

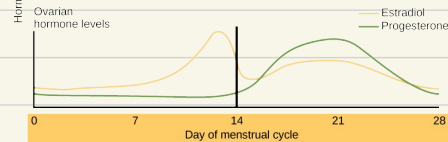
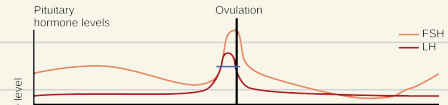
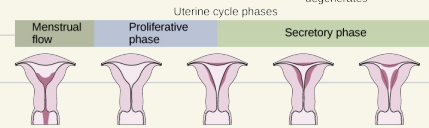
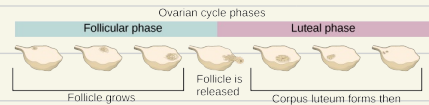
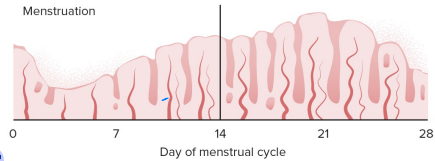
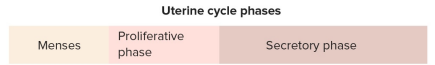
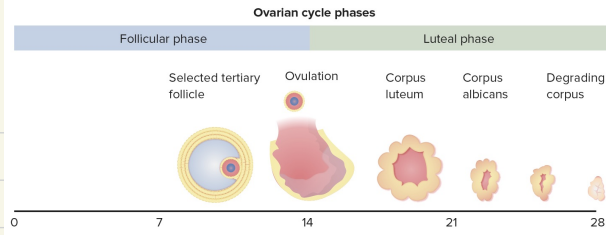
Ovarian and uterine cycle

ovarian cycle

Periodic changes occur in ovary every lunar month (28 days) during fertile period of the non pregnant female after puberty

The ovarian cycle is divided into 3 phases

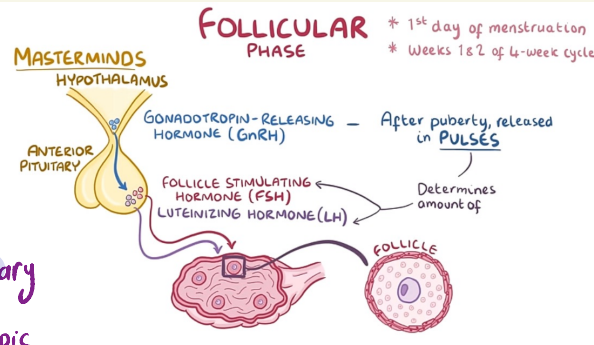
- 1- Preovulatory (follicular) phase
- 2- Ovulation
- 3- Post ovulatory (luteal) phase



Hormonal Control

Hypothalamus secretes (GnRH)
"gonadotropin releasing hormone"

GnRH → Stimulate anterior lobe of pituitary gland
→ Secrete two gonadotropic hormones (FSH, LH)



1) Follicle stimulating hormone (FSH) → acts in the first stage of ovarian cycle

* it includes maturation of primary follicle into graafian follicle

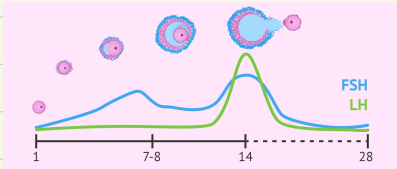
* induces follicular cells to secrete estrogen

2. Lutenising Hormone (LH) → acts mainly at second stage of ovarian cycle

* includes final maturation of graafian follicle and ovulation

* conversion of ruptured follicle into a corpus luteum

* induces corpus luteum to secrete progesterone



Ovarian Cycle Phases

View of ovary

Follicular phase

Luteal phase



Follicle grows

Follicle is released, ovulation

Corpus luteum forms then degenerates

View of follicle/
corpus luteum



0 7 14 21 28
Day of menstrual cycle

I. Preovulatory (Follicular phase)

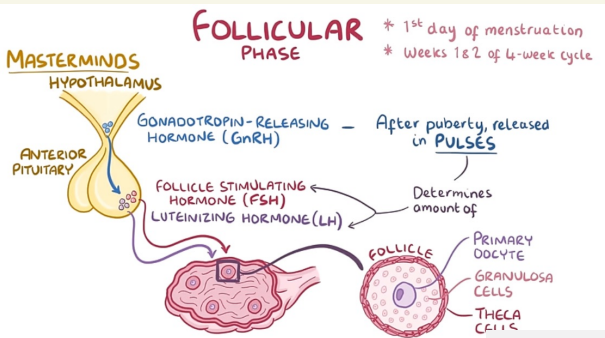
"1st half of the cycle"

→ the estrogen released in this phase is responsible for the proliferative phase of cycle

* at the beginning of each ovarian cycle, the anterior lobe of pituitary gland secretes FSH which stimulates a number of primordial follicles to develop

* only one follicle reaches maturity and secretes estrogen which inhibits secretion of FSH by pituitary gland

* Estrogen stimulates secretion of LH leading to degeneration of remaining follicles → atretic follicles



