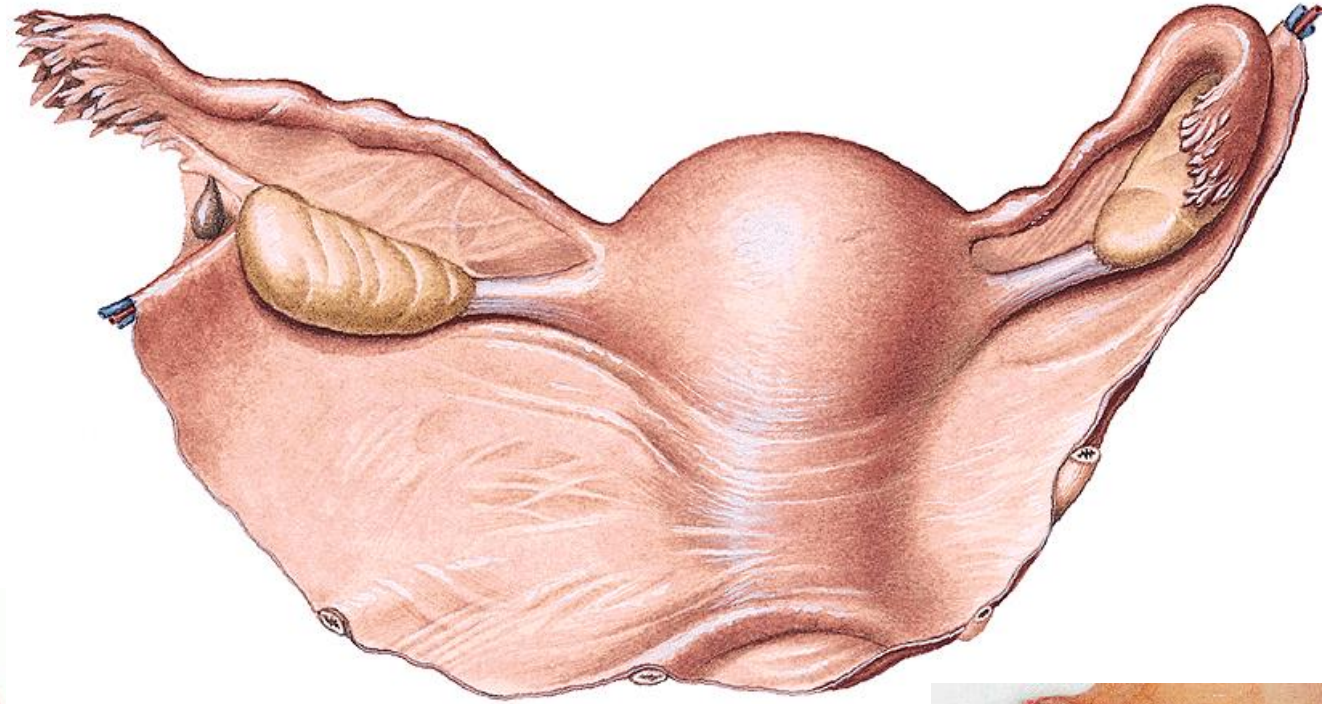
HANGING APPARATUS

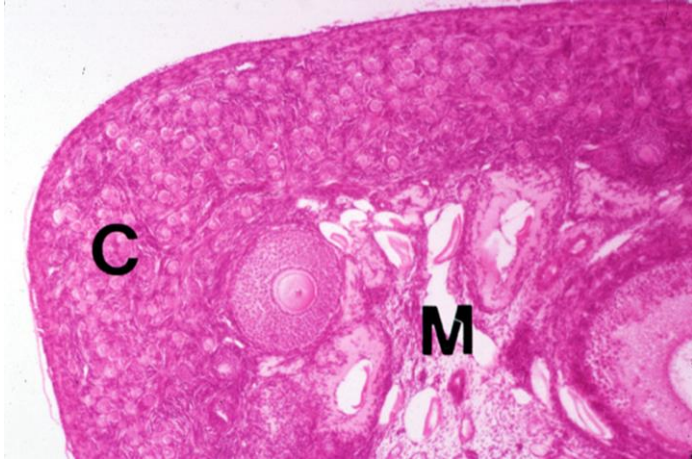
Lig. ovarii proprium

Hilus ovarii

Mesovarium

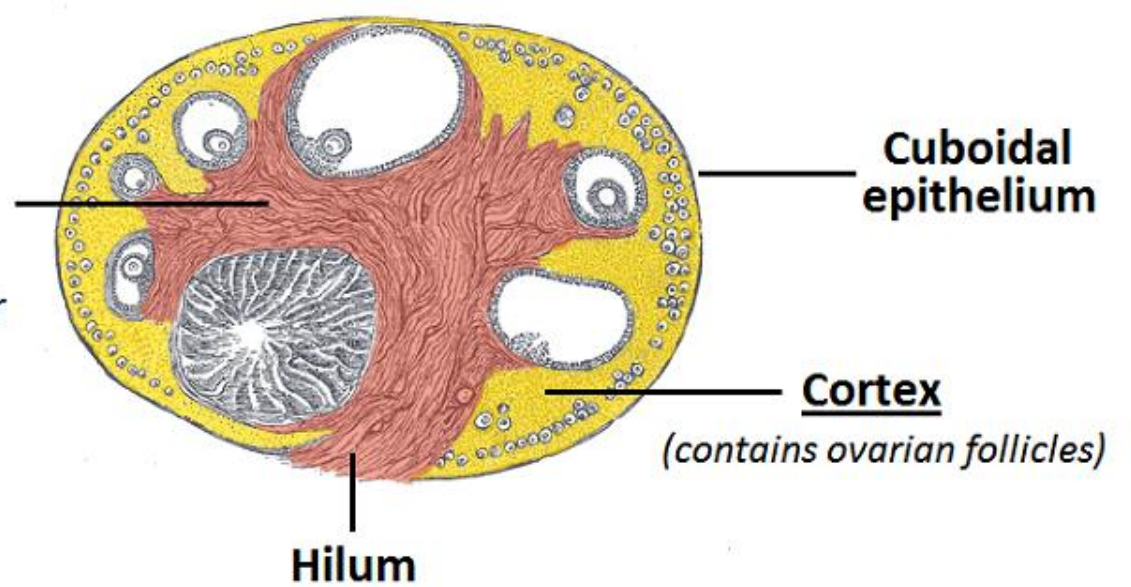
Lig. latum uteri





Ovary - cortex with follicle, medulla

Medulla
(contains neurovascular structures)



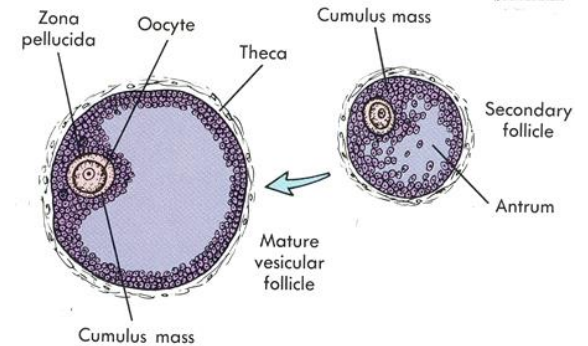
Tunica albuginea
Cortex ovarii:

Folliculi ovarici - primarii

- secundarii

- vesiculosi (Graaf)

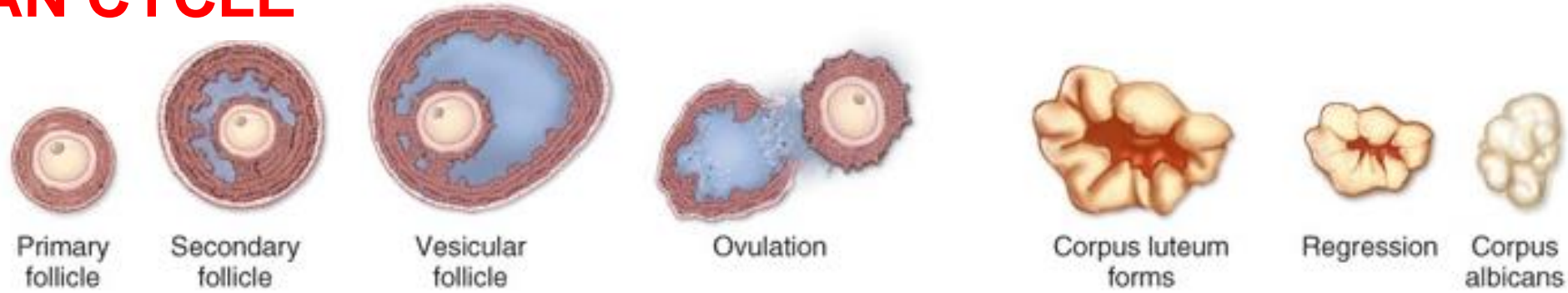
matured oocyt



Medulla ovarii

conn. tissue, blood and lymph vessels, nerves, smooth muscle

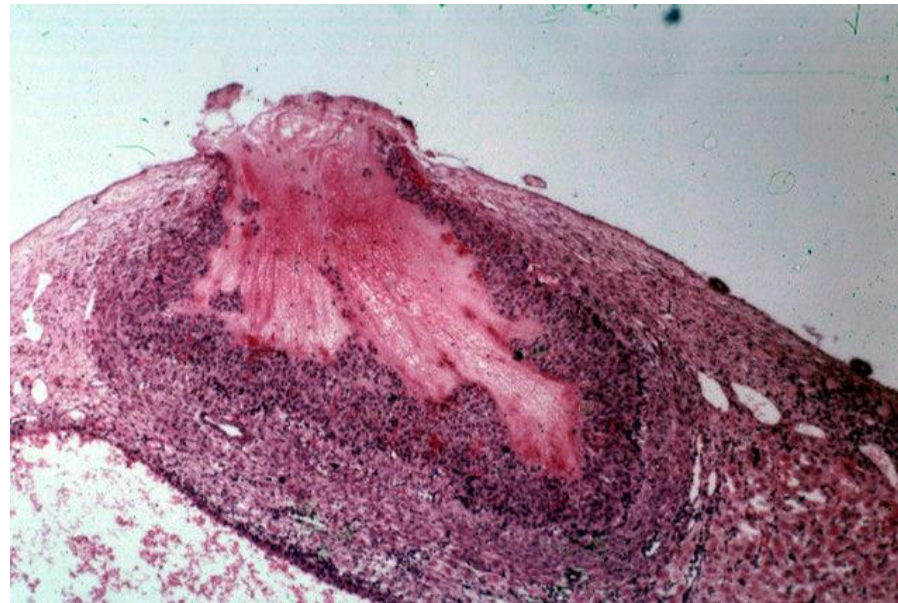
OVARIAN CYCLE



**Follicular stage
(Estrogen)**

Ovulation

Luteal stage (progesterone)



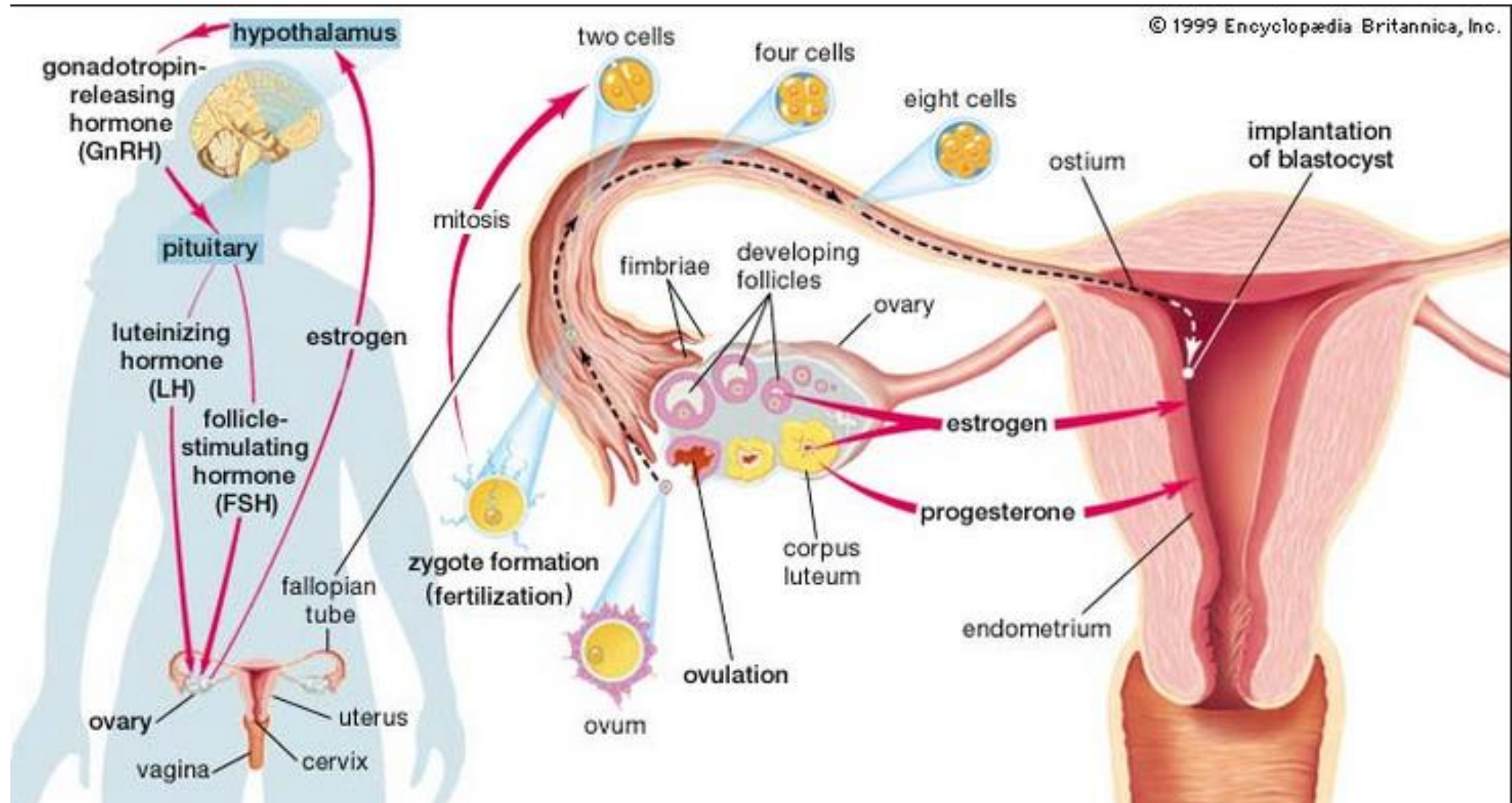
**c. l. graviditatis
c. l. menstruat. > corpus
albicans**

**At birth 2 million follicles
Puberty 300,000-400,000
Only 400 ever mature –
one egg/month through reproductive years (from
puberty (menarche) (12-13) until menopause (45-55))**

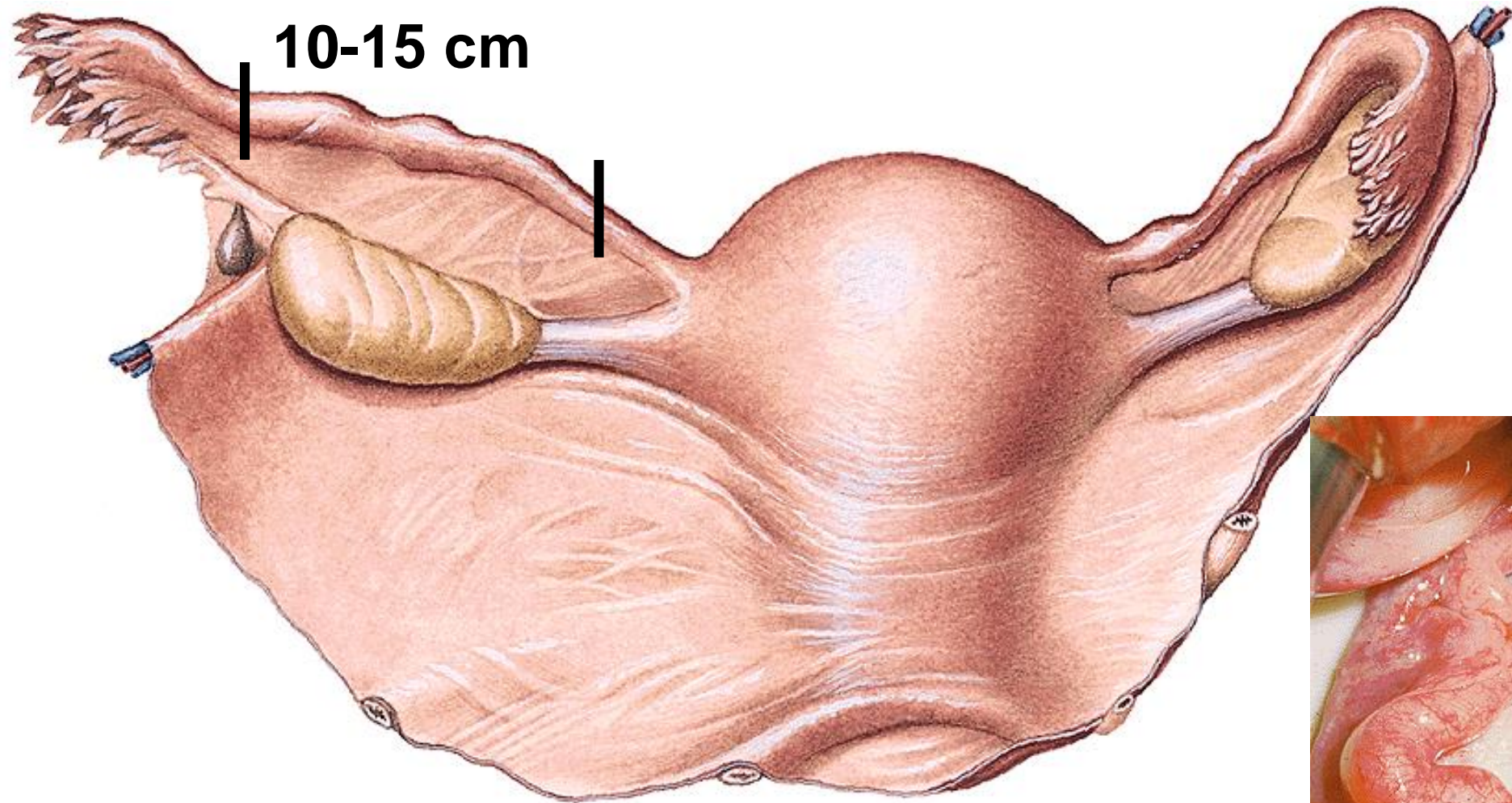
Hypophysis a) FSH b) LH = gonadotropin hormones

Ovarian cycle

- Hormones levels cycle in the female on a monthly basis
- Ovarian cycle drives the uterine cycle



Tuba uterina (salpinx)



