LECTURE 2:
Female Reproductive S.

❑ Objectives:

At the end of this lecture, you should be describing:

Describing the histological structure and fate of the ovarian follicles.

the microscopic structure of :

1. **Ovary.**
2. **Oviducts (Fallopian tubes).**
3. **Uterus.**
4. **Vagina.**
5. **Placenta.**
6. **Resting and lactating mammary gland.**
7. **fate of ovarian follicles.**

Female Reproductive System

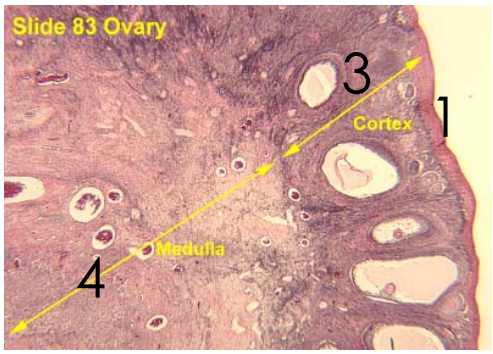
Primary sex organs:	Secondary sex organs:
• 2 ovaries.	• 2 Fallopian tubes. • Uterus. • Vagina. • External genitalia. • 2 mammary glands.

ADULT OVARY

1-Germinal epithelium:*	2-Tunica albuginea:	3-Outer cortex:	4-Inner medulla:
outer layer of **flat cells.**	dense C.T layer.	**ovarian follicles** and interstitial cells.	highly **vascular** loose C.T.

Ovarian Follicles

The **cortex** of the ovary in <u>adults</u> contains the following types (stages) of follicles:



1. Primordial Follicles.
2. Primary Follicles:
3. Secondrey (ANTRAL) Follicles.
4. Mature Graafian Follicles.

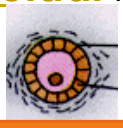
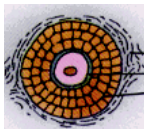
*they said it's germinal layer but actually it is a capsule from the peritoneum

1. Primordial Follicles

- The only follicles present **before puberty.**
- The earliest and most numerous stage.
- Located superficially under the tunica albuginea.
- Each is formed of a **primary oocyte** (25 µm), surrounded by a single layer of **flat follicular cells.**

2. Primary Follicles

They develop from the primordial follicles, at puberty under the effect of FSH.

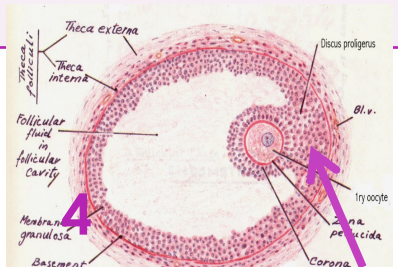
Unilaminar primary follicles:	Multilaminar primary follicles:
are similar to primordial follicles, but: the primary oocyte is larger (40 µm). the follicular cells are **cuboidal** in shape. 	• 1ry oocyte larger • corona radiata • granulosa cells • zona pellucida • theca folliculi • follicular fluid (liquor folliculi) 

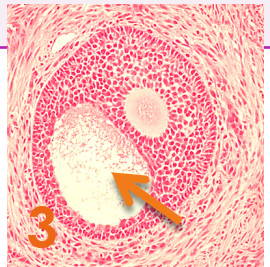
3. Secondary (Antral) Follicles

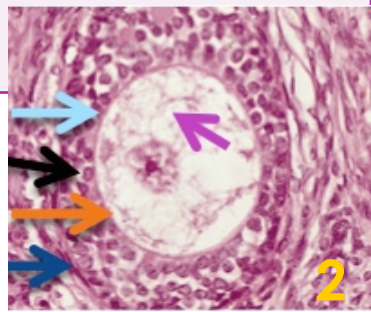
- Multilaminar primary follicles become secondary follicles when a **complete antrum** *(arrow)* filled with **liquor folliculi** is formed.
- 1ry oocyte is larger & pushed to one side.
- Theca folliculi differentiates into **theca interna** and **theca externa.**