II. Ovulation

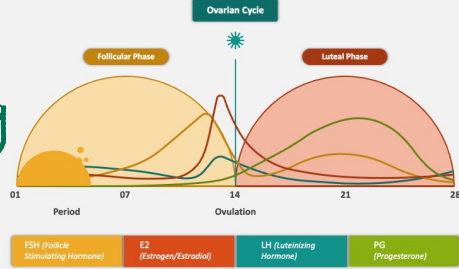
Luteinizing hormone (LH)

① Stimulates collagenase activity resulting in digestion of collagen fibers surrounding mature graafian follicle

② increase prostaglandin activity resulting in ovarian contraction

* Rupture of mature graafian follicle → release of secondary oocyte together with corona radiata and zona pellucida

OVARIAN CYCLE



III. Post ovulatory (luteal) phase

after ovulation under effect of LH, the cells of membrana granulosa and theca interna are changed into corpus luteum

Corpus luteum secrete progesterone hormone res possible for secretory phase of uterine cycle + inhibit LH



State of corpus luteum

A - Fertilization does not occur

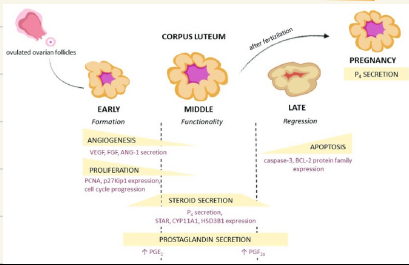
Corpus luteum degenerates, after 9 days from ovulation and becomes a fibrous body \rightsquigarrow **Corpus albicans**

degeneration of corpus luteum leads to decrease progesterone level in blood

B - Fertilization occurs

Corpus luteum of pregnancy (which is maintained till the 4th month of pregnancy)

by HCG \rightarrow Human chorionic gonadotropin hormone



uterine (menstrual) cycle

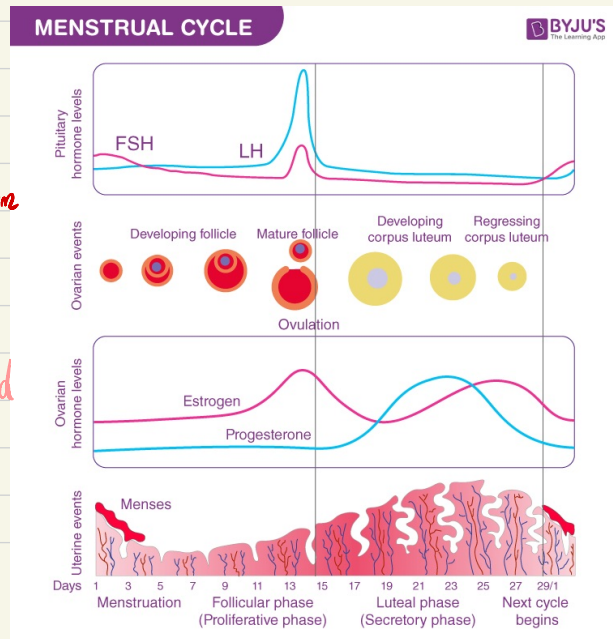
periodic changes which occurs in endometrium (mucous membrane of uterus) every 28 days during fertile period of non pregnant female

* it is affected by the ovarian cycle and ovarian hormones

I. Menstrual phase

II. Proliferative (estrogen or postmenstrual)

III. Secretory (premenstrual or progestational) phase

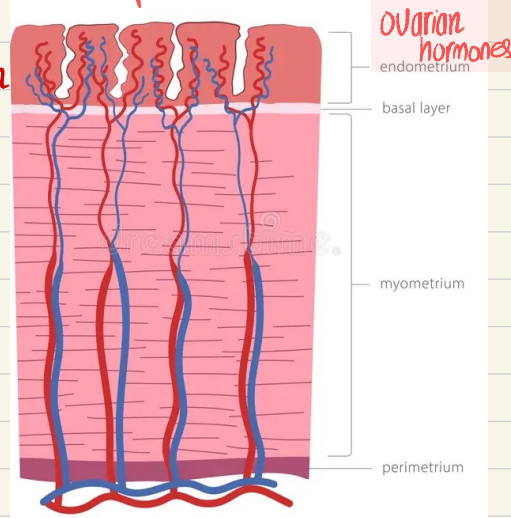


The uterine wall has 3 layers and uterine cycle has 3 phases under effect of

1. **Perimetrium**: a layer of peritoneum, which covers the external aspect of the uterus

2. **Myometrium**: a thick layer of smooth muscles fibers

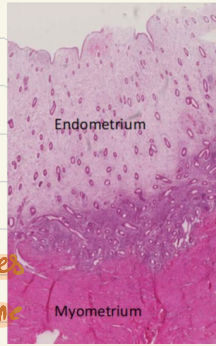
3. **Endometrium**: inner mucosa of uterus



During secretory phase of the menstrual cycle the endometrium itself is formed of