**Ostium abdominale - infundibulum (fimbriae) -
ampulla - isthmus - pars uterina - ostium
uterinum**



PHALOPIAN TUBE COURSE

Isthmus – transversally (laterally) to the wall of pelvis minor

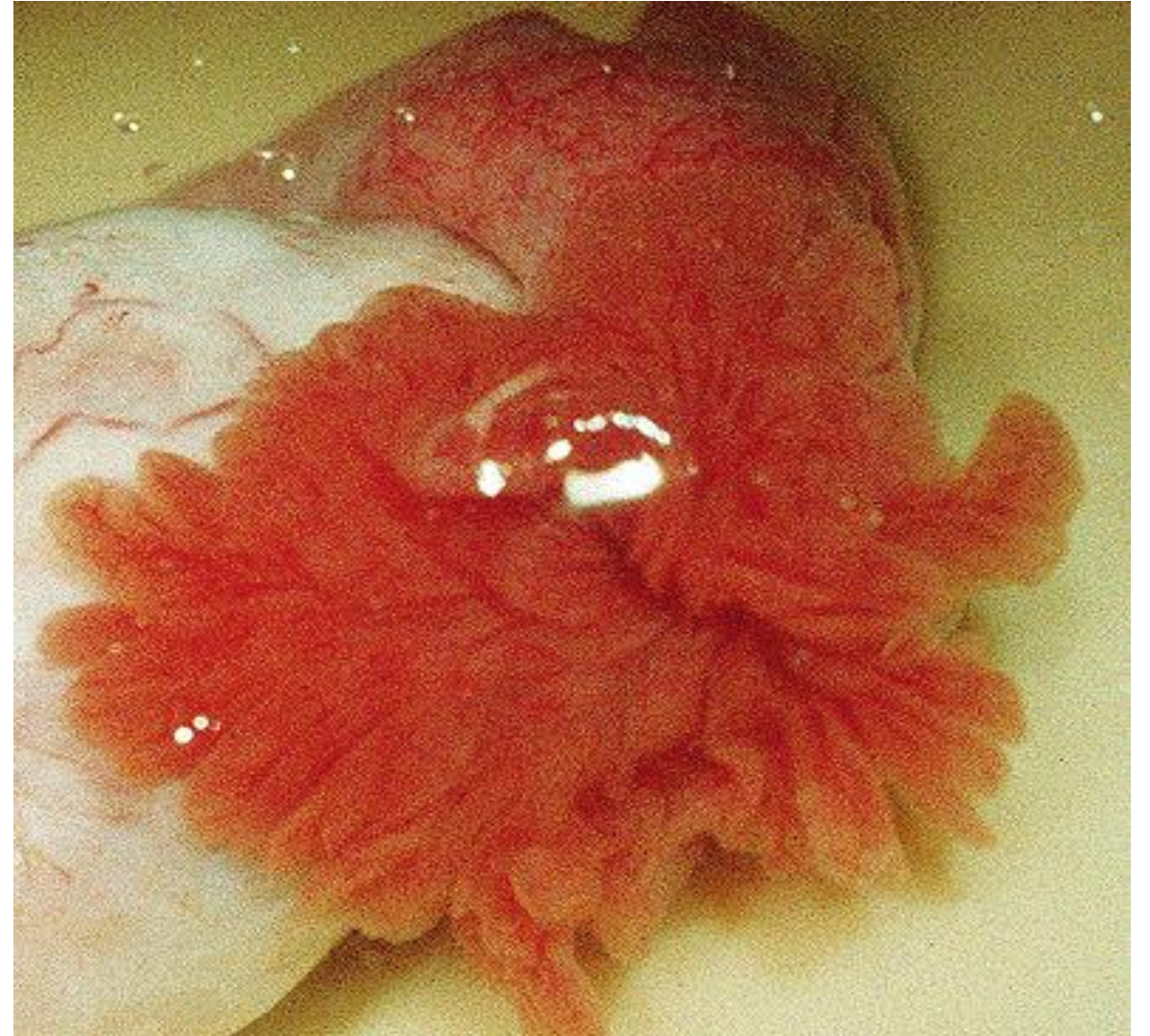
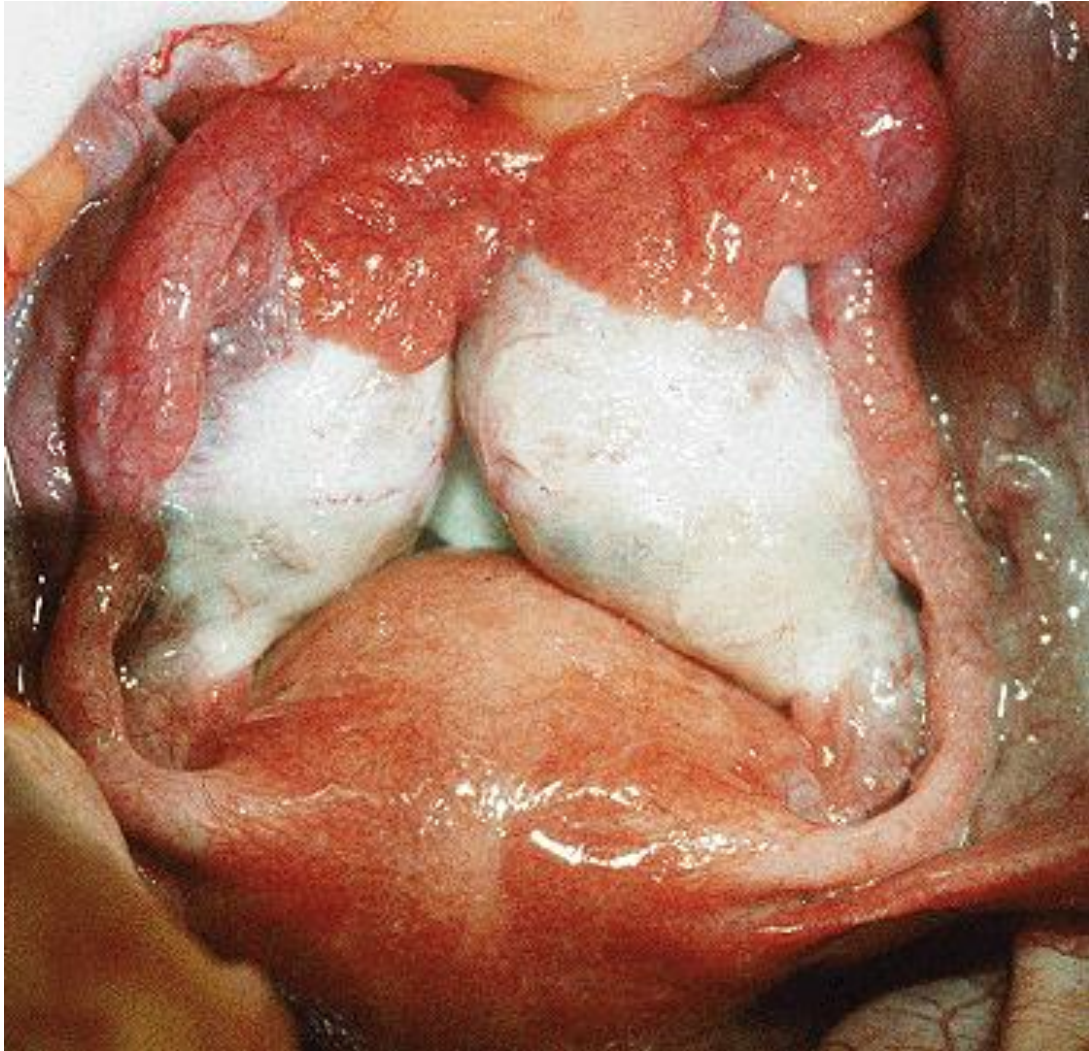
Ampulla - dorsocranially to the upper pole of ovary

Infundibulum - dorsocaudally

Fimbriae - rotated to fac. medialis et superior ovarii

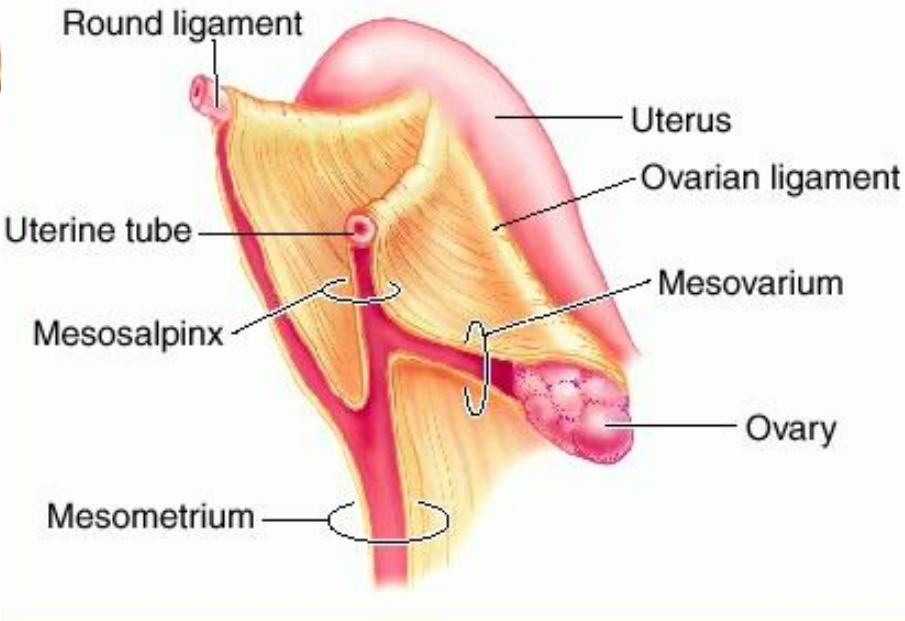
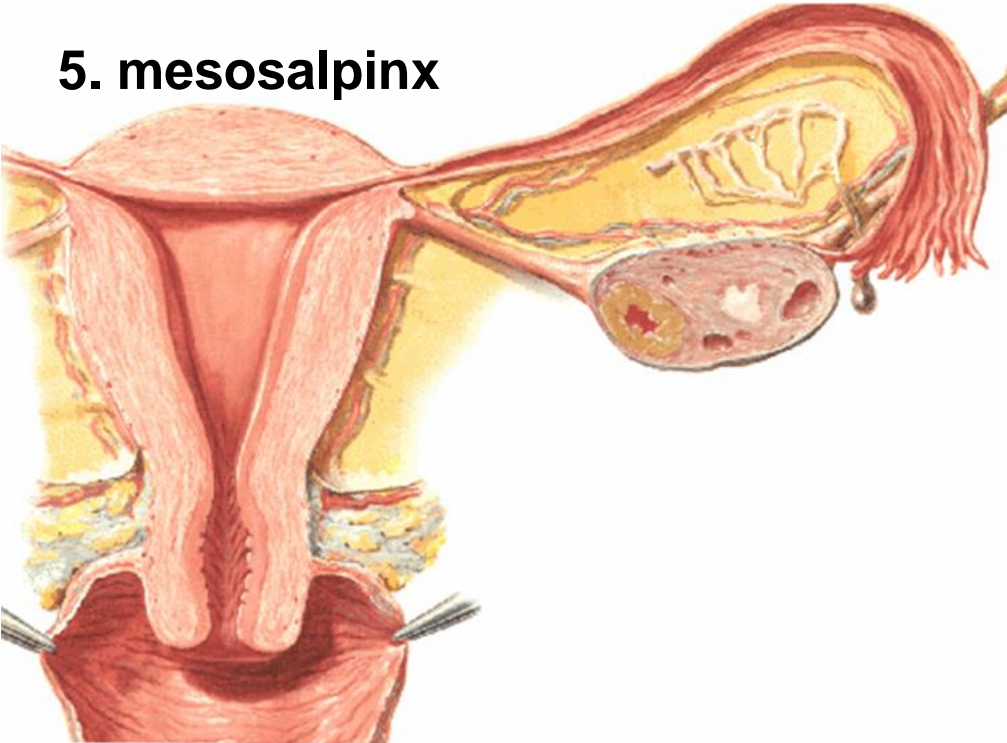
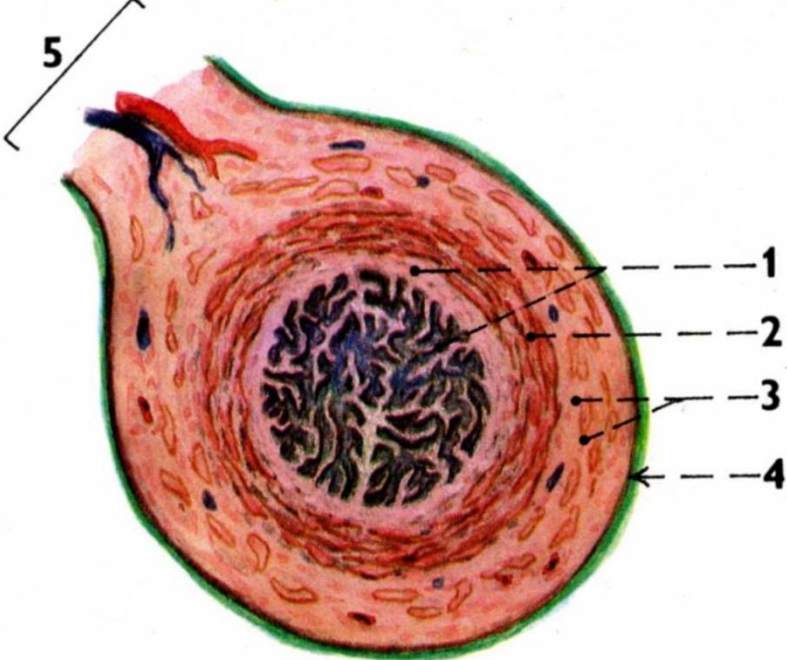


OSTIUM ABDOMINALE TUBAE UTERINAE



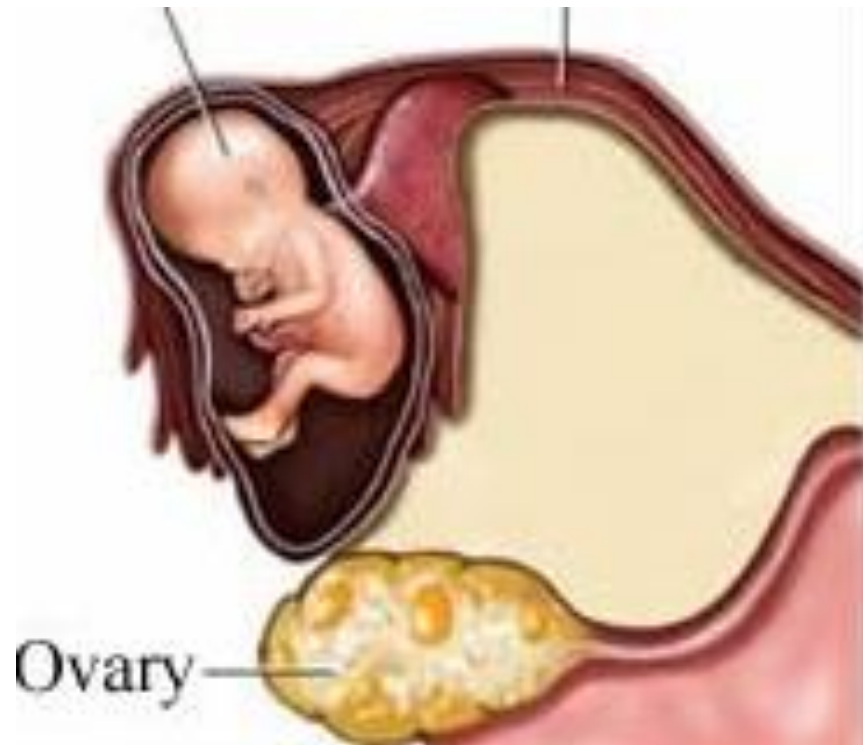
HISTOLOGY OF PHALOPIAN TUBE

- 1. Mucosal folds
(cylind. epithelium cilliated)
- 2. Circular muscular layer
- 3. Longitudinal muscular layer
- 4. tunica serosa
- 5. mesosalpinx

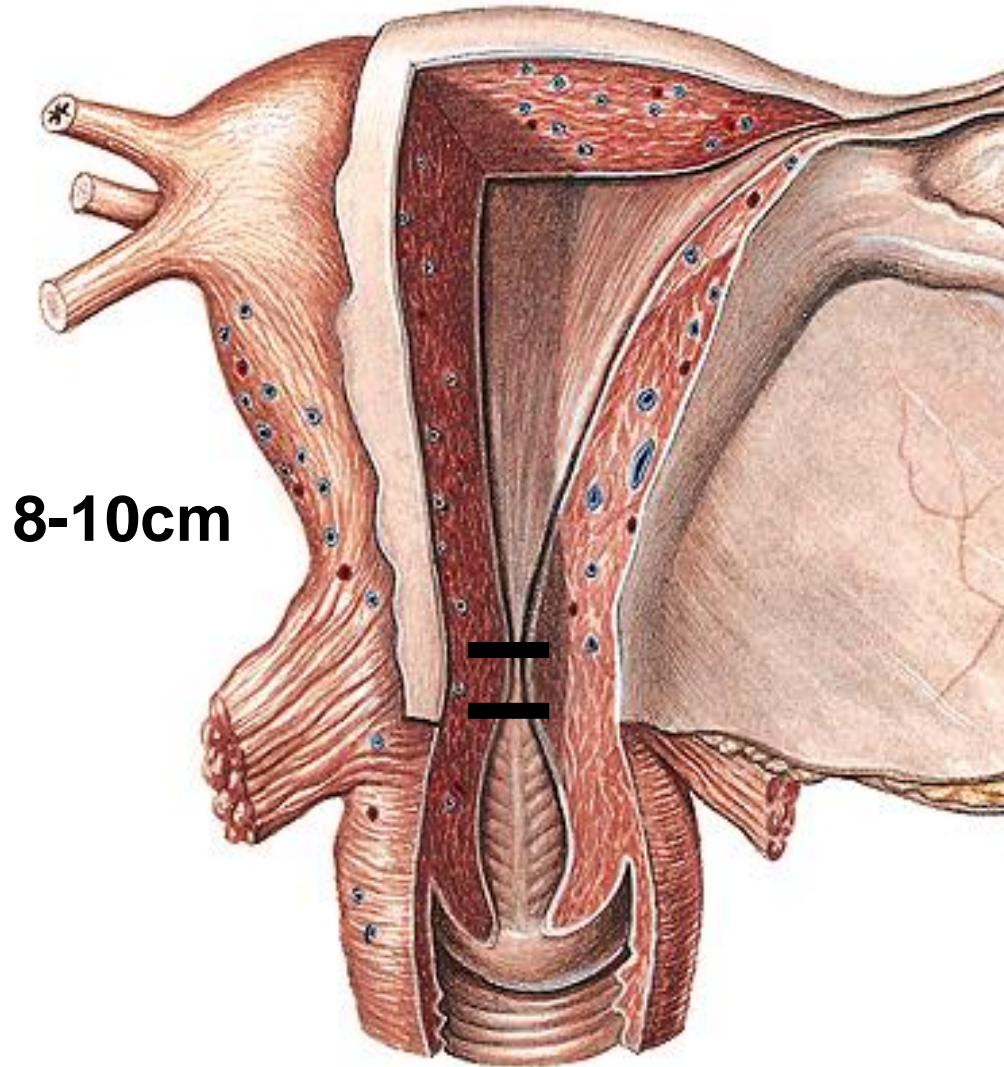


CLINIC NOTE

Changes of the mucosa (inflammations!) could causes that the tube is not passable for the egg => extrauterine pregnancy (Ectopic tubal pregnancy)!!!!