4. Mature (Graafian) Follicle

large, thin walled ,wide follicular antrum ,**large 1ry oocyte**
zona pellucida ,corona radiata ,**cumulus oophorus** *(arrow)*
zona granulosa ,**basement membrane**
theca folliculi: **theca interna & theca externa**



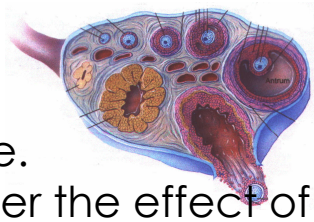




Atretic Follicles

What happened when the Follicle don't get mature ?
During growth of the ovarian follicles, many of them **do not reach maturation** and they degenerate, and are finally replaced completely by **fibrous tissue** and are called **atretic follicles** **or** **corpora atretica**.

Ovulation and Corpus Luteum Formation



What is ovulation ?

- When the follicle rupture and give me oocyte.
- Ovulation occurs at day **14** of the cycle, under the effect of **LH.**

What is corpus luteum ?

- The follicle collapses and forms a corpus luteum.

corpus luteum

No fertilization	Corpus luteum of menstruation	lasts about 10 days.
Fertilization	Corpus luteum of pregnancy	persists for six months.
Fate of corpus luteum	degenerated fibrous body.	Called (corpus albicans)
Bleeding may occur	corpus haemorrhagicum.	
zona granulosa	granulosa lutein cells	secrete progesterone
Theca interna	theca lutein cells	secrete estrogen

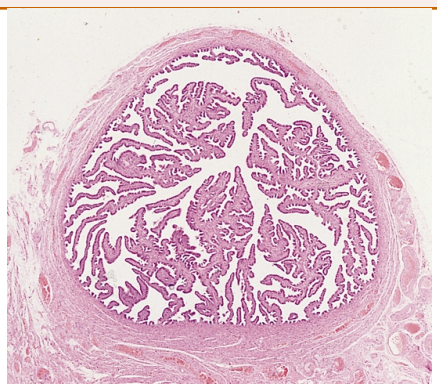
Corpus Albicans

- It is a white degenerated fibrous body formed by involution of Corpus luteum **(degenerated corpus luteum).**
- Secretory cells of corpus luteum degenerate and are **phagocytosed by macrophages.**

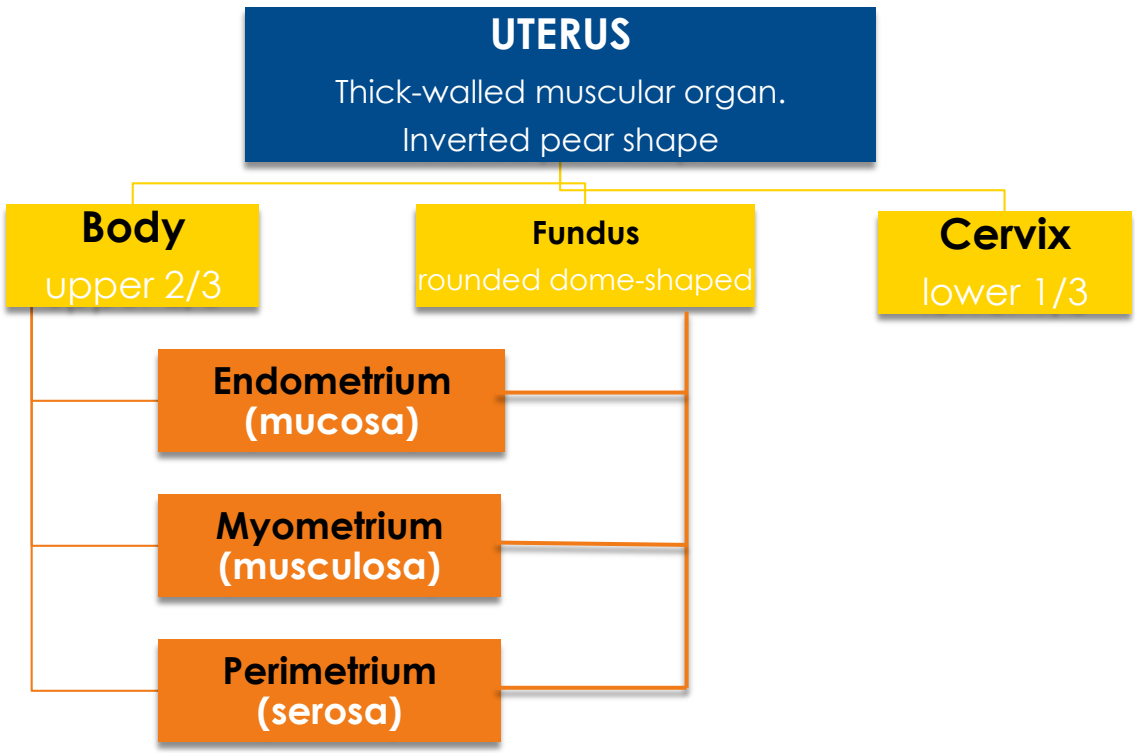
Oviducts (Fallopian Tubes)

