

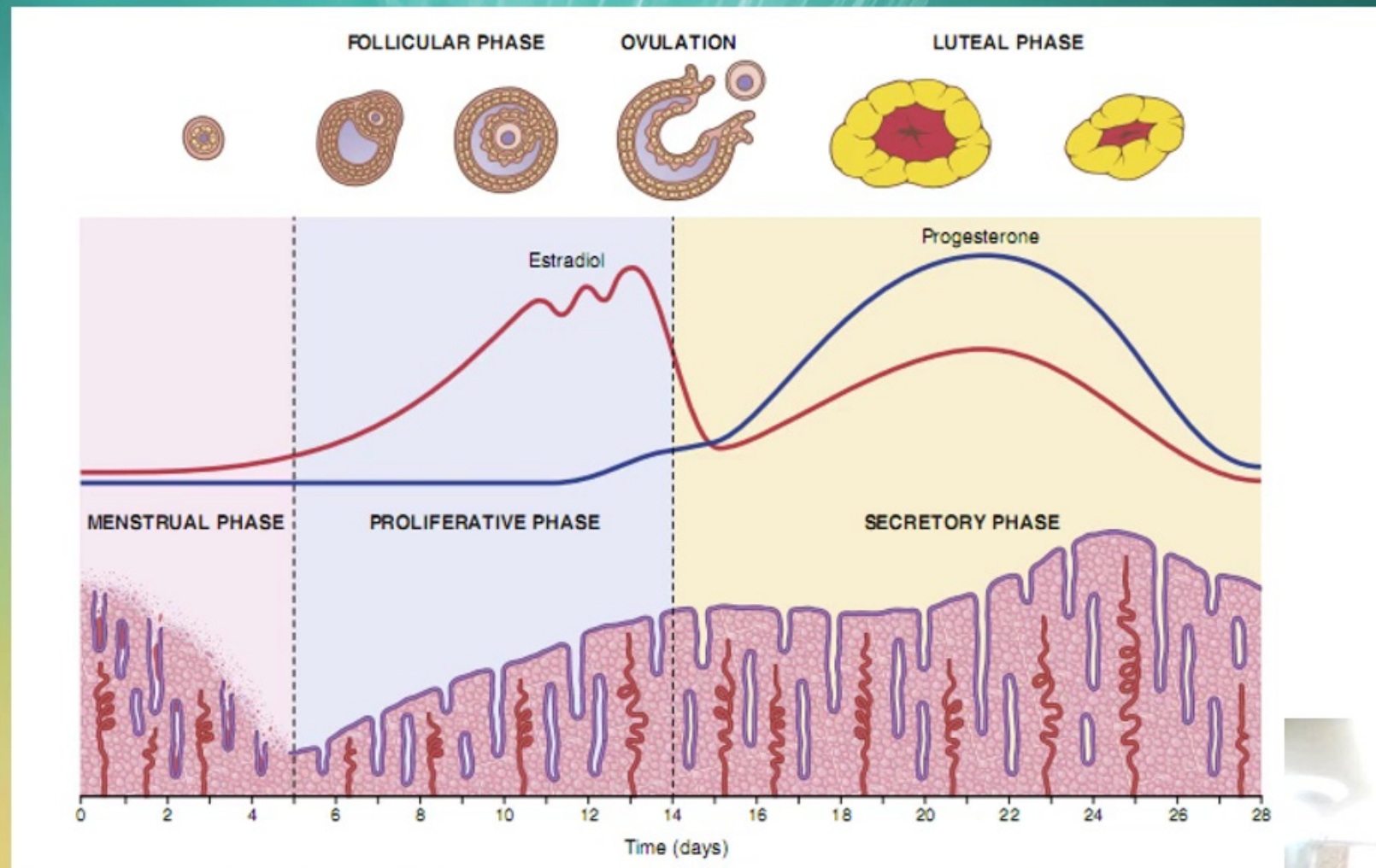


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Female reproductive system v







Endometrial Proliferative Phase

- The Endometrial Proliferative Phase Is Initiated by Secretion of Estrogen From the Developing Follicles.
- At the beginning of each cycle, most of the endometrium has been lost during menstruation, and only a thin layer of basal endometrial stroma remains.
- The only remaining epithelial cells are located in the crypts of the endometrium and in the deep portions of the endometrial glands.