Uterus, hystera



Corpus

- fundus
- cornua – dex. et. sin.:
lig. ovarii propr. , lig. teres uteri
- margines- dx., sin.: lig. latum,
- facies intestinalis
vesicalis

Isthmus (1 cm)

- ## Cervix
- portio supravaginalis
 - vaginalis (cervix)

Cavum uteri (3 ml)

Canalis isthmi

Ostium internum canalis cervicis

Canalis cervicis (plicae palmatae)

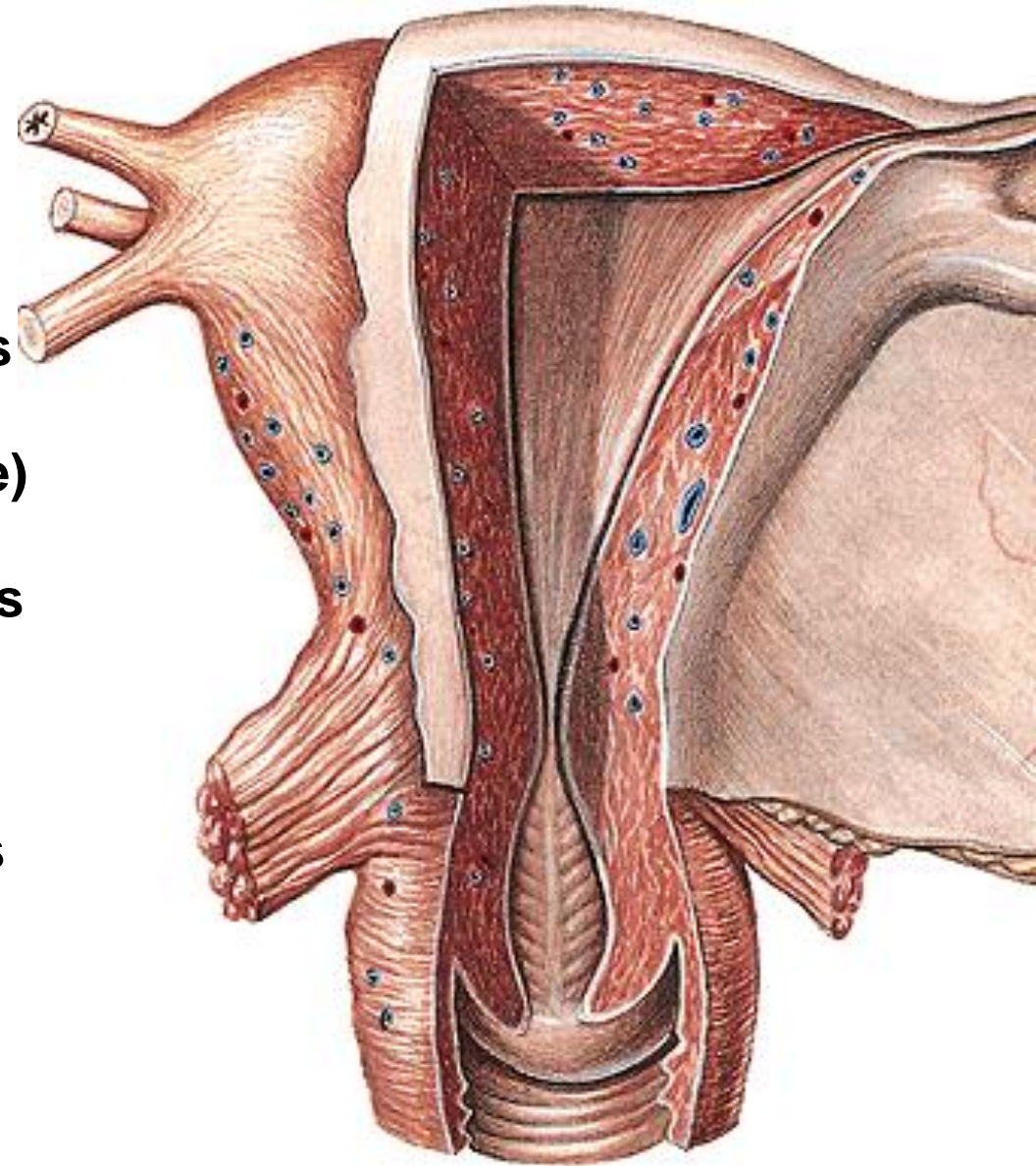
**Ostium externum canalis cervicis
(= ostium uteri)**

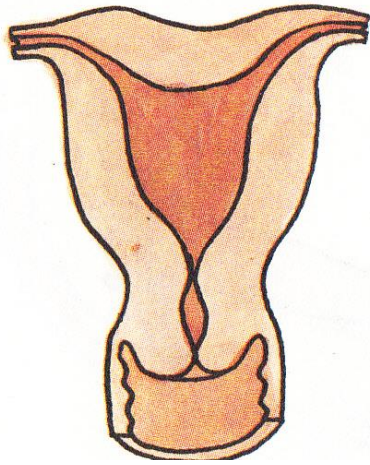
Cervix

portio supravaginalis

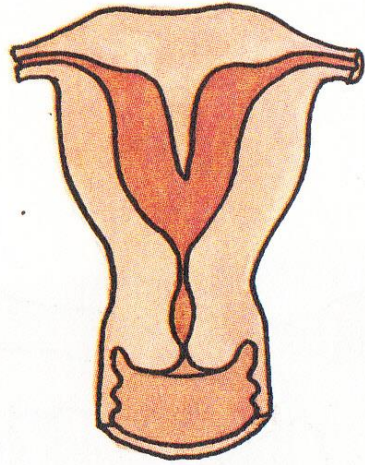
portio vaginalis

Fornix vaginae

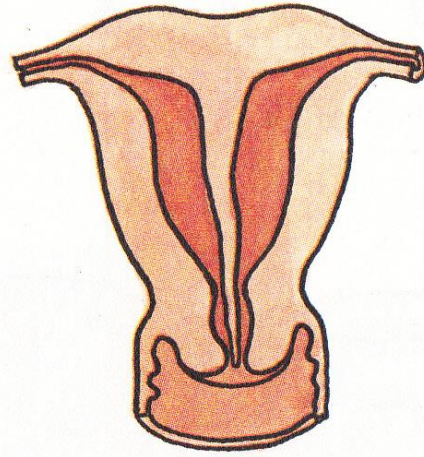




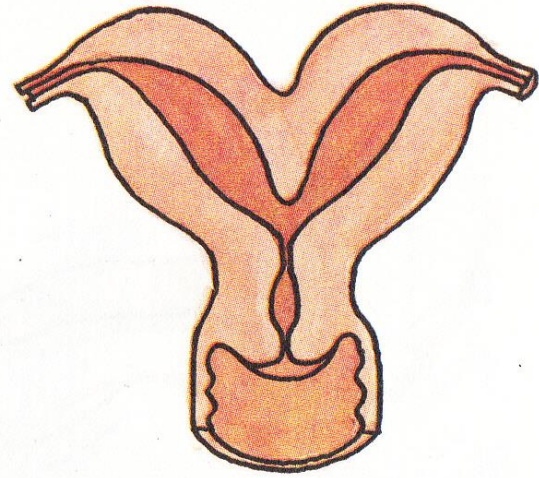
uterus arcuatus



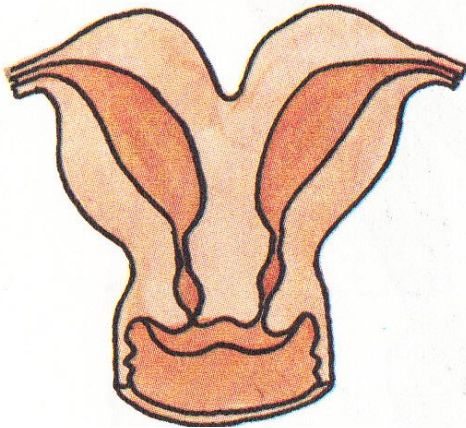
uterus subseptus



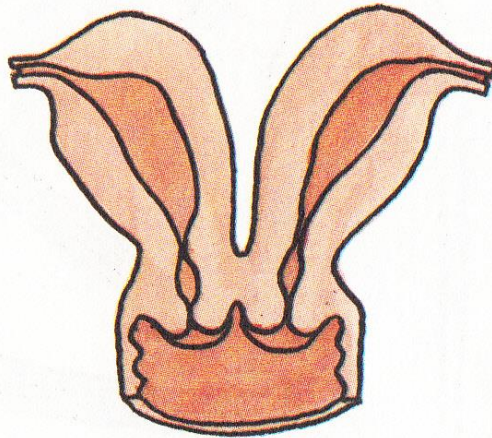
uterus septus



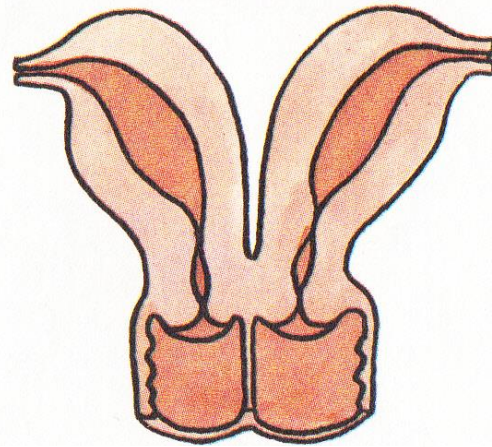
uterus bipartitus



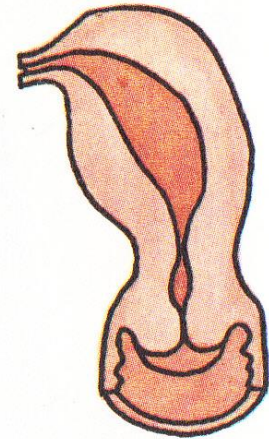
uterus duplex



uterus duplex



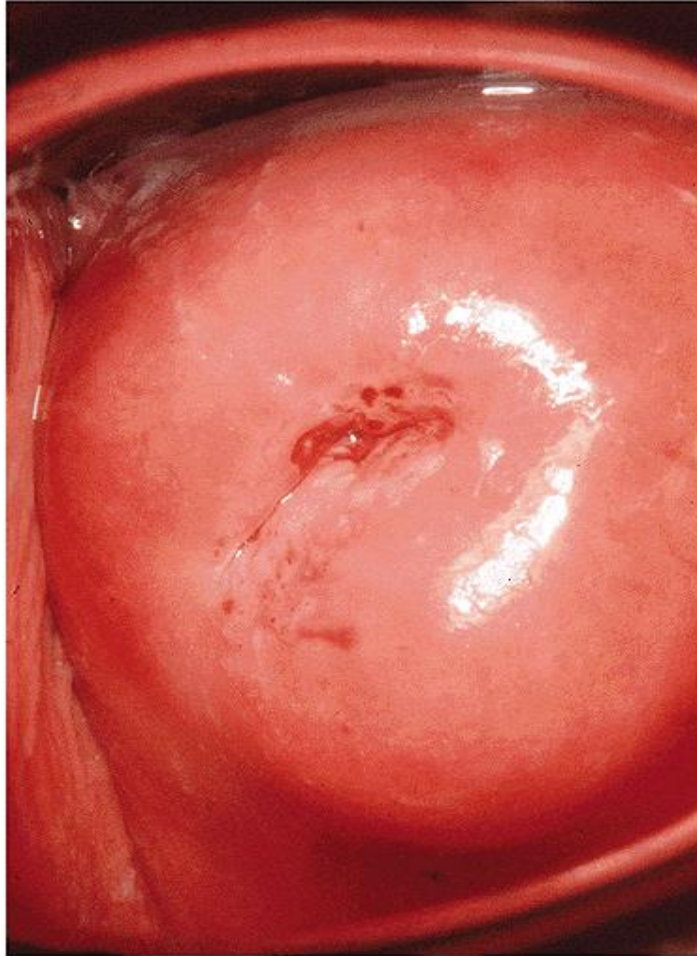
**uterus duplex
cum vagina septa**



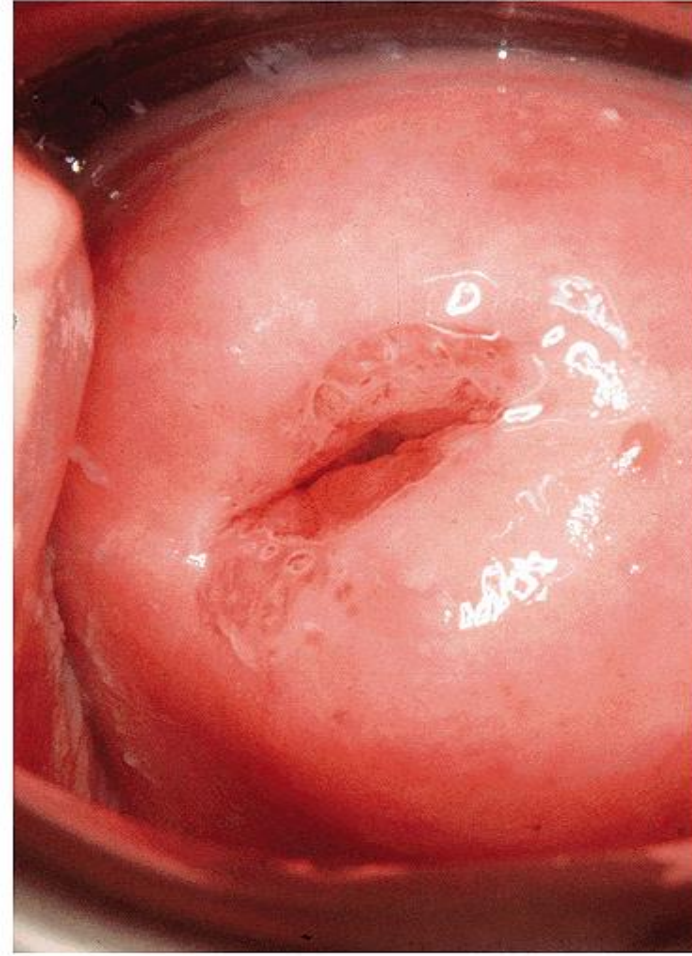
uterus unicornis

OSTIUM UTERI (OSTIUM EXTERNUM CANALIS CERVICIS)

NULLIPARA



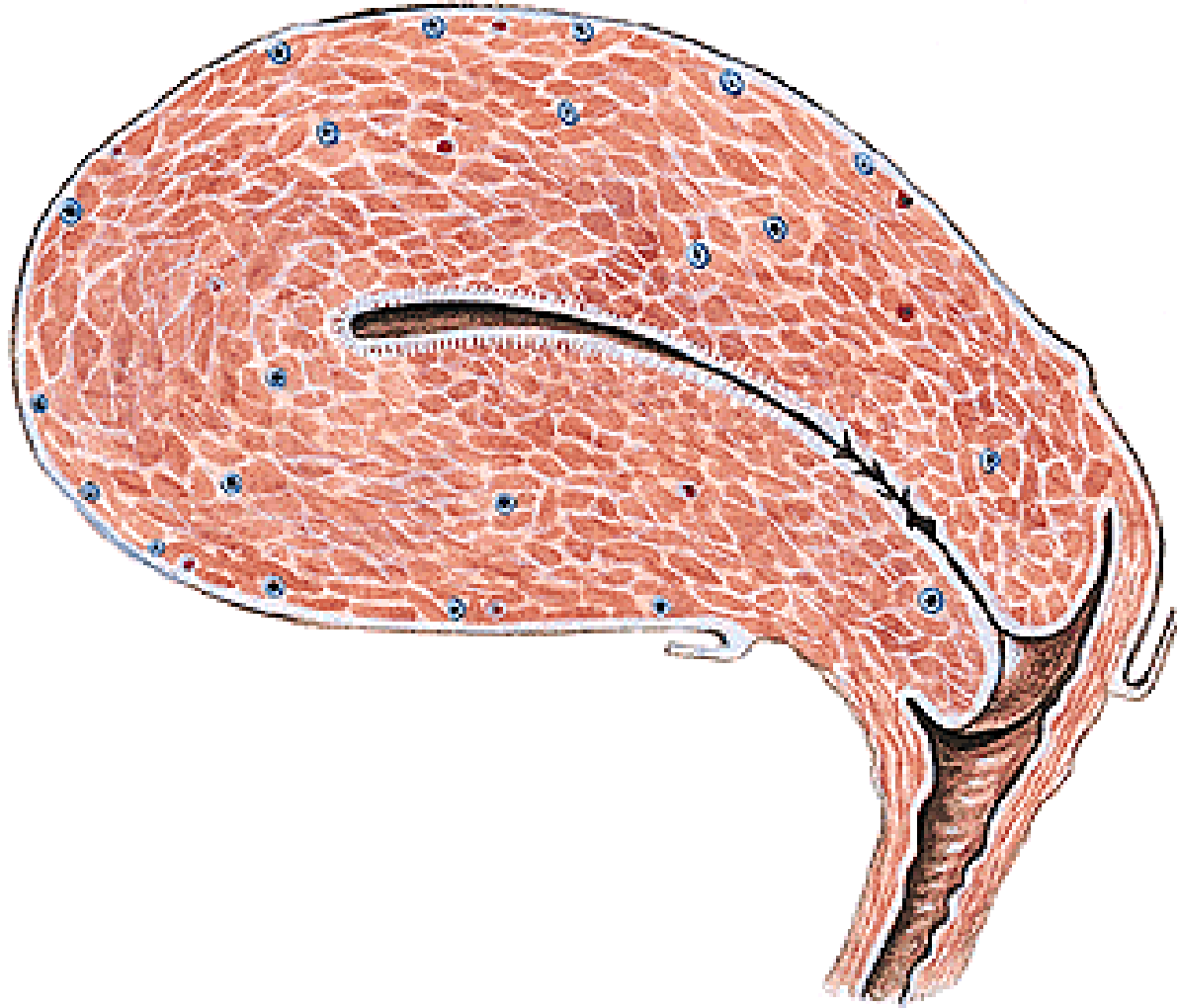
MULTIPARA



Labium anterius et posterius

Epithel of the vagina x epithel of the uterus!!!