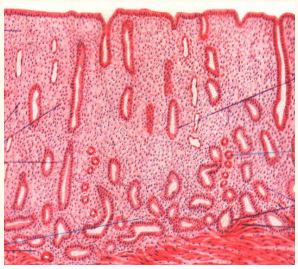
Mucosa:	• Highly folded. • Epithelium: **Simple columnar <u>partially</u> ciliated.** • Corium of C.T.
Musculosa:	• Inner circular. • Outer longitudinal.
Serosa	

1.Ciliated cells	2.Non-ciliated cells
• **Non-secretory.** • Cilia beat toward uterus.	• Thinner, also called **peg cells**. • Secretory cells. • Apices bulge above ciliated cells. • Their **apices contain nutritive material** to nourish gametes.



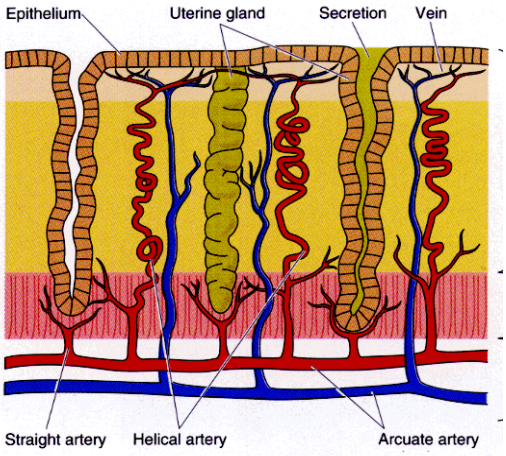
UTERUS



Endometrium	**Epithelium**	**simple columnar partially ciliated.**
	Corium: 	Endometrial glands: **simple tubular.** Stromal cells. Blood vessels. **Leucocytes.** Reticular fibers.

Two types of arteries derived from vessels in the myometrium:

Coiled arteries	Straight arteries
• extend into the **functional zone**. • cyclic changes.	• terminate in **basal zone.** • no cyclic changes.



**The yellow part will detach during Menstruation that's why the Straight arteries end in the red part to prevent it's rupture while it's stretch.*

Myometrium

3 will-defined smooth muscle layers:

Stratum submucosum:

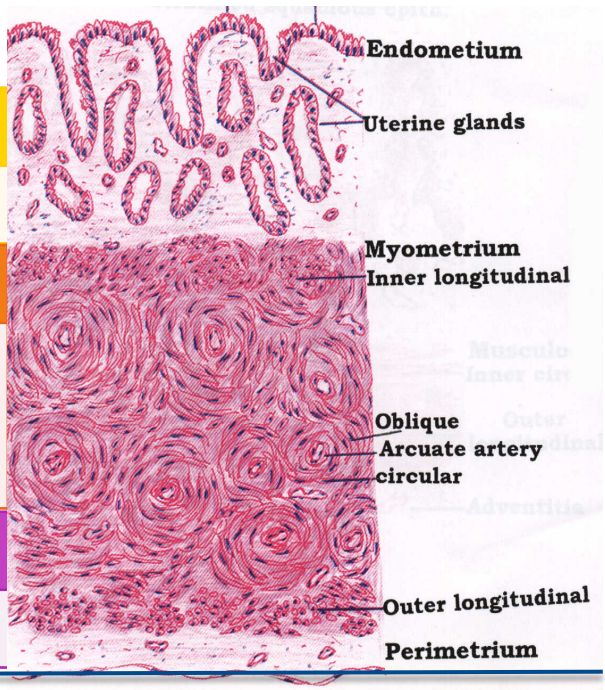
Longitudinal.

Stratum vasculare:

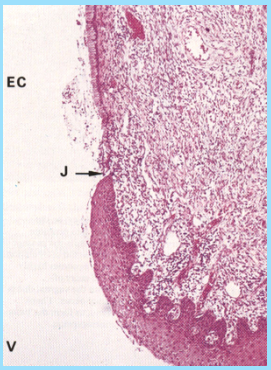
circular smooth muscle fibres in figure of 8 arrangement around large blood vessels.
(when it contracts in menstruation to prevent bleeding lead to stomac hcramp)

Stratum supravasculare:

Longitudinal.

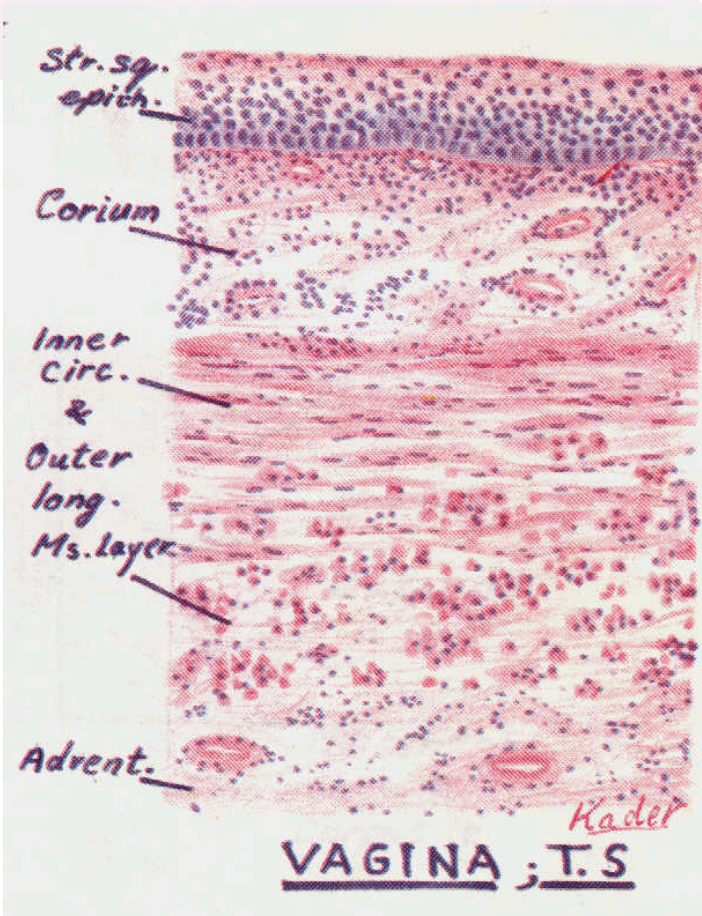


Uterine Cervix

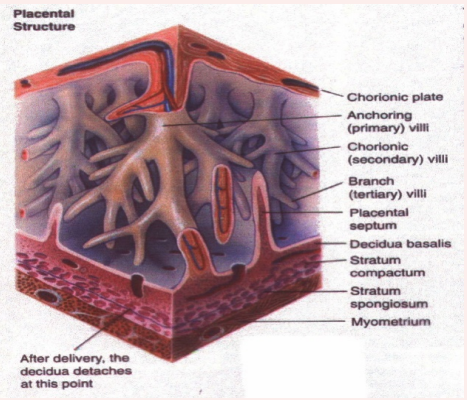
Mucosa: 	Epithelium:	**simple columnar** in the cervical canal, it changes to **stratified squamous epith. (non-keratinized) at the external os.**
	Corium:	CT containing **tubulo-alveolar** glands.
Substance of the cervix	dense fibrous tissue with few smooth muscle fibers.	