Endometrial Proliferative Phase

- Estrogen secreted from developing follicles during the early portion of the cycle stimulates rapid proliferation of stromal and epithelial cells.
- The entire endometrial surface is re-epithelialized within 4 to 7 days of the beginning of menstruation.
- During the next 10 days, the stimulatory effects of estrogen cause development and thickening of the endometrium of up to 4 millimeters

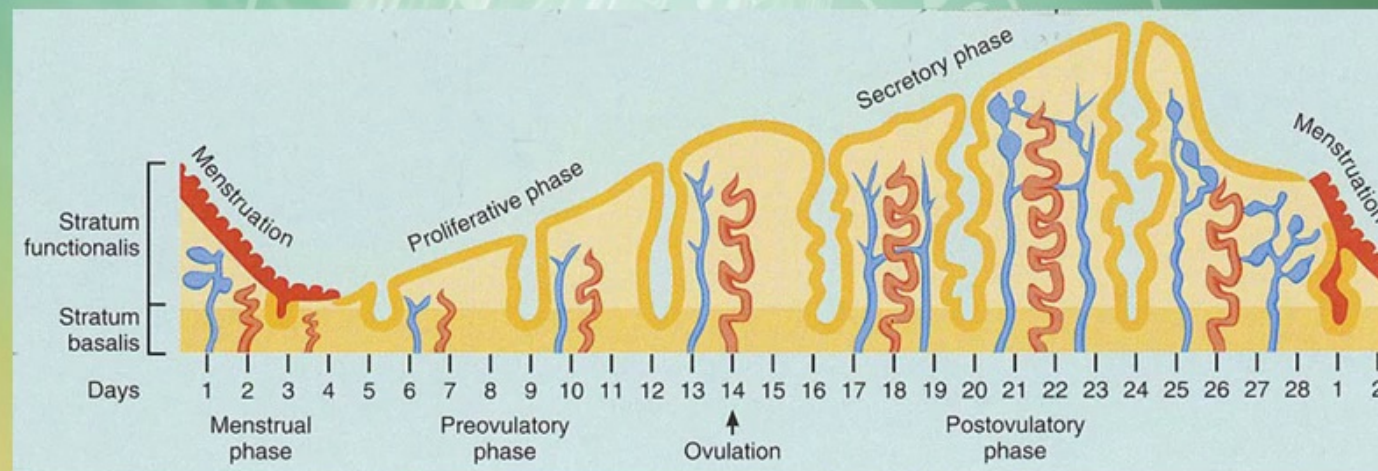




Endometrial Secretory Phase

- The Endometrial Secretory Phase Results From Changes Brought About by Progesterone. After ovulation, the corpus luteum secretes large amounts of progesterone and estrogen.
- The effect of progesterone is to cause swelling and secretory development of the endometrium.
- The glands secrete fluid, and endometrial cells accumulate lipids and glycogen in their cytoplasm.
- The vascularity of the endometrium continues to develop in response to the requirements of the developing tissue. At the peak of the secretory phase, at 1 week after ovulation, the endometrium is approximately 6 millimeters thick.







Menstruation

- Menstruation Follows Within 2 Days of Involution of the Corpus Luteum.
- Without the stimulation of the estrogen and progesterone secreted by the corpus luteum, the endometrium rapidly involutes to about 65 percent of its previous thickness.
- Then, starting approximately 24 hours before menstruation, the blood vessels supplying the endometrium become vasospastic, resulting in ischemia and finally necrosis of the tissue.





Menstruation

- Hemorrhagic areas develop in the necrotic tissue, and gradually the outer layers separate from the uterine wall. At about 48 hours after the start of menstruation, all the superficial layers of the endometrium are desquamated.
- Distention of the uterine cavity, elevated levels of prostaglandin E2 released from the ischemic and necrotic tissue, and low levels of progesterone contribute to stimulation of uterine contractions, which expel the shed tissue and blood.
- The menstrual fluid is normally nonclotting because of the presence of fibrinolysis, which is released from the endometrial tissue.





REGULATION OF THE FEMALE MONTHLY

- At the beginning of each monthly cycle, a new group of primary follicles begins to develop, secreting increasing levels of estrogen in response to the trophic hormones from the pituitary, FSH, and LH.
- Estrogen in small amounts strongly inhibits secretion of LH and FSH through a direct pituitary effect, although estrogen also inhibits the hypothalamic secretion of GnRH.
- Progesterone acts synergistically with estrogen, but it has only a weak inhibitory effect by itself.





REGULATION OF THE FEMALE MONTHLY

- As the level of estrogen rises, the rate of secretion of the pituitary hormones begins to fall; however, for unknown reasons, the pituitary gland secretes a large amount of LH immediately before ovulation, when estrogen levels are elevated.
- This surge of LH at a time when LH secretion “should” be suppressed by the inhibitory influence of estrogen triggers ovulation and transformation of the granulosa and thecal cells to luteal cells.





REGULATION OF THE FEMALE MONTHLY

- After ovulation, the estrogen and progesterone secreted from the corpus luteum again exert an inhibitory effect on the secretion of LH and FSH.
- Inhibin also is secreted from the corpus luteum. As in males, inhibin in females inhibits secretion of FSH and, to a lesser extent, LH.

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REGULATION OF THE FEMALE MONTHLY

- Once the levels of LH fall to minimal values because of the inhibitory influence of the hormones from the corpus luteum, the corpus luteum involutes, and estrogen and progesterone secretion rates decline toward zero.
- Formation of LH and FSH increases in the absence of inhibition as menstruation begins, initiating the development of a new group of follicles.

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Summary of Ovarian and Menstrual Cycles