HISTOLOGY OF UTERUS



Endometrium

Myometrium

Perimetrium

ENDOMETRIUM

Simple cylindric epithelium

zona basalis

zona functionalis

glandulae uterinae

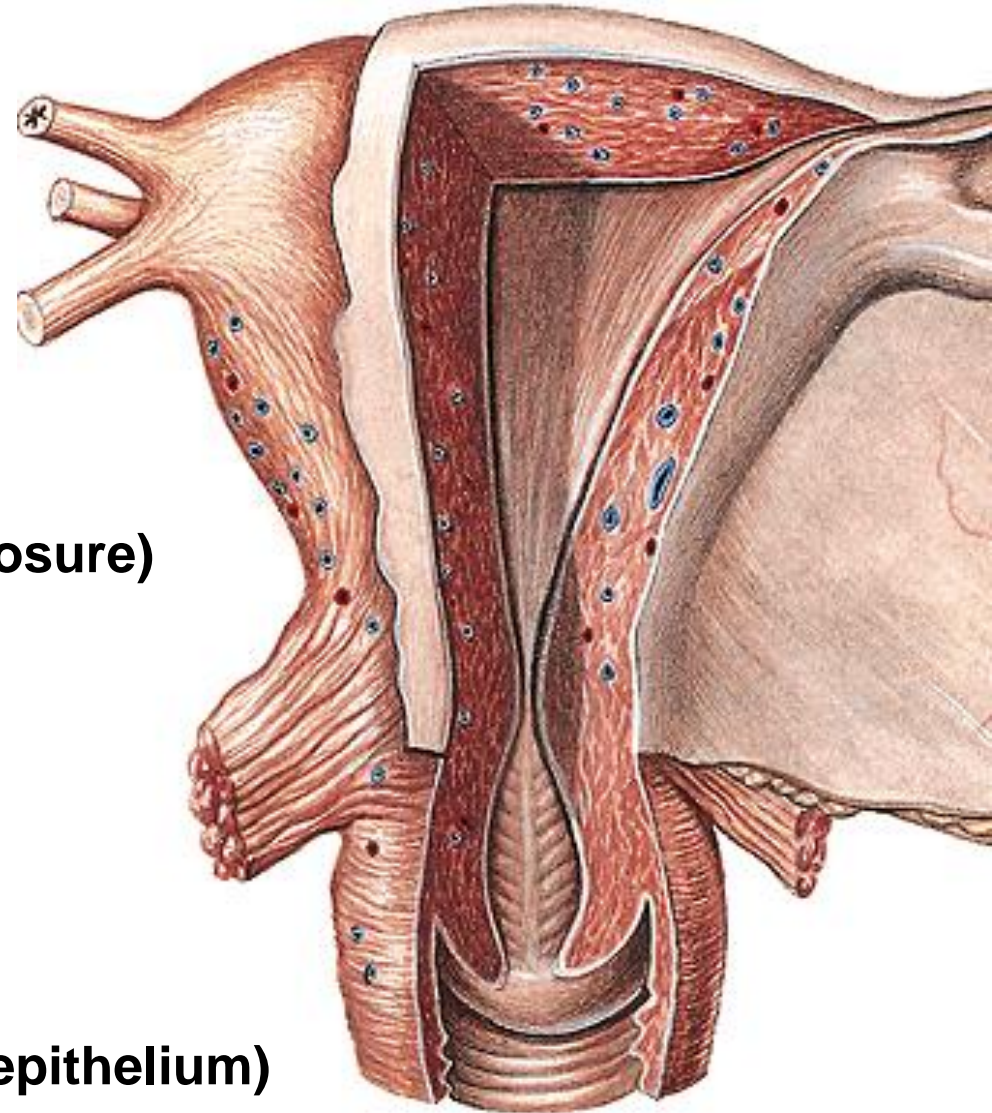
glandulae cervicales (mucose closure)

menstruation cycle

menarche

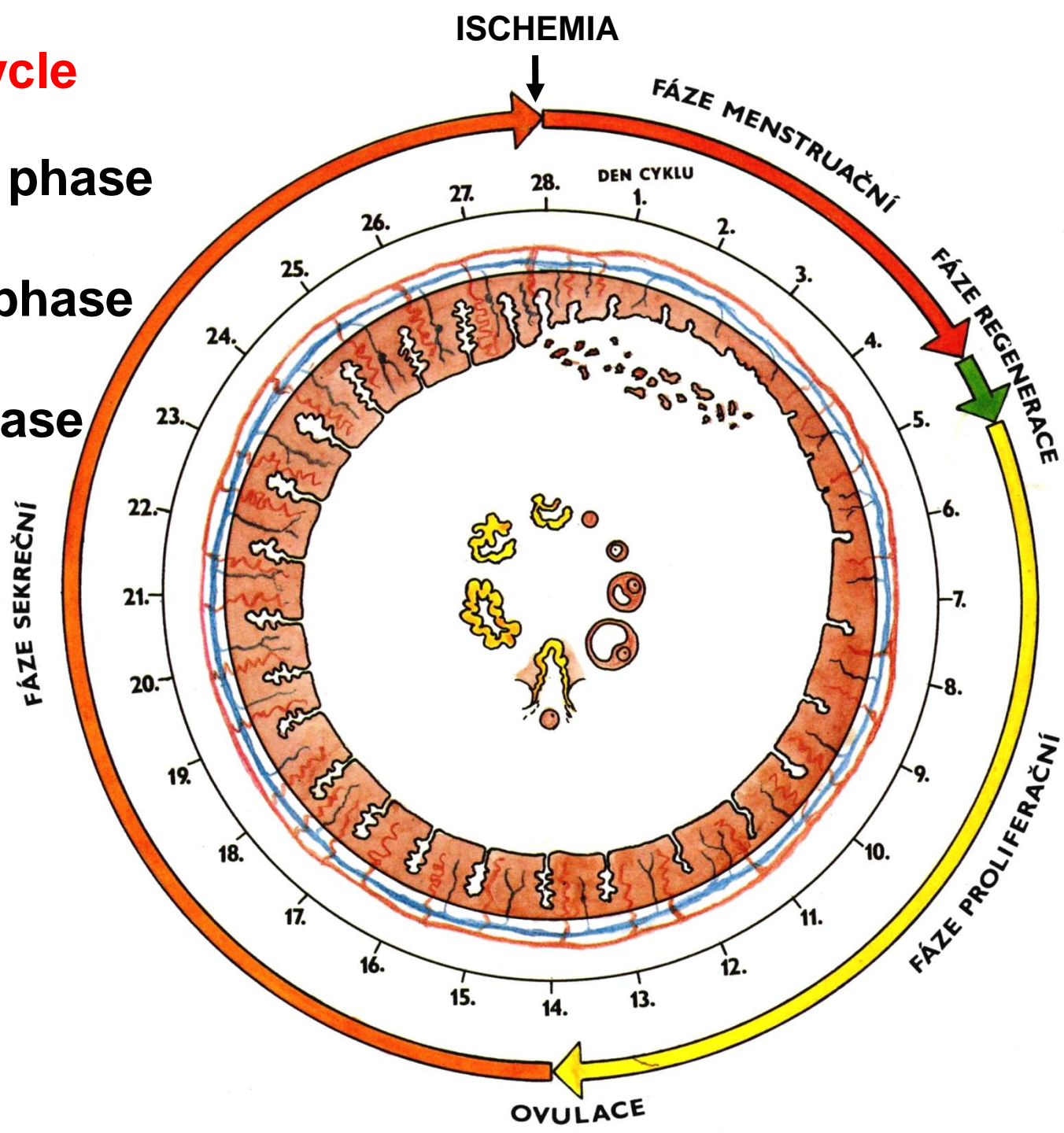
menopausa (climacterium)

ostium uteri (multilayer stratified epithelium)

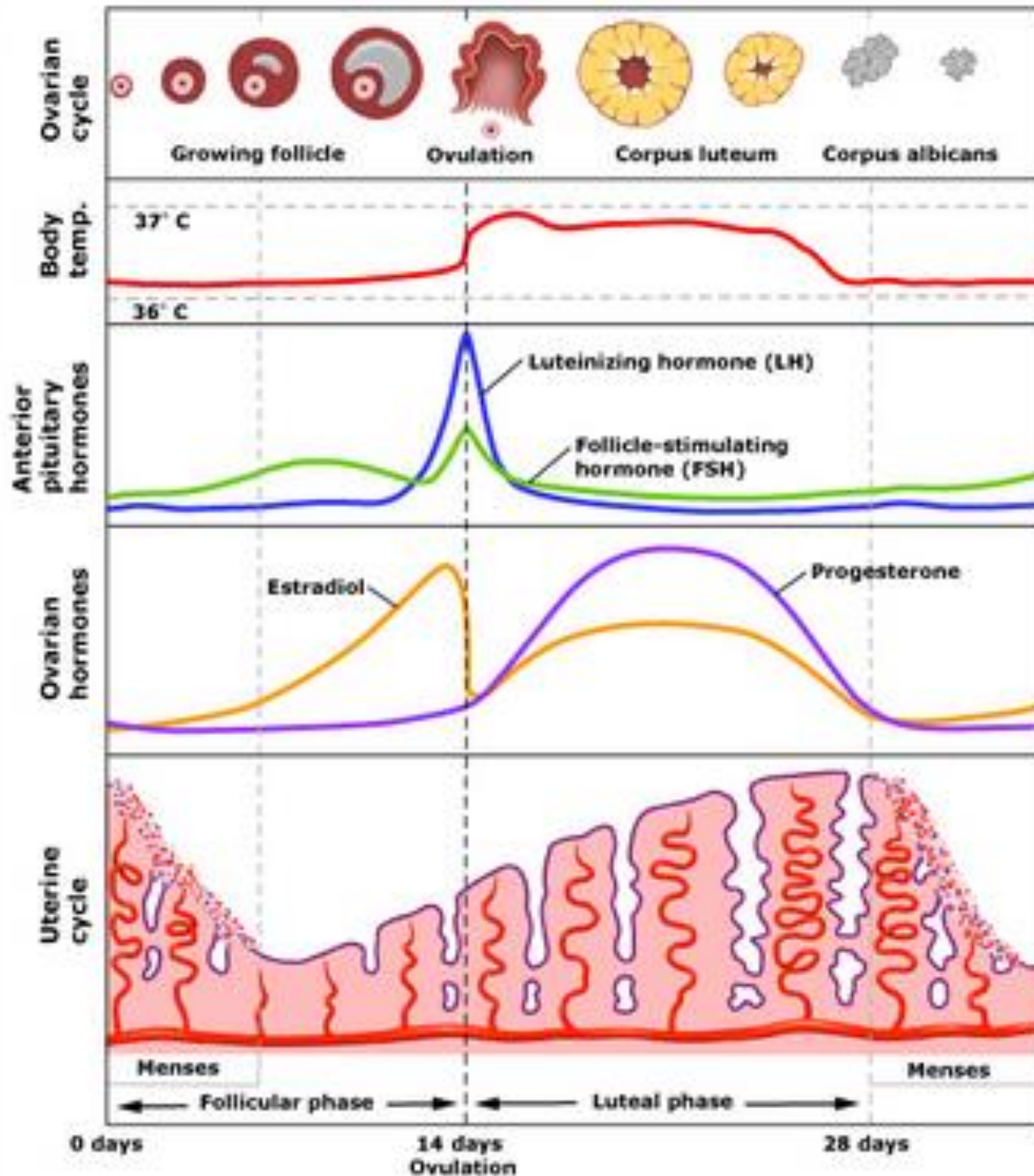


Menstruation cycle

1. Menstruation phase
2. Proliferation phase
3. Secretory phase
4. Ischemia



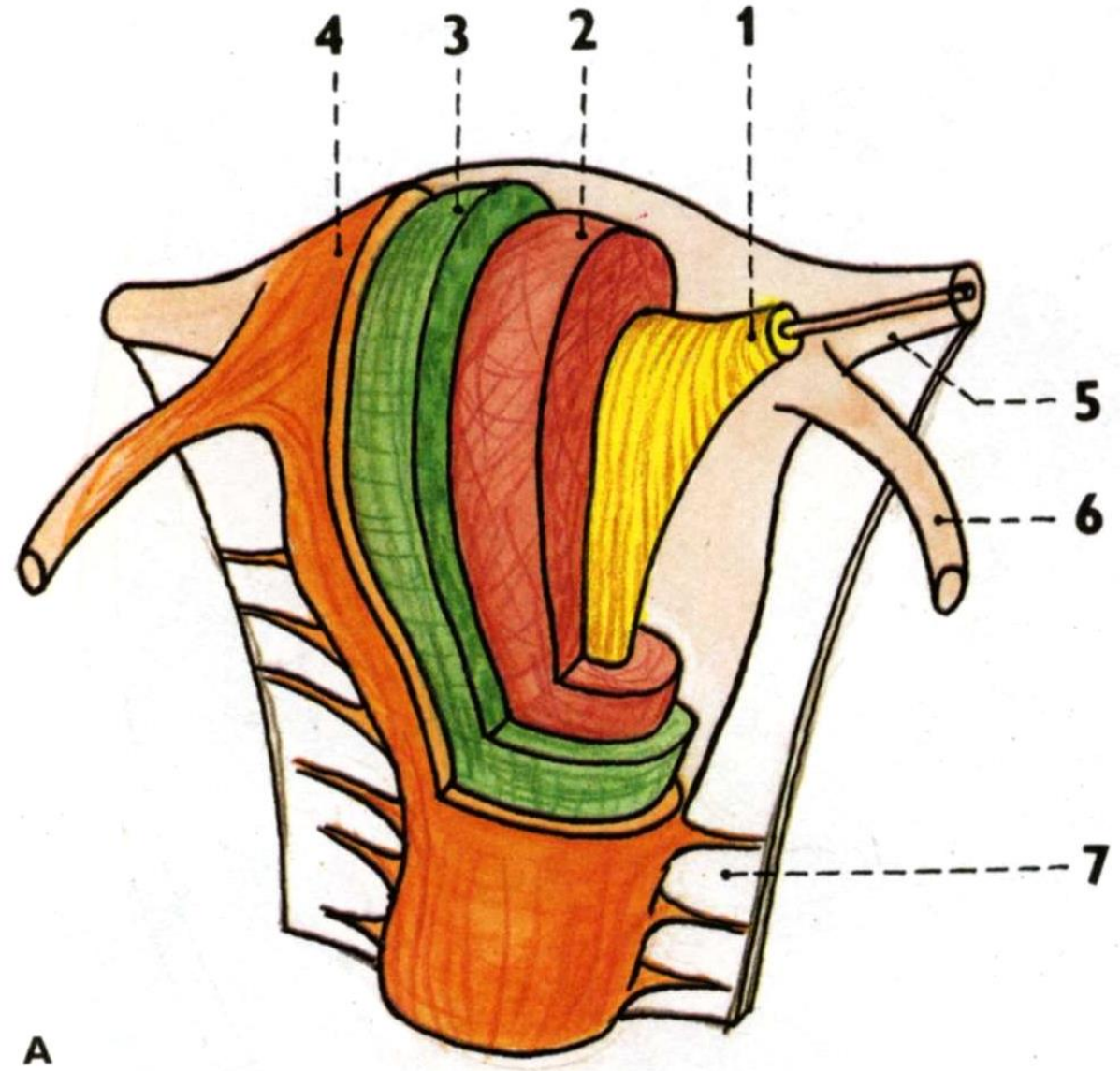
Ovarian and uterine cycles



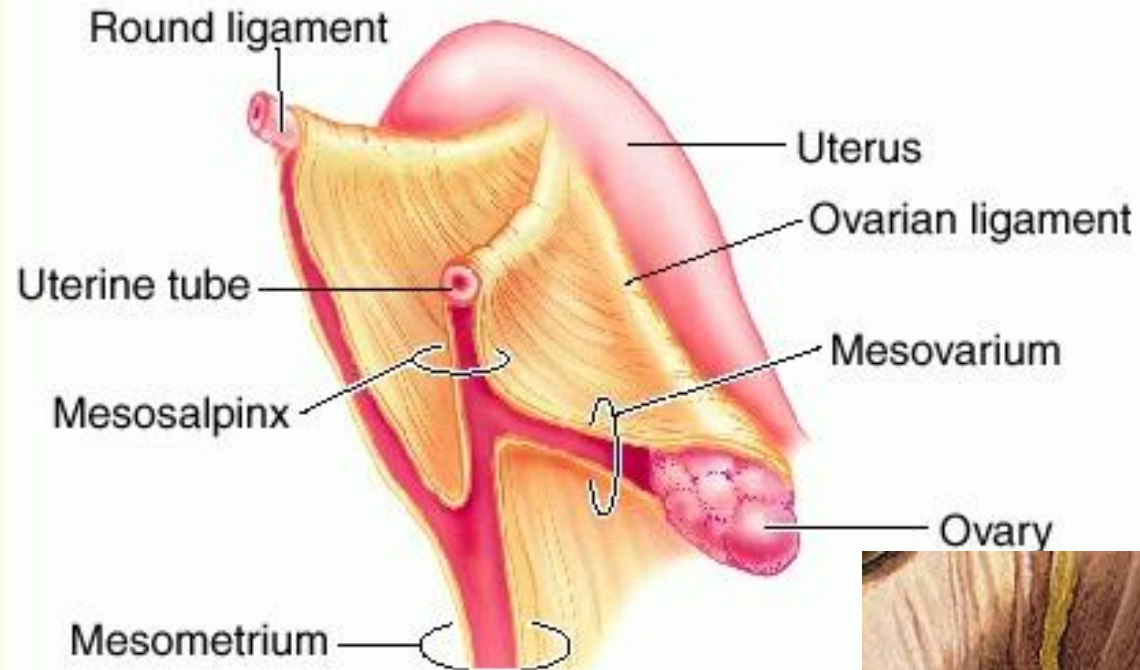
Ovarian cycle	Events	Uterine cycle	events
Follicular phase 1-13	FSH secretion begins Follicle maturation occurs Estrogen secretion is prominent	Menstruation days 1-5 Proliferative phase 6-13	Endometrium breaks down Endometrium rebuilds
Ovulation 14	LH spike occurs		
Luteal phase 15-28	LH secretion continues Corpus luteum forms Progesterone secretion is prominent	Secretory phase (15-28)	Endometrium thickens, and glands are secretory

MYOMETRIUM

1. stratum submucosum
2. stratum vasculosum
3. stratum supravasculosum
4. stratum subserosum



PERIMETRIUM (VISCERAL PERITONEUM)