1. **Stratum functionalis**

2. **Stratum basalis**

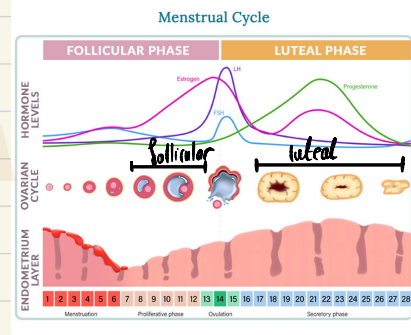


Stratum functionalis

Stratum basalis

Supplied by long spiral arteries which is dilated by progesterone

Functional layer shed at menstruation



Basal layer → Supplied by its own short straight arteries and it does not shed during menstruation

* Forms regenerative layer of endometrium which is responsible for reformation of uterine glands after menstruation

Menstrual Cycle

I. Menstrual phase : (3-5 days)

* Corresponds to preovulatory phase of ovarian cycle

(Cause: decrease progesterone & estrogen level to less extent (at the end of previous luteal phase) leading to constriction of spiral arteries supplying superficial part of endometrium)

Superficial part of endometrium degenerates and expelled with mucous and unclotted blood (due to proteolytic enzymes) from ulcerated uterus

* at the end of this phase, endometrium is reduced in thickness *
* basal layer of endometrium is not affected *

II. Proliferative (estrogenic or postmenstrual phase) : (10 days)

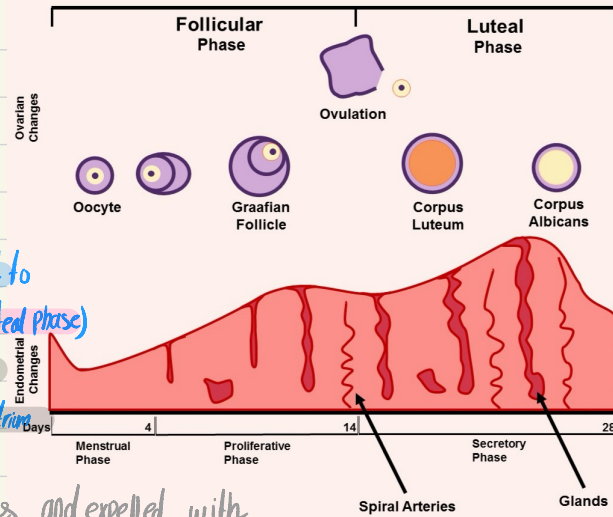
Corresponds to last 10 days of pre-ovulation of ovarian cycle under effect of estrogen secreted by developing follicle

* endometrium gradually thickens; its blood supply increase and mucous gland enlarge
* There is a gradual regeneration and repair of endometrial glands and their spiral arteries

III. Secretory (Premenstrual or Progestational phase) : last 14 days

* Corresponds to postovulation of ovarian cycle
* under effect of progesterone (from corpus luteum) and estrogen to less extent
* arteries become spiral and mucous glands becomes long, tortuous + distended with secretion

* These changes in endometrium can be regarded as preparation of endometrium for reception and nourishment of suspected blastocyst if fertilization occur



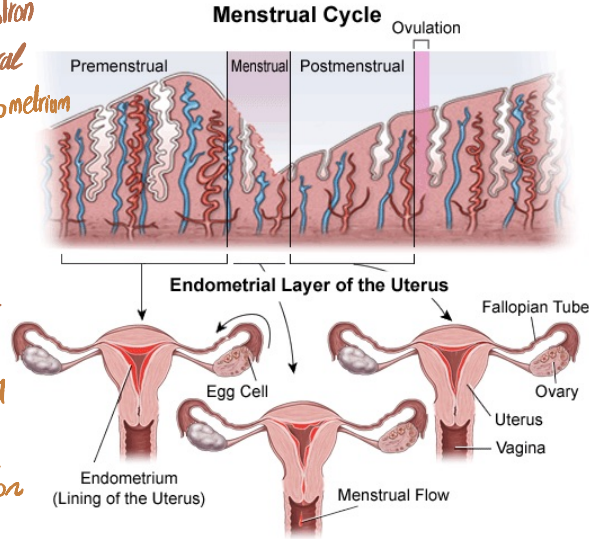
وَأَنْ لَيْسَ لِلْإِنْسَانِ إِلَّا مَا سَعَى ﴿٣٩﴾
 وَأَنْ سَعْيُهُمْ لَشَوْفٍ لَرِيءٍ ﴿٤٠﴾
 فَذُوقُوا الْعَذَابَ بِالْجِزَاءِ الَّتِي كُنتُمْ تَعْمَلُونَ ﴿٤١﴾

if fertilization does not occur

Corpus luteum degenerates with drop in progesteron hormone leads to → Vasoconstriction of spiral arteries → ischemia of functional layer of endometrium followed by its shedding with bleeding

if fertilization occurs → Corpus luteum of pregnancy and continues to secrete progesterone

now the endometrium is transformed into decidua of pregnancy → receive the blastocyst, which reaches uterine cavity 6 days after fertilization



The decidua has three parts

1- decidua basalis : between fetus and myometrium it will form maternal part of placenta

2- decidua capsularis : covers rest of fetus

3- decidua parietalis : lines uterine cavity