VAGINA

Mucosa: shows transverse folds	**<u>Epithelium</u>: stratified squamous epithelium non-keratinized, rich in glycogen.*** **glycogen to feed the bacteria there (normal flora) and prevent any infection.*
	<u>Corium</u>: of dense C.T., very rich in blood vessels, elastic fibres and leucocytes.
Musculosa:	formed of interlacing **inner circular** and **outer longitudinal** layers of smooth muscle fibres.
Adventitia:	formed of loose C.T.



Placenta

Maternal part (decidua basalis)	Foetal part (chorionic villi):
	finger-like projections separated by **intervillous spaces containing maternal blood**. Each chorionic villus consists of:
	**Mesenchymal CT core** containing fetal blood vessels.
	Epithelial covering (**trophoblast)**, made of 2 layers:
	a) Outer syncytiotrophoblast deeply stained with no cell boundaries. **b)Inner cytotrophoblast:** disappears late in pregnancy.

Placental Barrier

1. The **trophoblast** covering the villus.
2. The basement membrane of the trophoblast.
3. The C.T. core of the villus.
4. The basement membrane of foetal capillaries.
5. **The endothelium** of foetal capillaries.

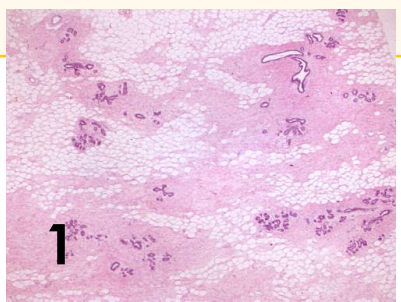
Mammary Gland

- At **puberty** they enlarge by accumulation of fat**, but contain only a duct system.**
- Secretory units **appear** only during pregnancy and are **functioning** only during lactation.

1-Resting Mammary Gland:

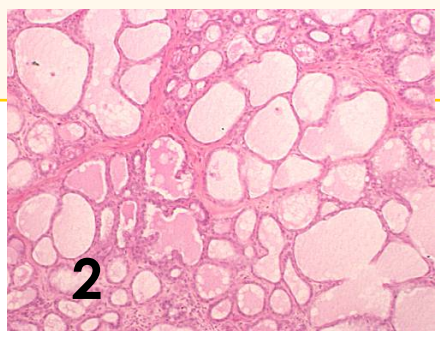
It is divided into lobes and lobules.

- The interlobular C.T. is **dense** and contains numerous fat cells.
- The intralobular C.T. is **loose** and contains no fat cells.
- Within the lobules, there are widely separated ducts lined by **simple cuboidal epithelium.**
- Ducts collect to form lactiferous ducts lined by **stratified columnar epithelium** and open at the top of the nipple.



2-Lactating Mammary Gland:

- Interlobular and intralobular C.T. become **reduced.**
- Lobules are made of ducts and alveoli.
- Alveoli are distended with milk and lined by **cuboidal** or **flat** cells surrounded by myoepithelial cells.
- Milk appears acidophilic with vacuoles of dissolved fat.



MCQ ..

1- **theca lutein** cells secrete :

A- estrogen

B- progestron

C- inhibin

D- FSH

2- Which of the following will **disappear in pregnancy** :

A- Outer syncytiotrophoblast.

B- Inner cytotrophoblast.

C- trophoblast.

3-which of the followings Corium's contain **tubulo-alveolar glands** :

A- vagina.

B- body of uterus.

C- Uterine Cervix.