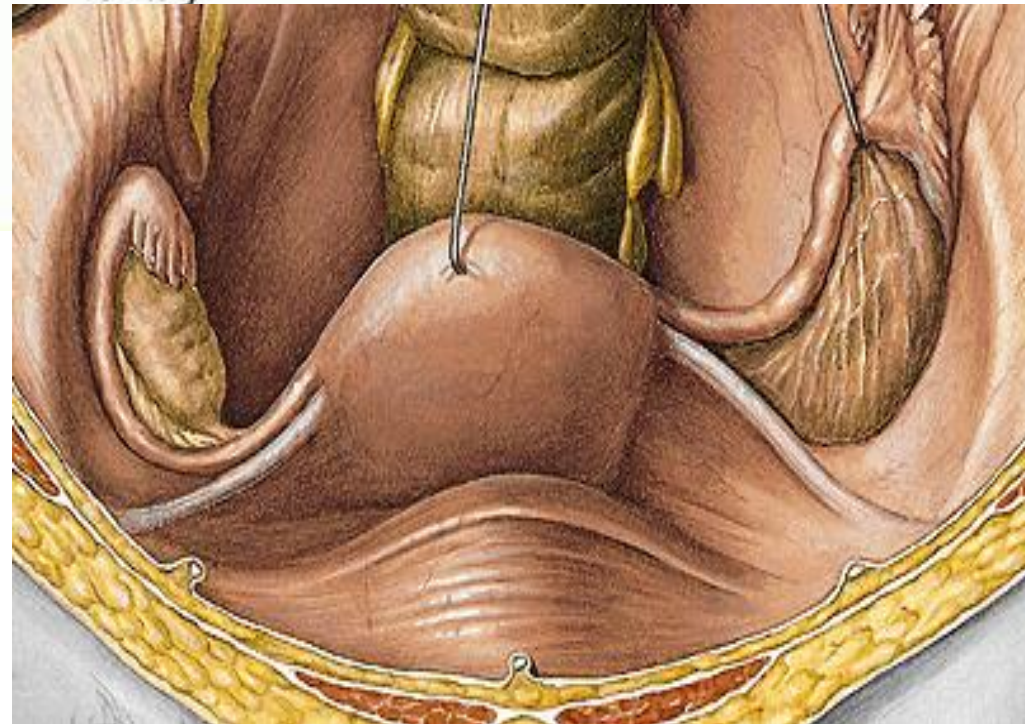


Lig. latum uteri

Mesosalpinx

Mesovarium

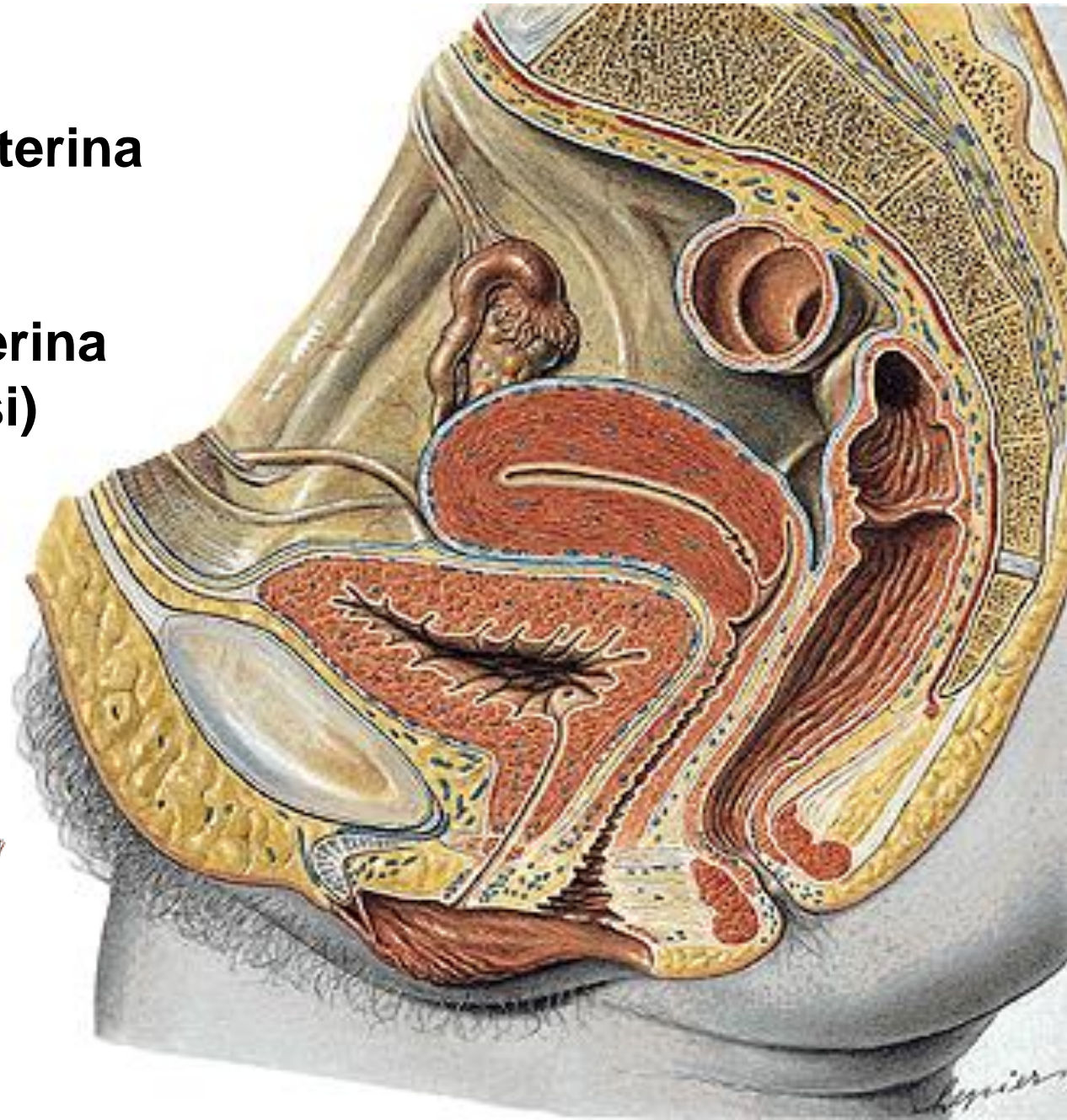
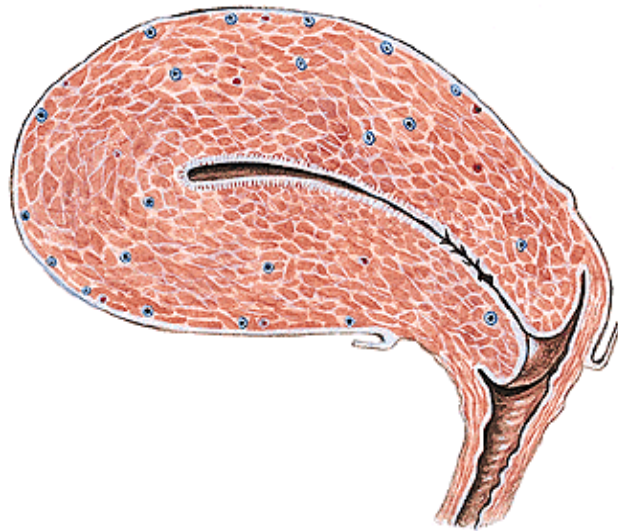
Lig. teres uteri



PERIMETRIUM

Excavatio vesicouterina

**Excavatio rectouterina
(cavum Douglasi)**



PARAMETRIUM

Lig. pubouterinum

lig. pubovesicale

lig. vesicouterinum

Lig. cardinale uteri

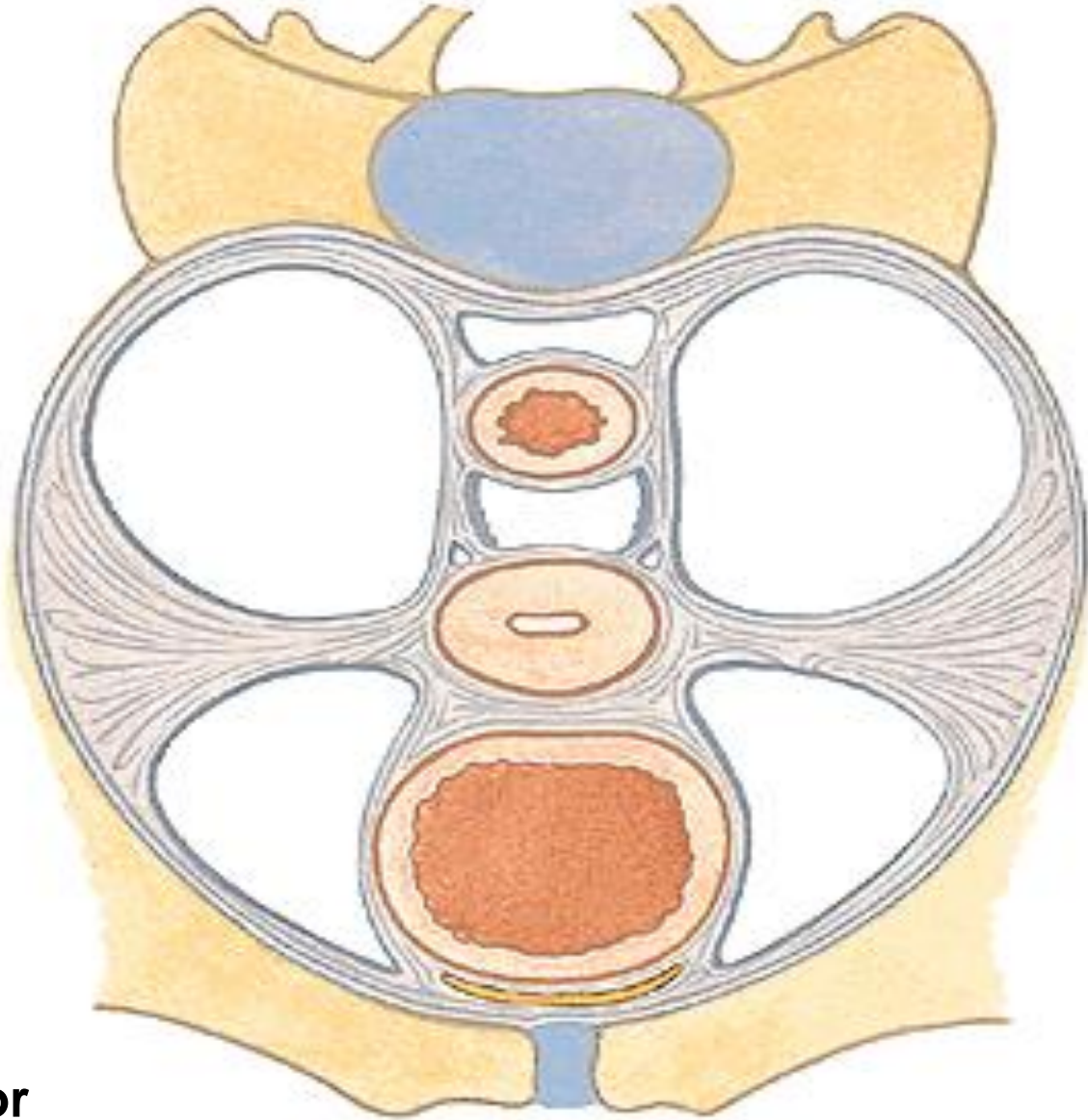
Lig. sacrouterinum

plica sacrouterina

m. rectouterinus

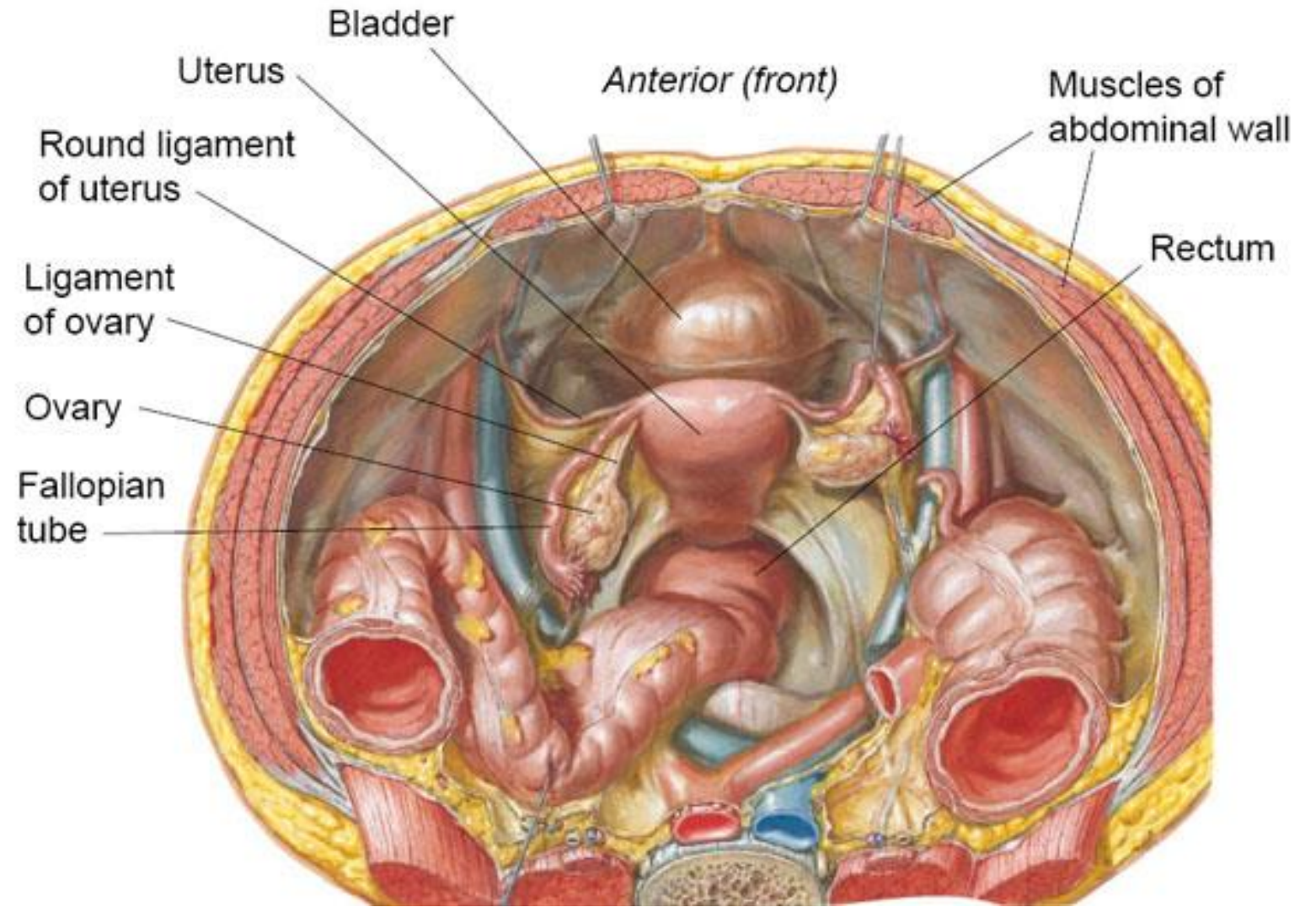
Lig. teres uteri

**Part of fixation apparatus
Together with the pelvic floor**



Plica sacrouterina

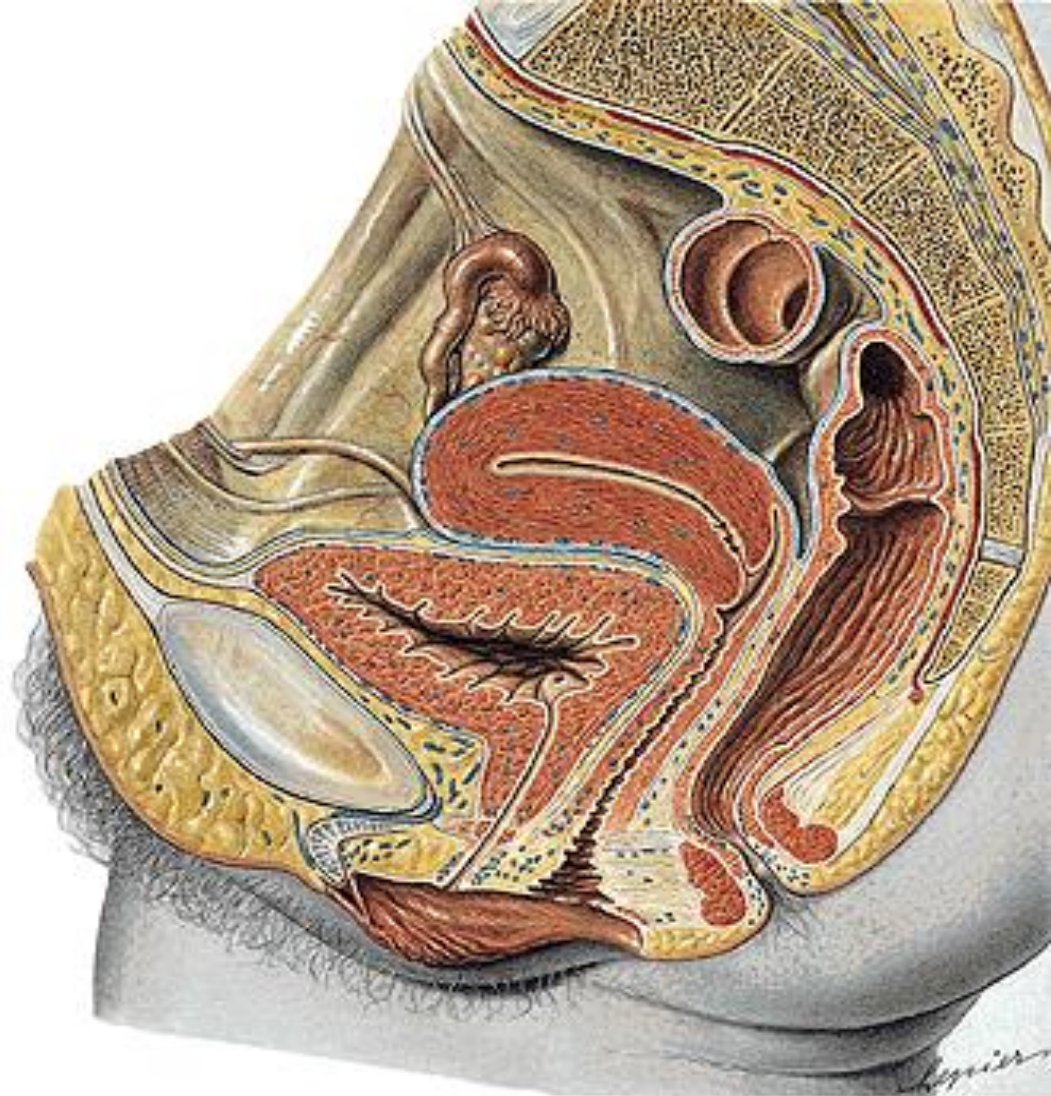
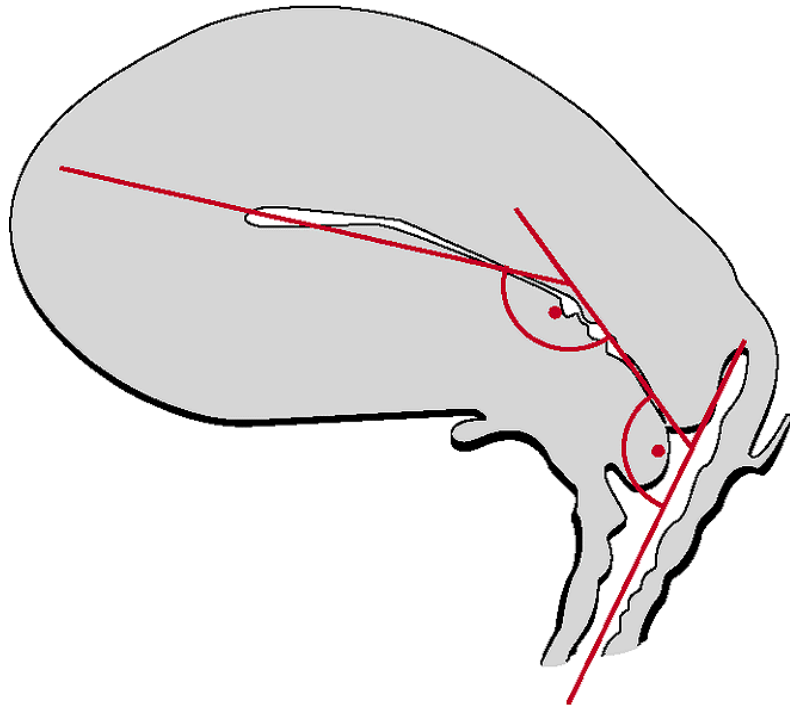
Lig. teres uteri



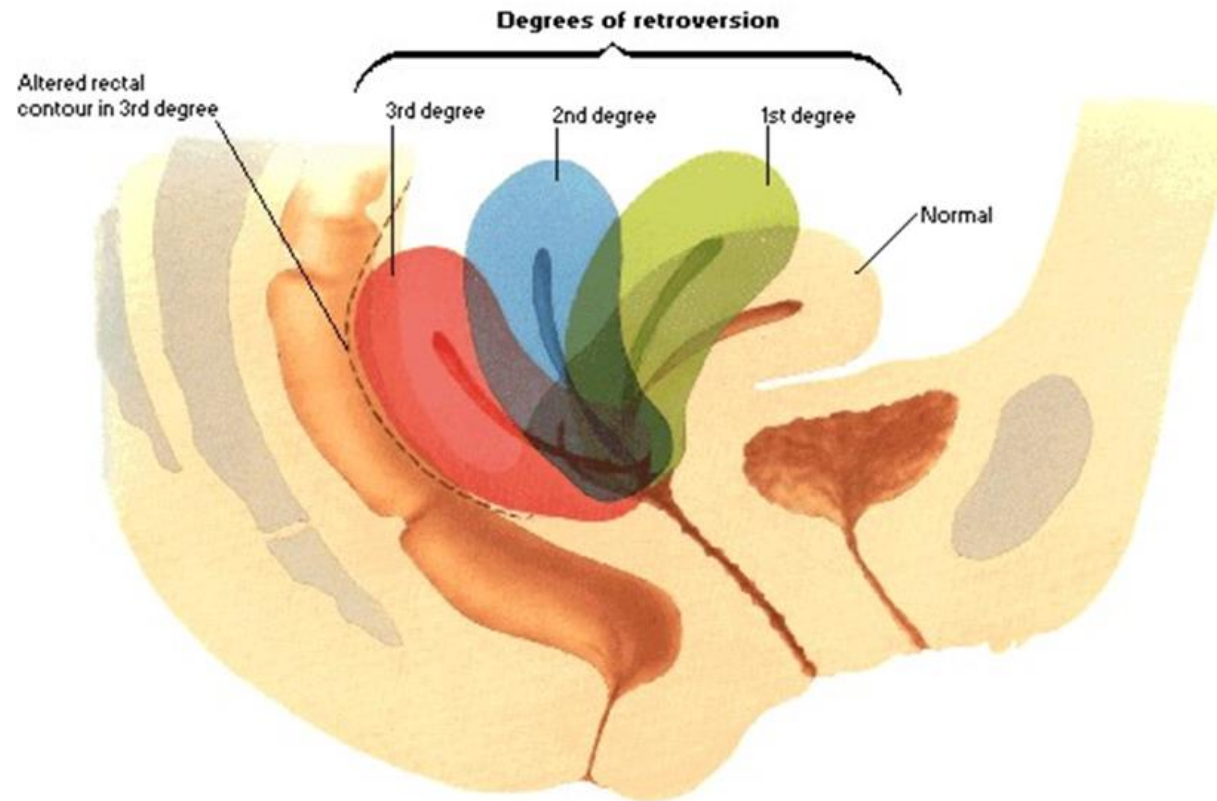
POSITION OF UTERUS

Anteversion (70° – 100°)

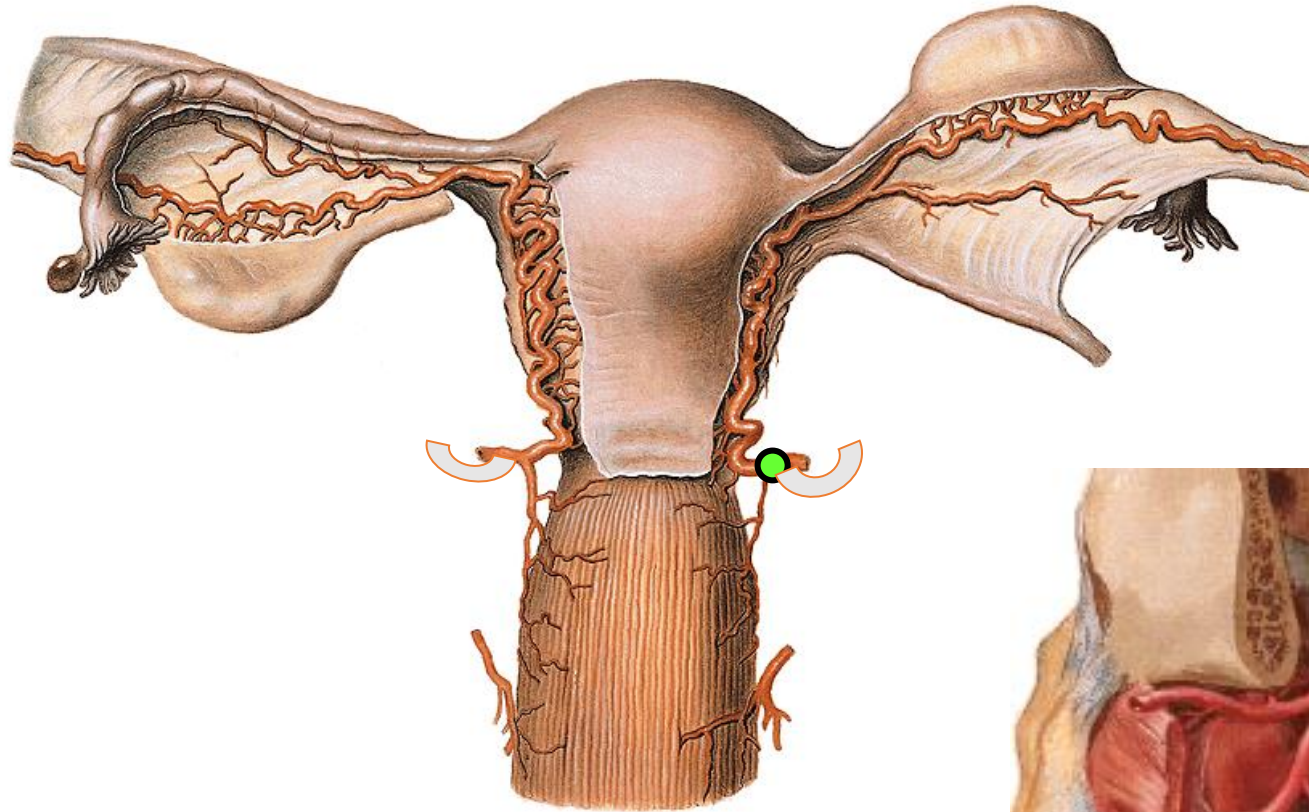
Anteflexion (100°)



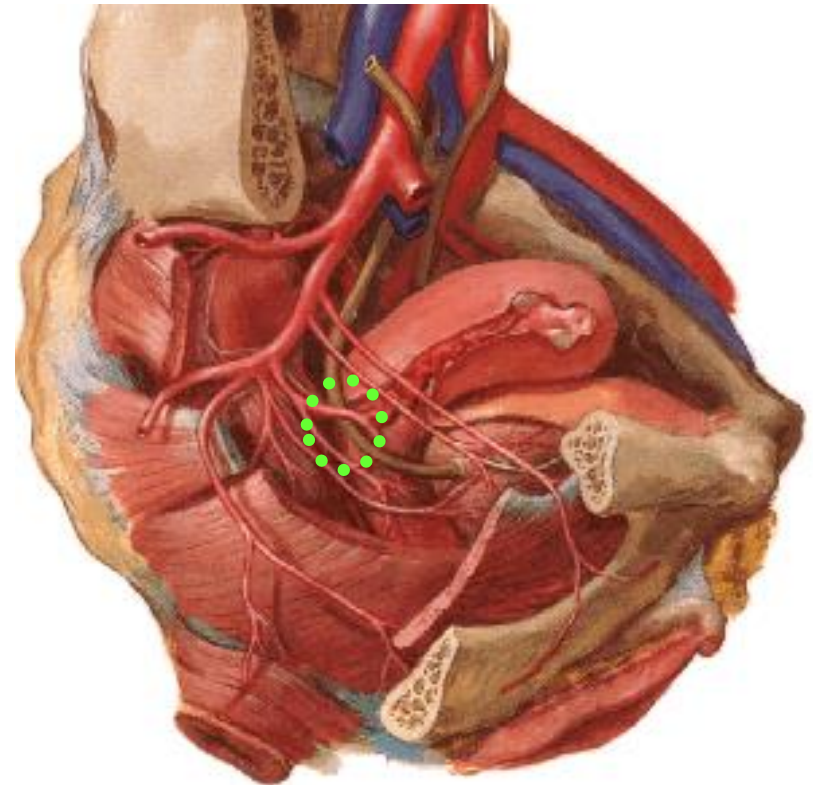
POSITION OF UTERUS

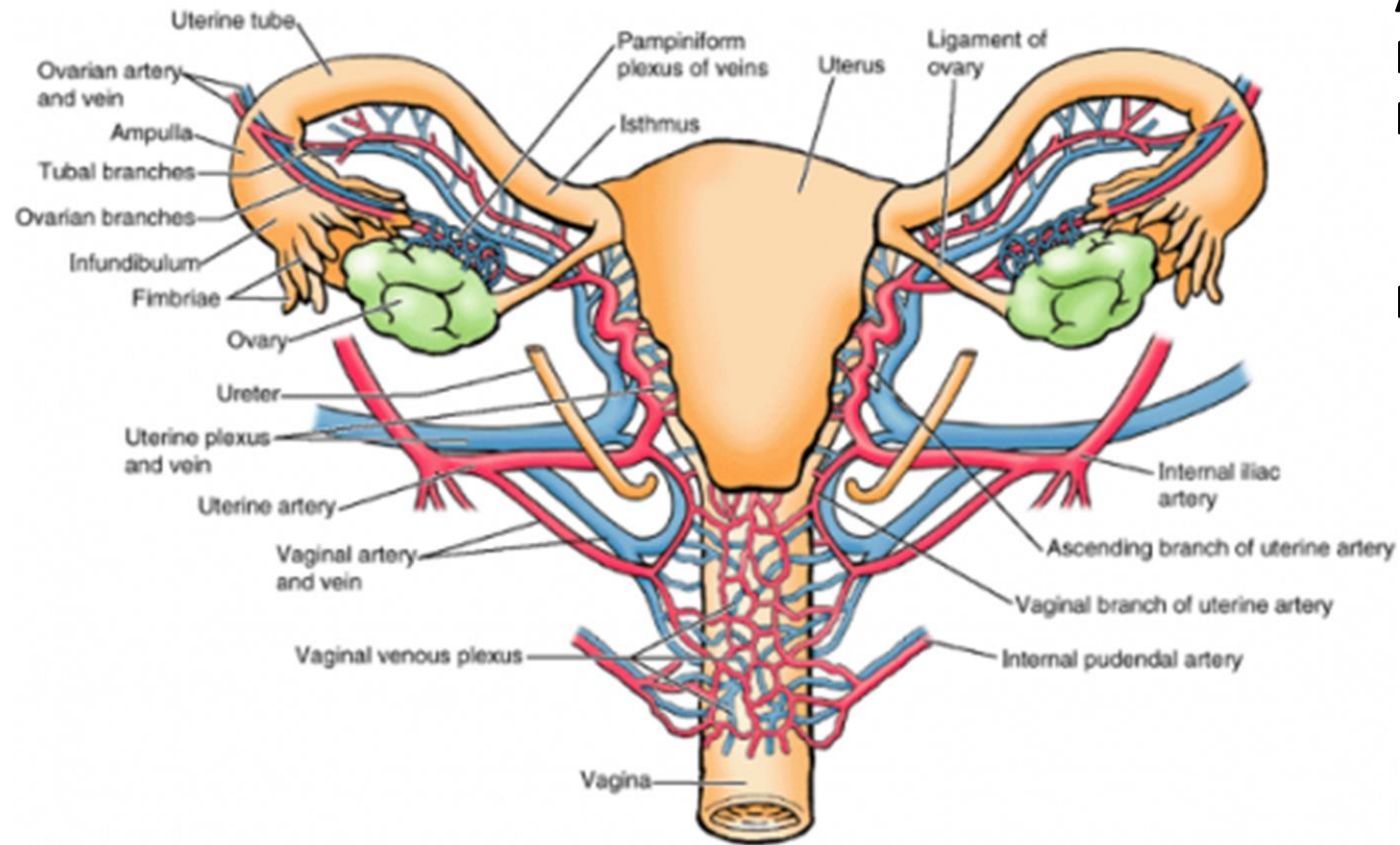


Arteria uterina – anastomosis with a. ovarica (ovarian arcade)



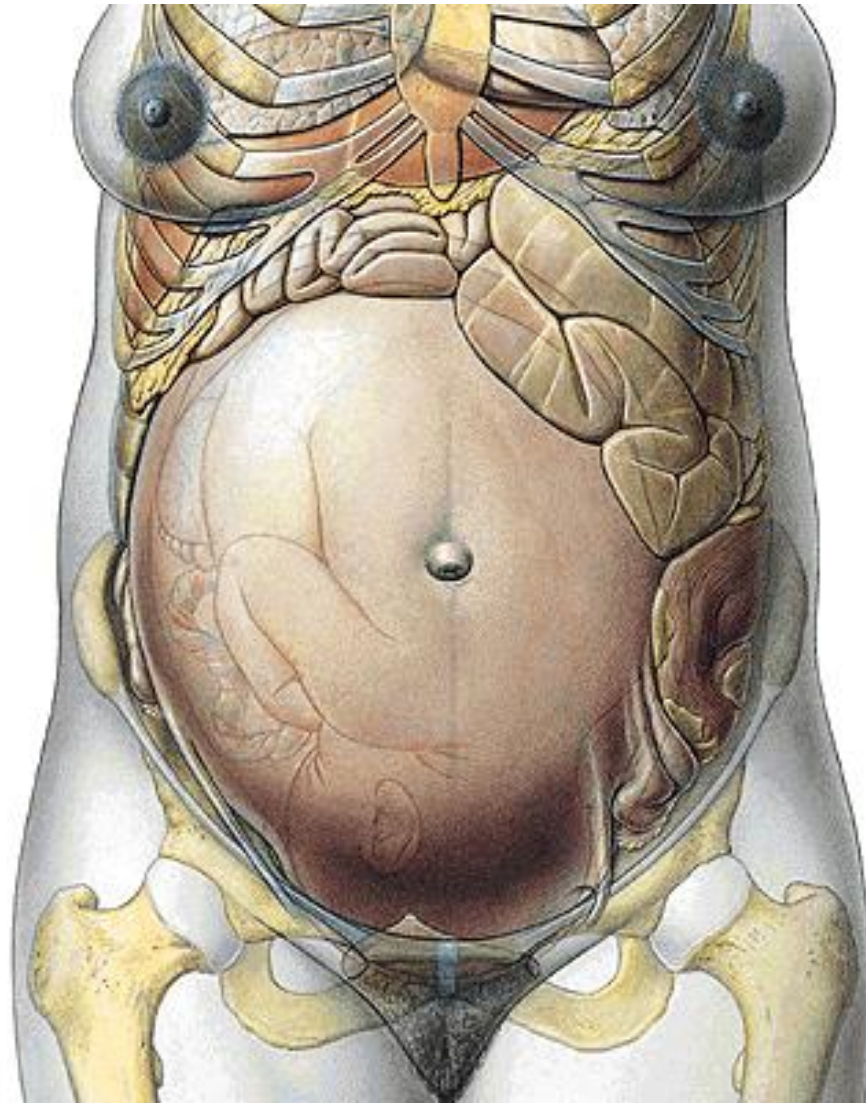
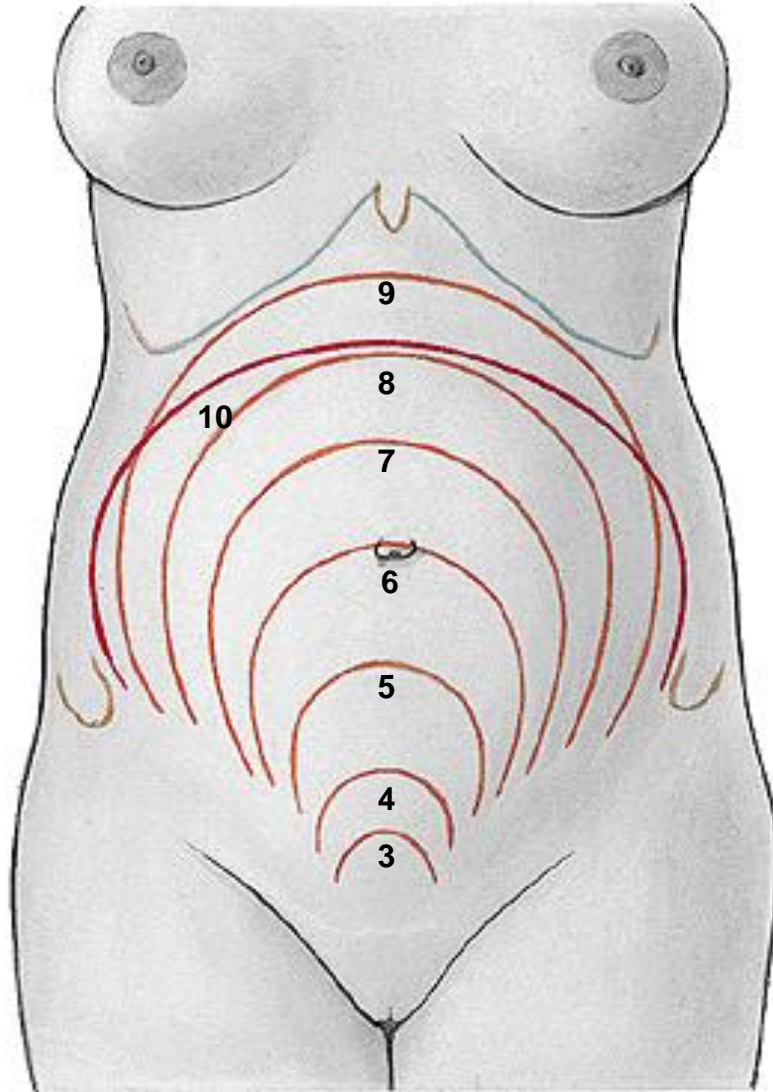
**Uterine artery crosses ureter
(2 cm from uterine margine
1,5 cm from fornix vaginae)**





A. uterina x ureter
Plexus venosus uterovaginalis
III. lumbales, iliaci int., iliaci ext.
nodus lymph.uterinus (Bayer),
inguinales spf., sacrales
Plexus uterovaginalis