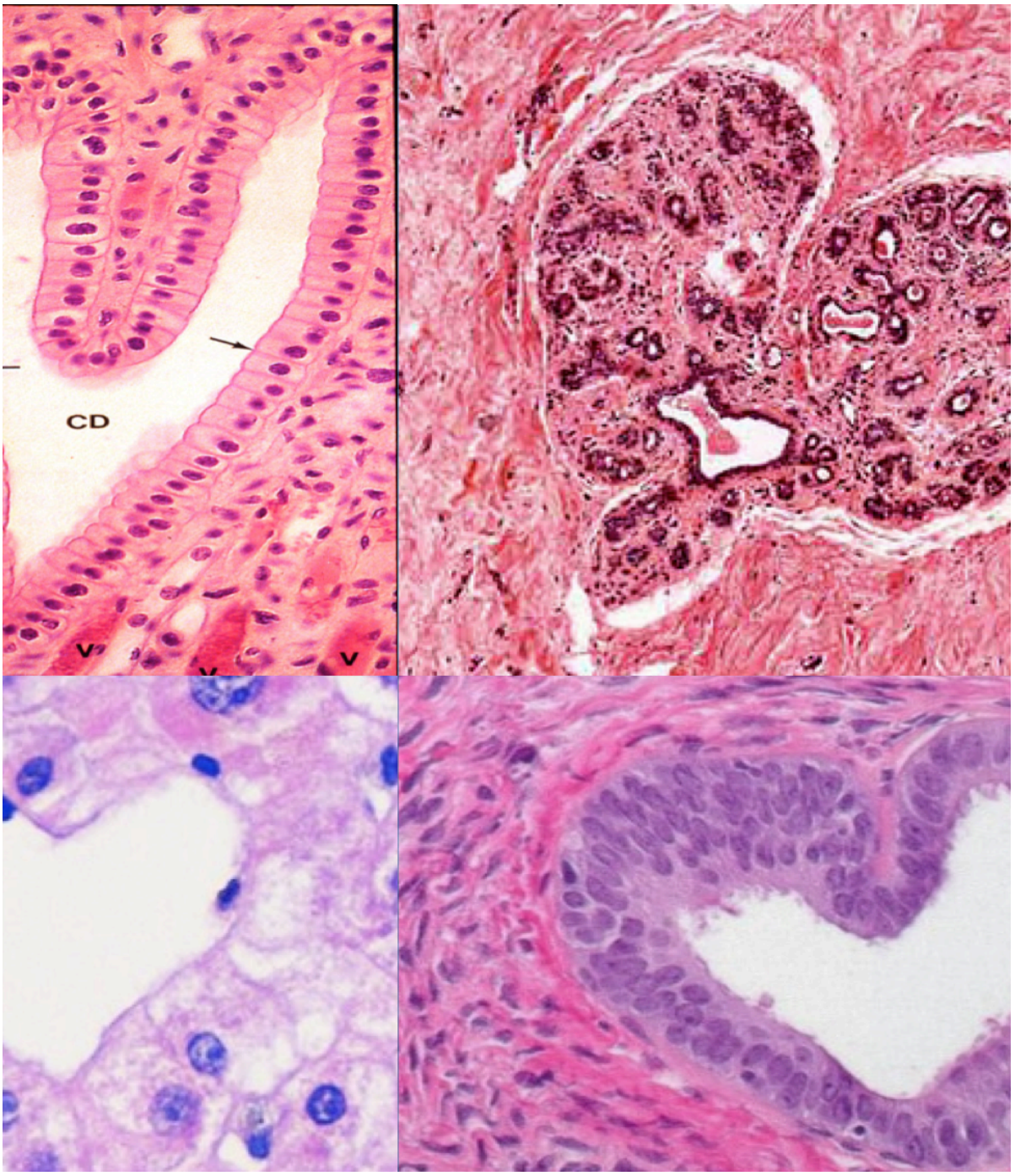
4- Corpus luteum of **menstruation** last for :

A – 7 months

B – 6 months

C- 10 days.

1-A 2-B 3-C 4-C



We hope that we made histology easier for you..

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