GRAVIDITY





uterus graviditatis – 1000 g

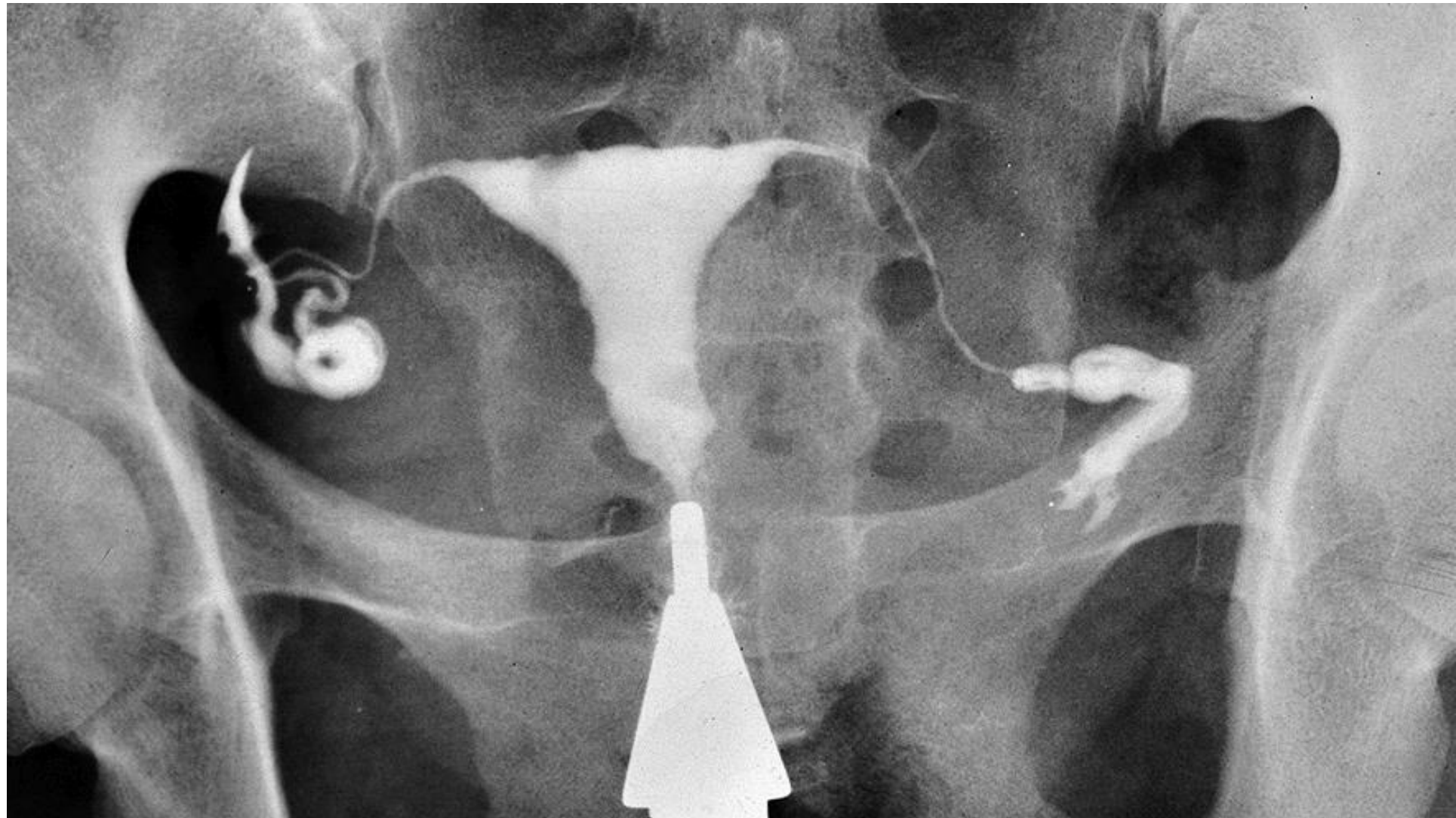
Placenta

Funiculus umbilicalis – 50 cm

(v.umbilicalis, aa. umbilicales)



HYSTEOSALPINGOGRAPHY



VAGINA

Position of vagina

Ventrocaudal direction

Ventrally:

urinary bladder

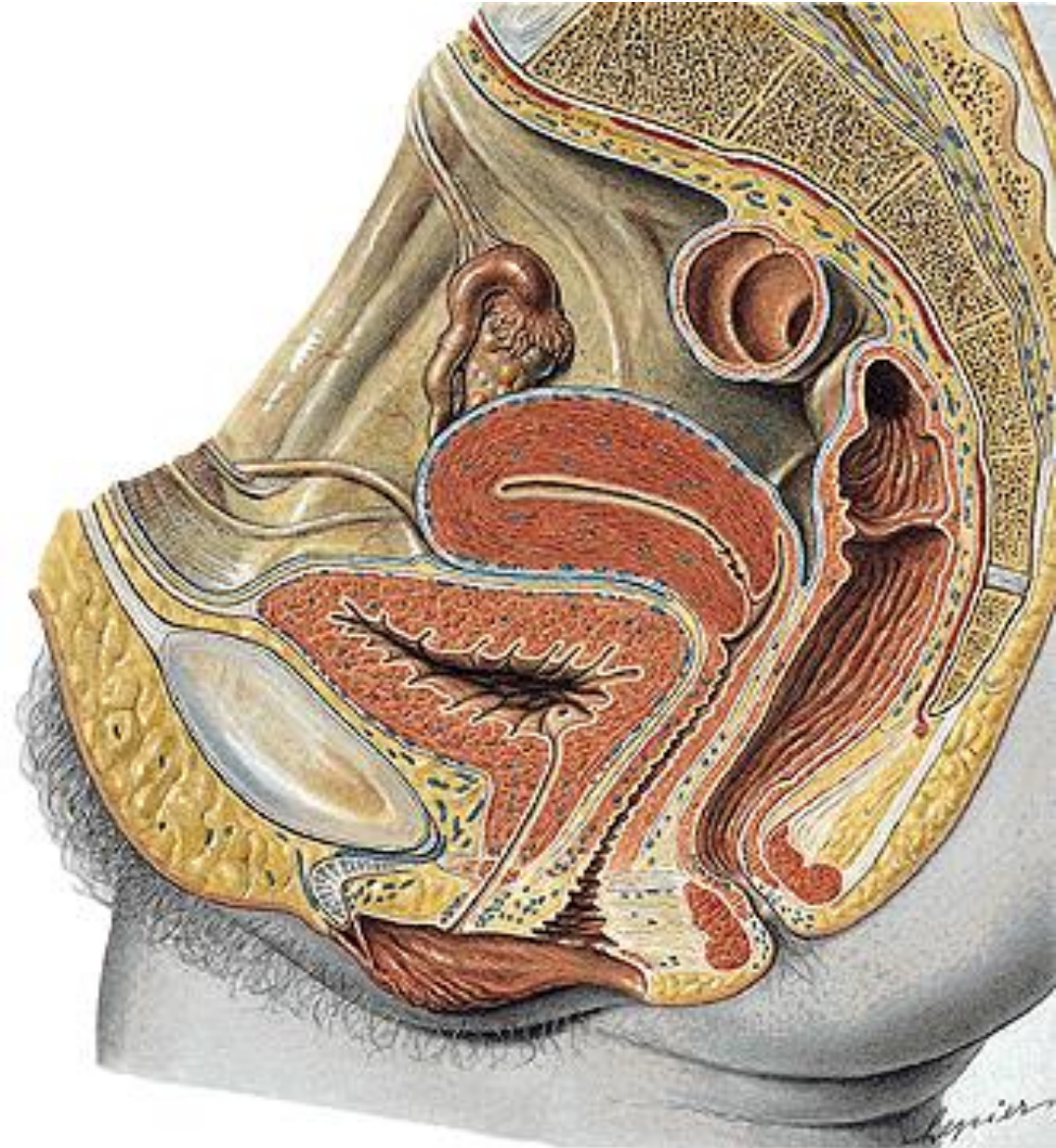
urethra - septum urethrovaginale

Dorsally:

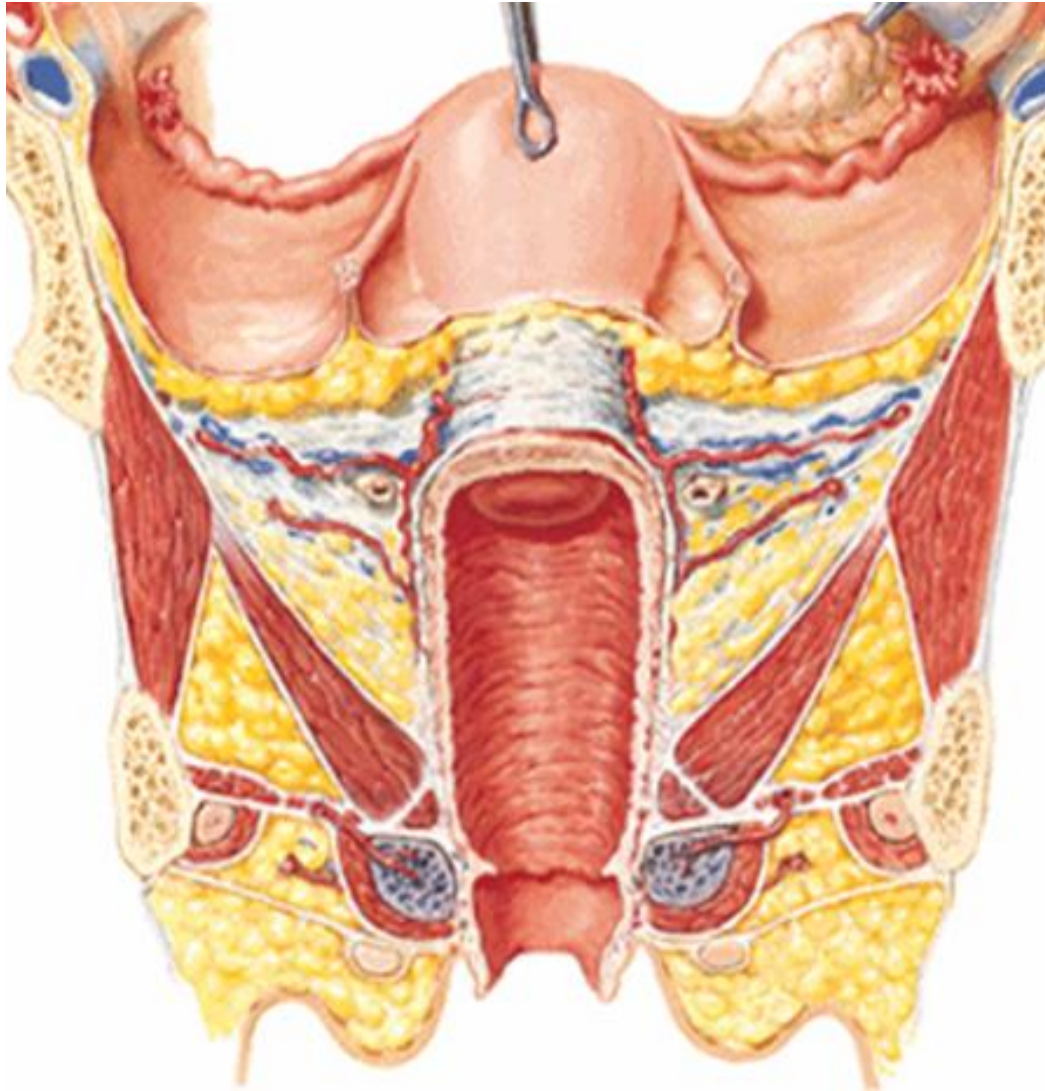
excavatio rectouterina

rectum - septum rectovaginale

centrum perineale



VAGINA (KOLPOS)



Fornix vaginae

pars anterior et posterior

receptaculum seminis

Paries anterior

crista urethralis

area trigonalis vaginae

Paries posterior

Rugae vaginales

Columna rugarum ant. et post.

**Ostium vaginae
(vestibulum vaginae)**



Ostium urethrae ext.

Ostium vaginae

Ostium vaginae - hymen

Defloration

Carunculae hymenales



ANNULAR
HYMEN



SEPARATE
HYMEN



CRIBRIFORM
HYMEN



PAROUS
INTROITUS

HISTOLOGY OF VAGINA

Mucouse membrane

Multilayer squamous epithelium

No glands !!!

submucouse tissue – venous net

Muscular layer

inner - circular

outer - longitudinal

Adventicia (paracolpium)

Serosa – excavatio rectouterina

A. uterina

- a. vaginalis

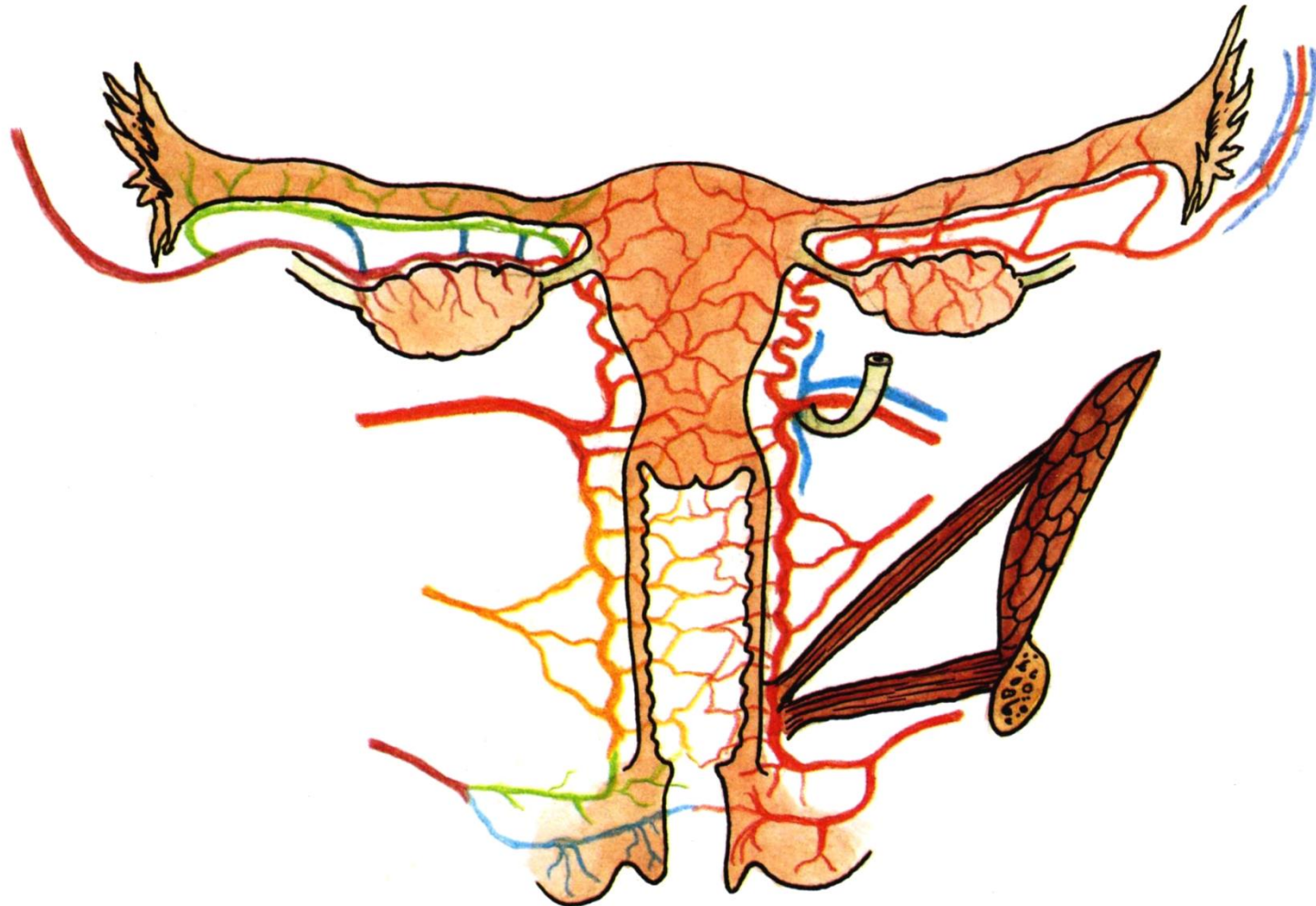
A. rectalis media

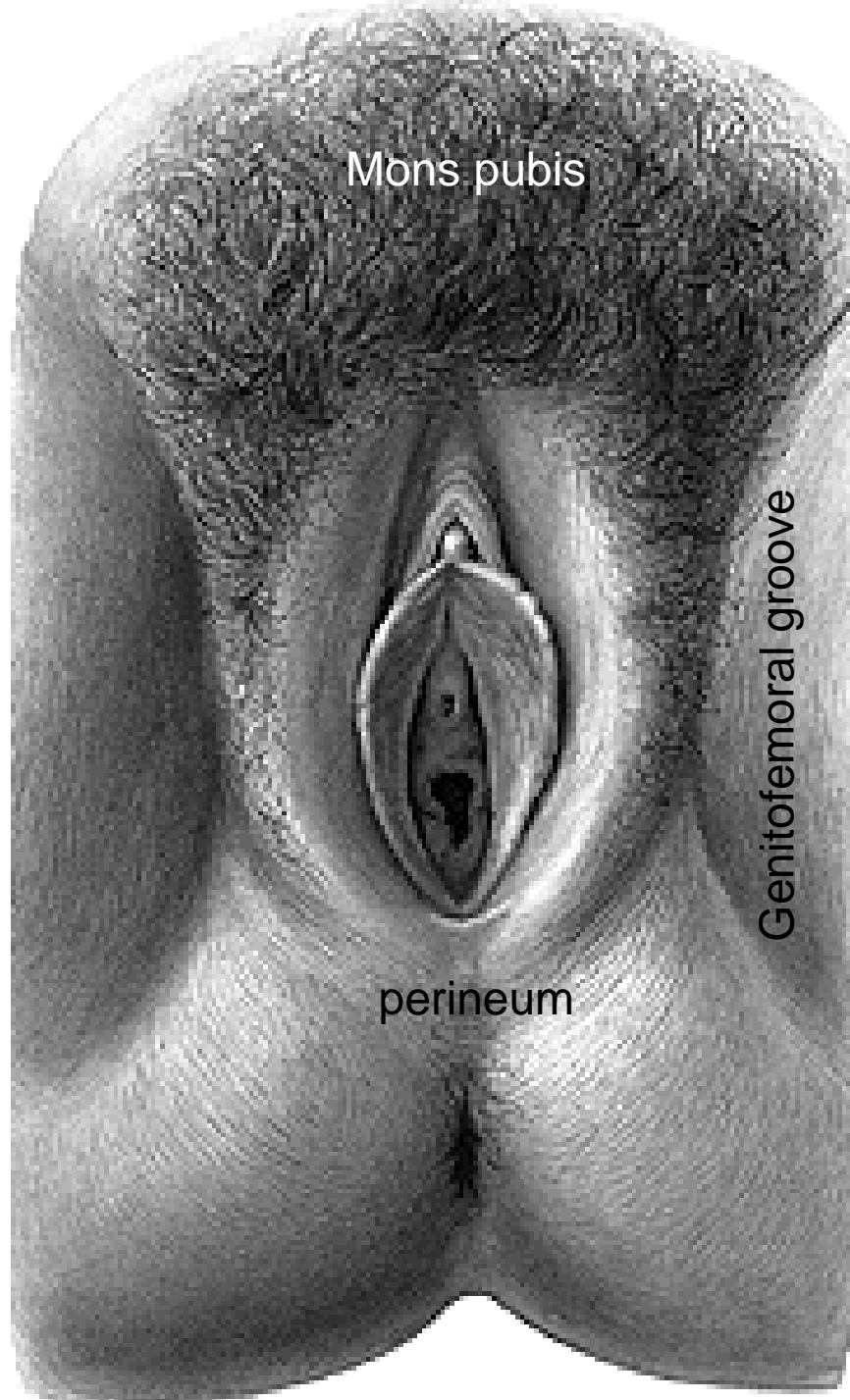
A. pudenda int.

Plexus venosus uterovaginalis

Nll. iliaci int., ext, inguinales spf.

Plexus uterovaginalis, n. pudendus





Organa genitalia feminina externa

Mons pubis (pubes, fatty tissue)

Labia majora pudendi

Labia minora pudendi

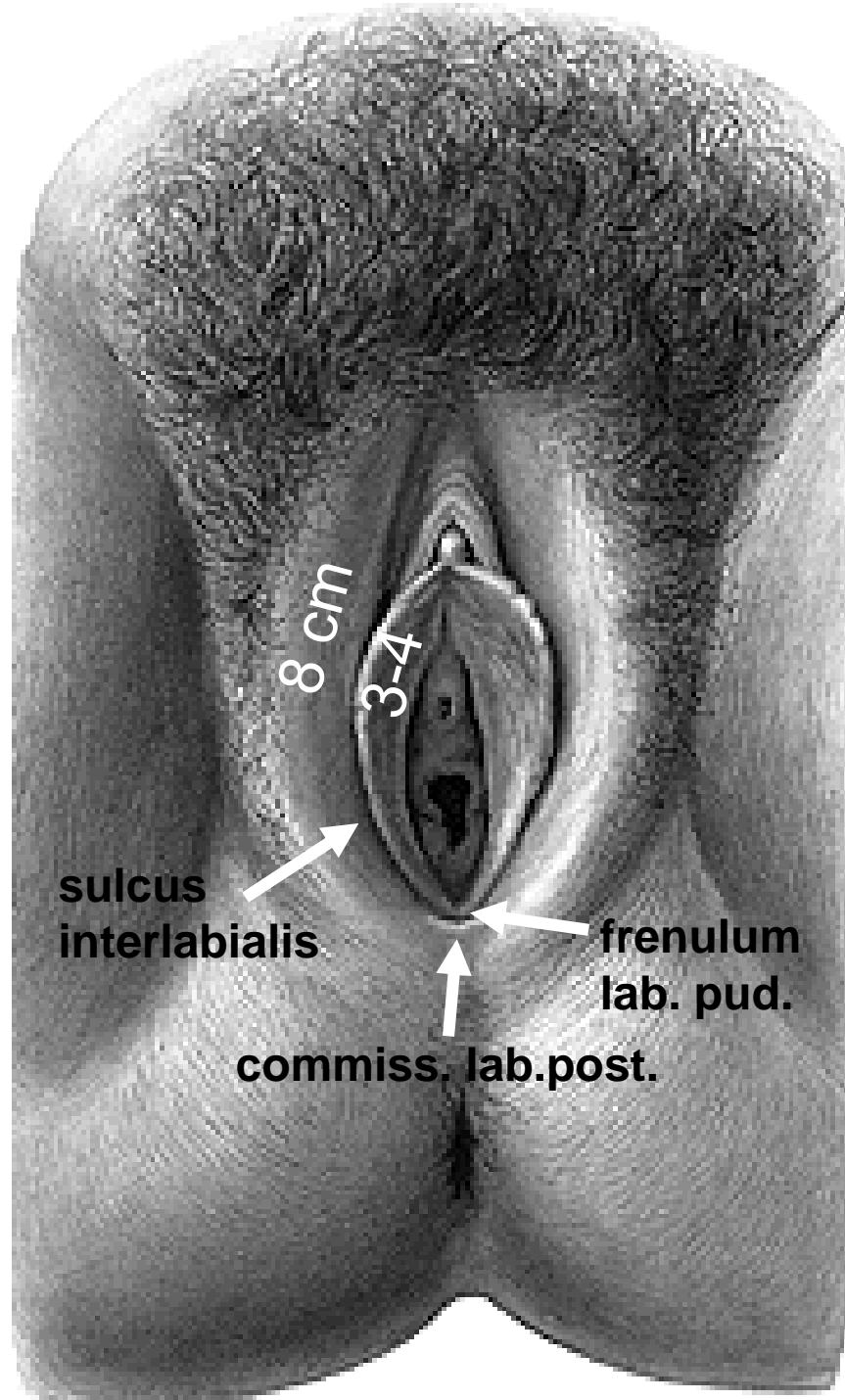
Vestibulum vaginae

Clitoris

Bulbi vestibuli

Gll. vestib. maj. et min.





Labia majora pudendi

Sulcus genitofemoralis

Rima pudendi

Commissura labiorum ant.

Perineum (raphe perinei)

Connective tissue, fat

lig. teres uteri

Labia minora pudendi



Sulcus interlabialis

Vestibulum vaginae

Smegma – sebaceous glands

**Elastic and collagenous connective tissue,
venous plexus, nerve endings**

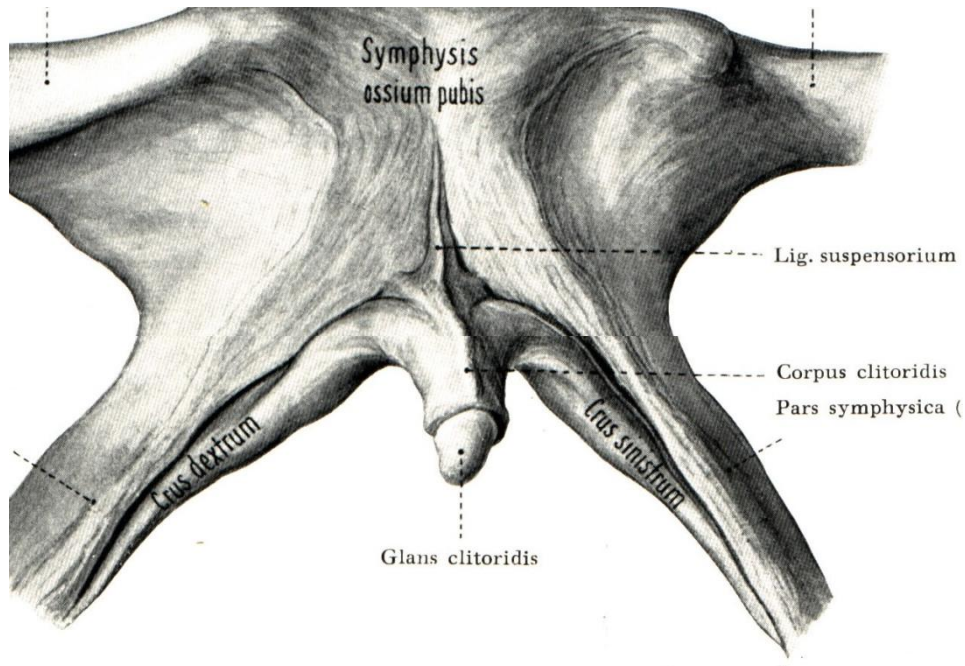
Frenulum labiorum pudendi

Fossa navicularis
between vagina and frenulum

Praeputium clitoridis

Frenulum clitoridis





CLITORIS

**Crura clitoridis
(crista phallica)**

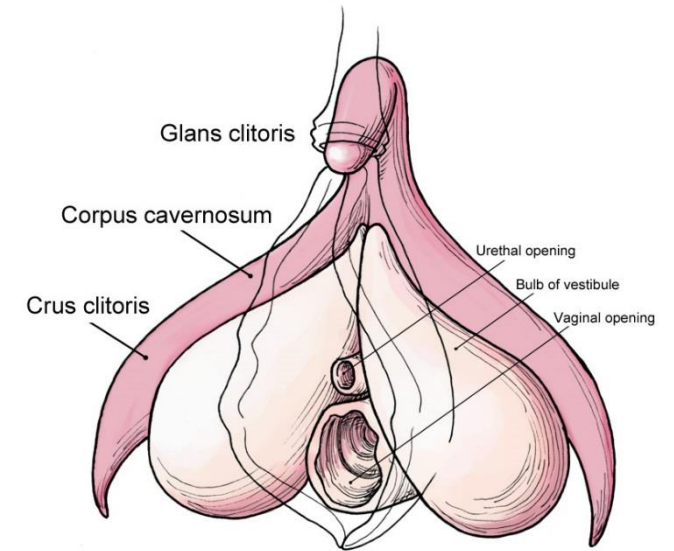
Corpus clitoridis

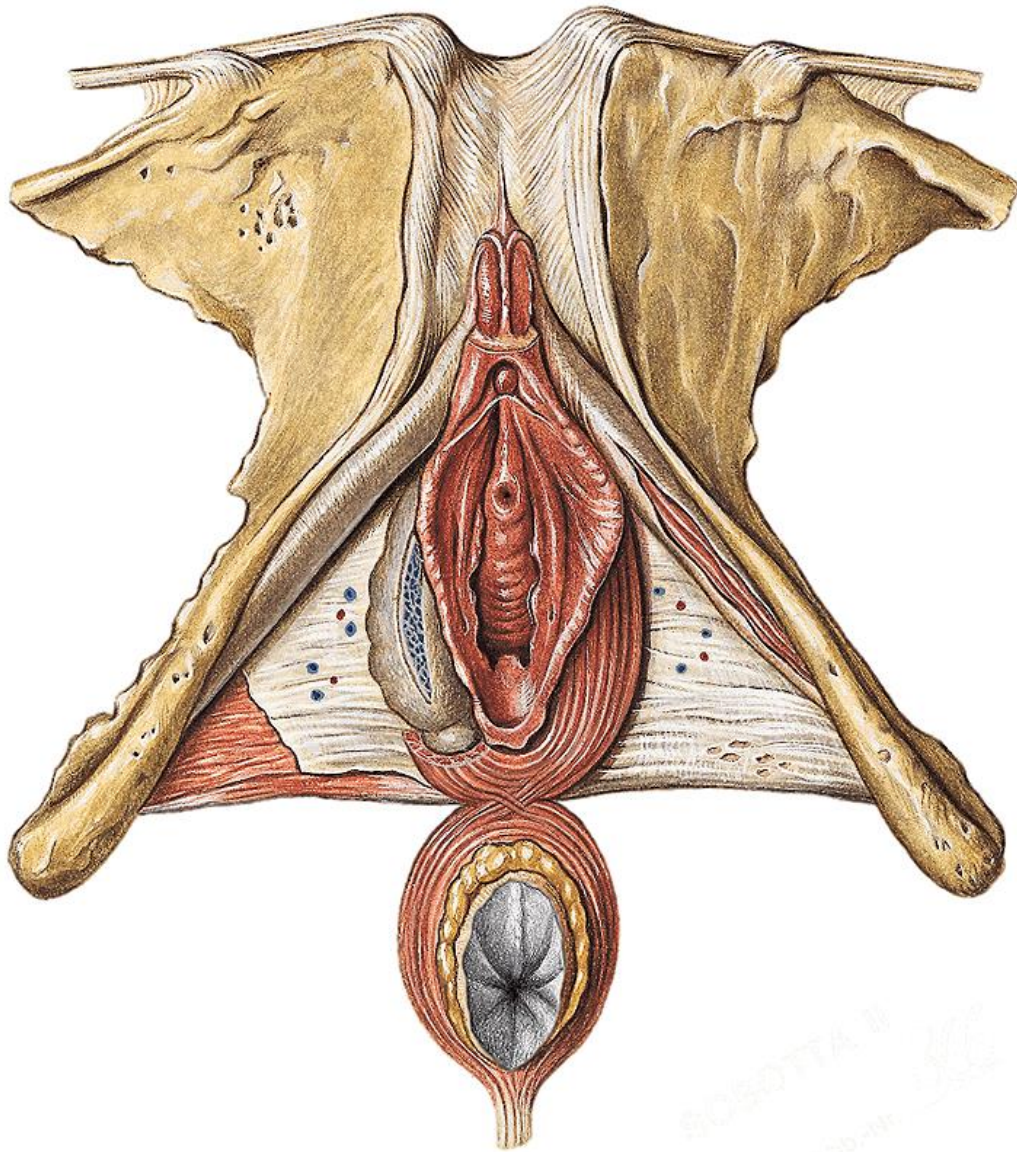
Glans clitoridis

Praeputium clitoridis

Frenulum clitoridis

Corpora cavernosa clitoridis





Lig. fundiforme clitoridis

Lig. suspensorium clitoridis

M. ischiocavernosus

VESTIBULUM VAGINAE

between labia minora pudendi

Glans clitoridis
(praeputium et frenulum clitoridis)

Ostium urethrae externum
(papilla urethralis, gl. vestib. minores
- between ostium urethrae et. and
vestibule of the vagina, rare in human females)

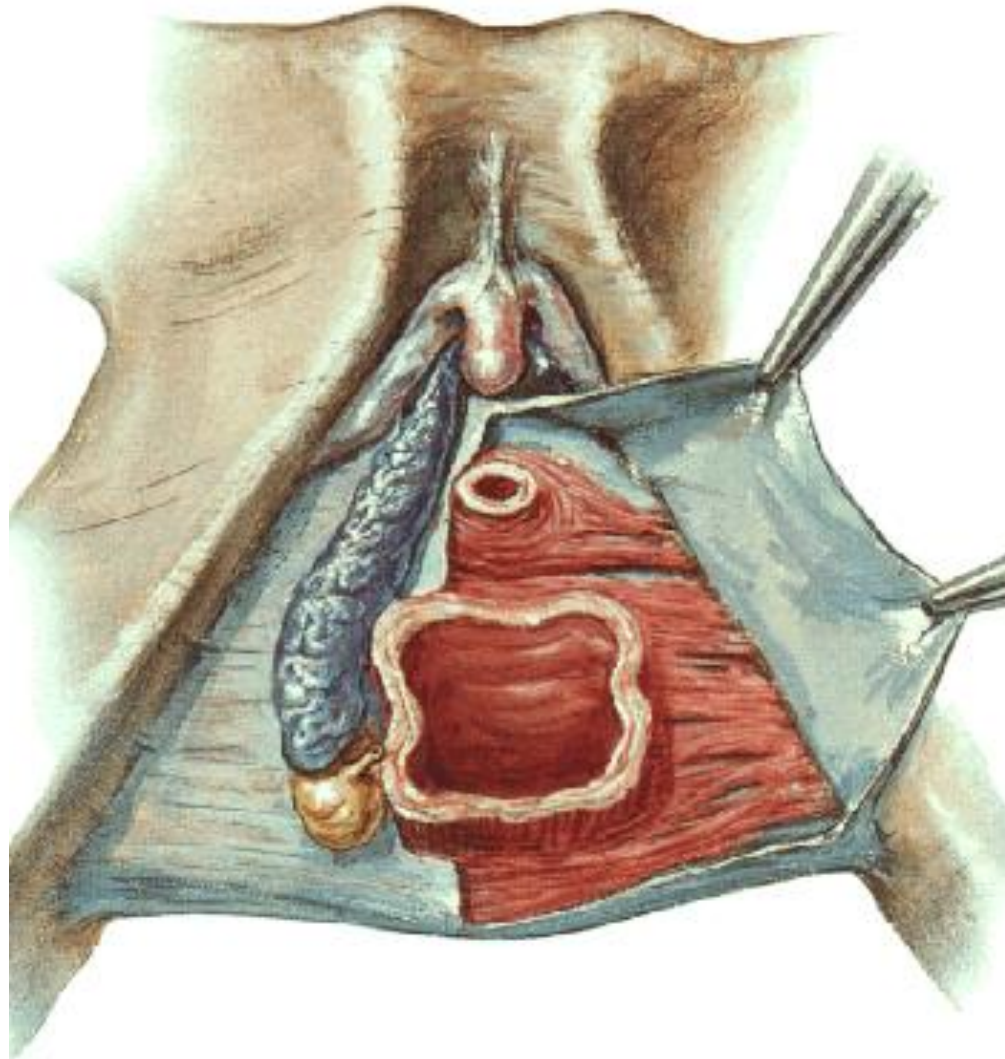
Ostium vaginae (hymen)

Fossa navicularis

Frenulum labiorum pudendi
(commisura labiorum pudendi)



BULBI VESTIBULI



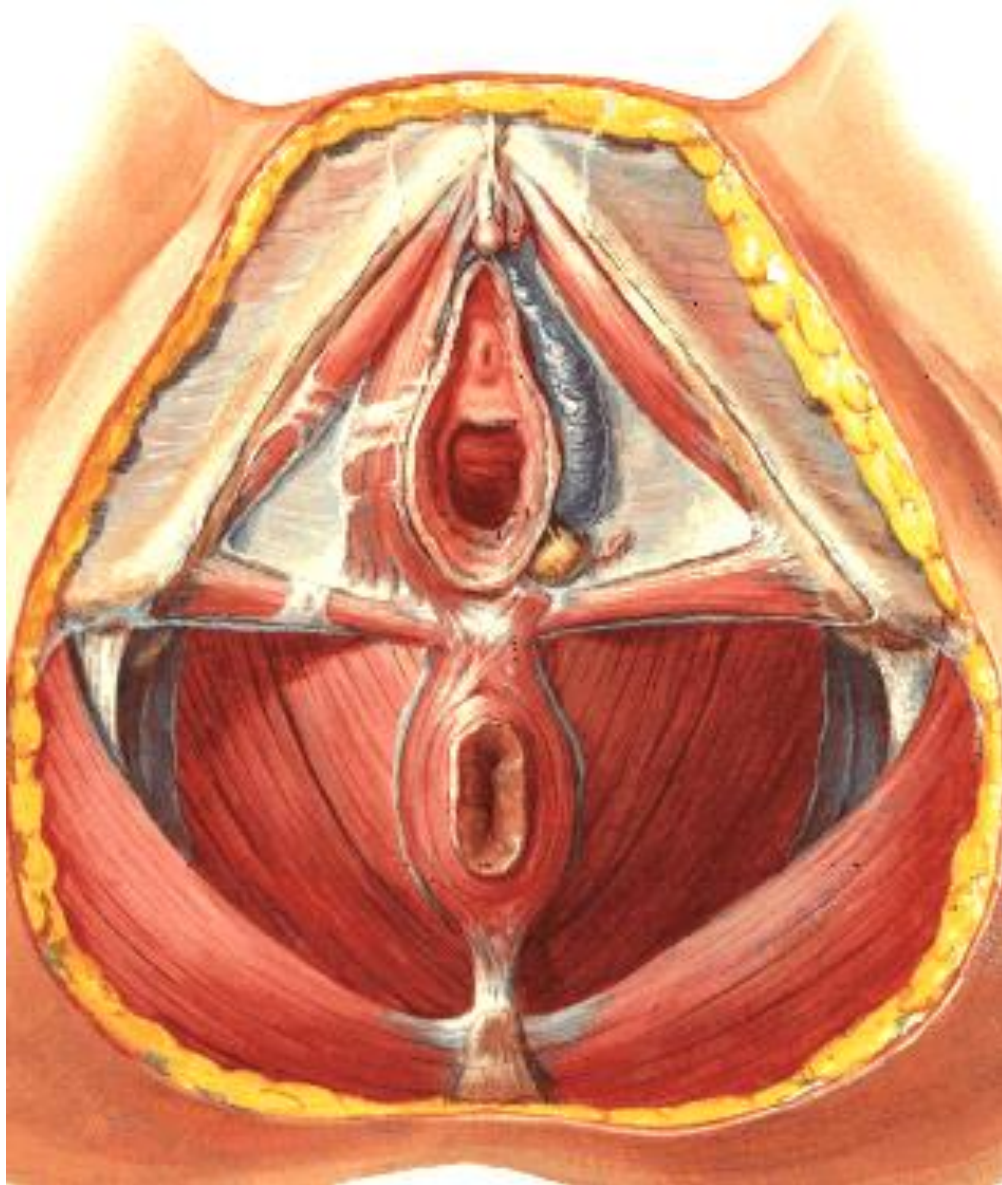
**Erectile bodies
(corpus spongiosum)**

**On (below) diaphragma
urogenitale**

**m. bulbospongiosus
(from centrum tendineum
perinei to the dorsum
clitoridis)**

**commisura bulborum
(between glans clitoridis and
ostium urethrae ext.)**

GLANDULAE VESTIBULARES MAJORES (BARTHOLINI)



**On the diaphragma
urogenitale
Dorsally from bulbi
vestibuli**

m. bulbospongiosus

**Open to the vestibulum
vaginae**

Thank you for your attention



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Čihák R: Anatomie 2 (Splanchnologia). Avicenum, zdravotnické nakladatelství, Praha, 1988.

Sobotta, Putz,R., und Pabst,R. Atlas der Anatomie des Menschen 20. Auflage. München: Urban & Schwarzenberg, 1993

Neil A. Campbell, Jane B. Reece, Lisa Urry, Michael L. Cain et al.: Biology: A Global Approach (10th International Edition), 2014.

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