

Menstrual Cycle

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The Four Key Hormones

FSH (Follicle Stimulating Hormone):
Stimulates follicle development.

LH (Luteinizing Hormone): Triggers
ovulation.

Estrogen: Prepares endometrium and
stimulates secondary sex characteristics.

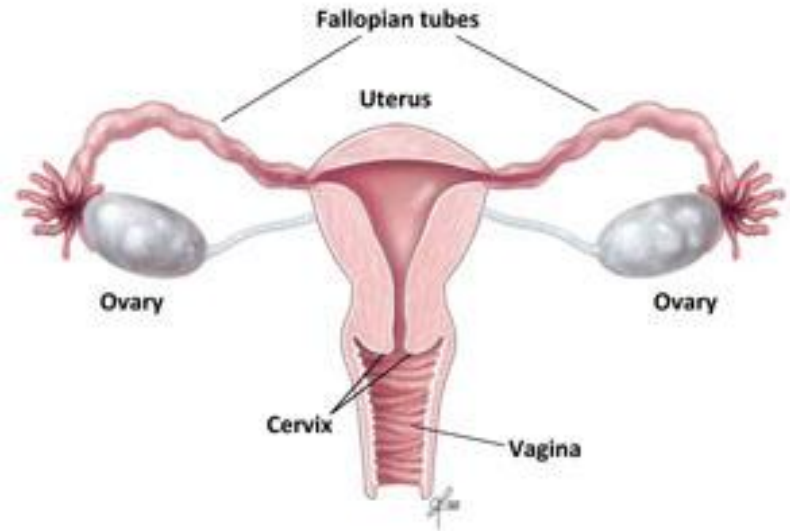
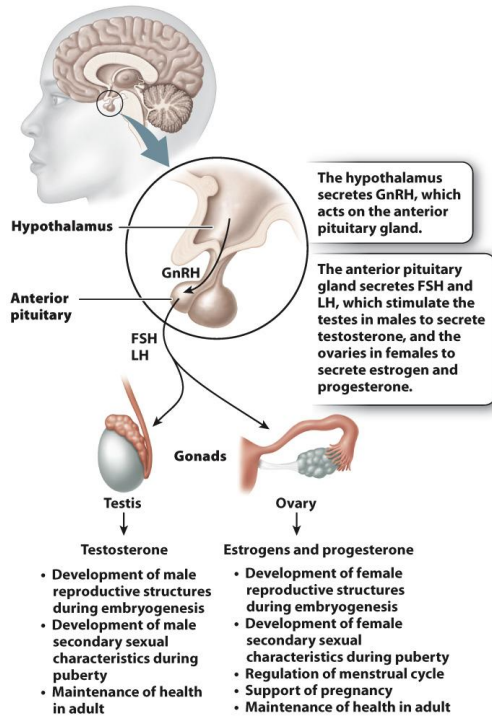
Progesterone: Maintains endometrium.

Phases of the Menstrual Cycle

Follicular Phase (Day 1–14):
Follicle develops, and Estrogen
levels rise.

Luteal Phase (Day 15–28):
Ovulation and Corpus luteum
forms and secretes progesterone.

Luteal phase = Always 14 days,
regardless of cycle length.



Key Structures Involved

Brain:

- *Hypothalamus*: GnRH (Gonadotrophin Releasing Hormone)
- *Anterior Pituitary*: FSH, LH

Pelvic Organs:

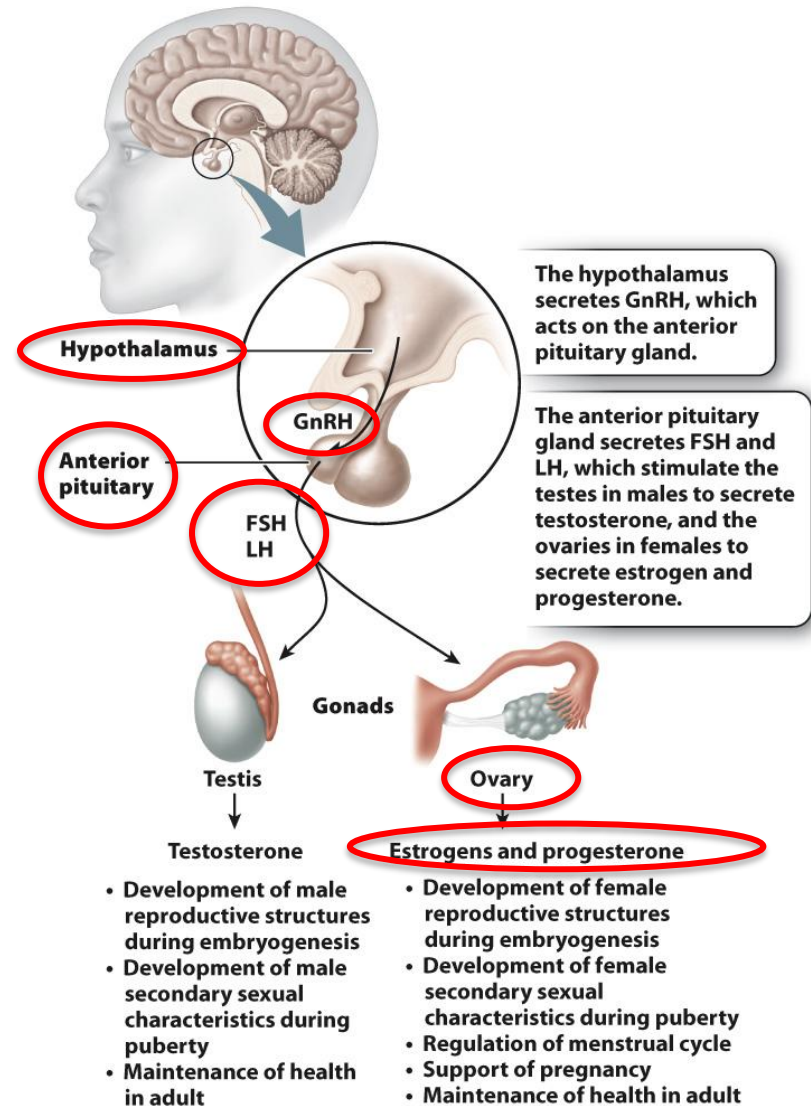
- *Vagina, Uterus, Cervix, Fallopian Tubes, Ovaries*

Cycle Day 1: The Start

Hypothalamus → *GnRH*
(Gonadotrophin Releasing Hormone) → *FSH* & *LH* release

FSH → stimulates development of 15–20 follicles

Follicles → Secrete **estrogen**.



Role of Estrogen

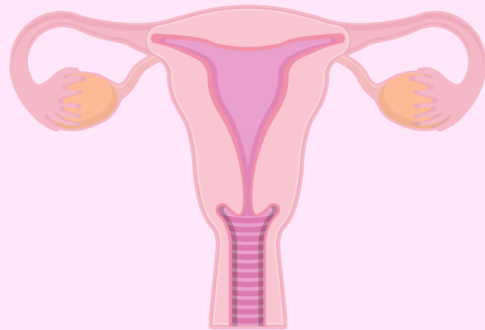
Promotes secondary sex characteristics (breast tissue, vulva, vagina, and uterus)

Endometrial thickening.

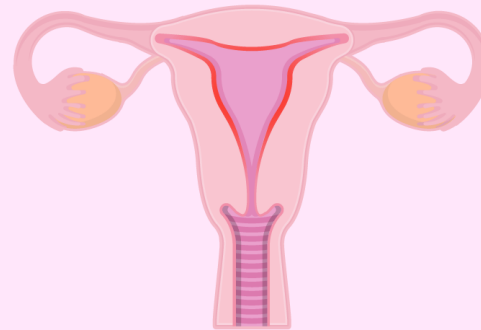
Cervical mucus thinning for sperm penetration.

Negative feedback:
High Estrogen initially suppresses FSH & LH

Endometrial thickening

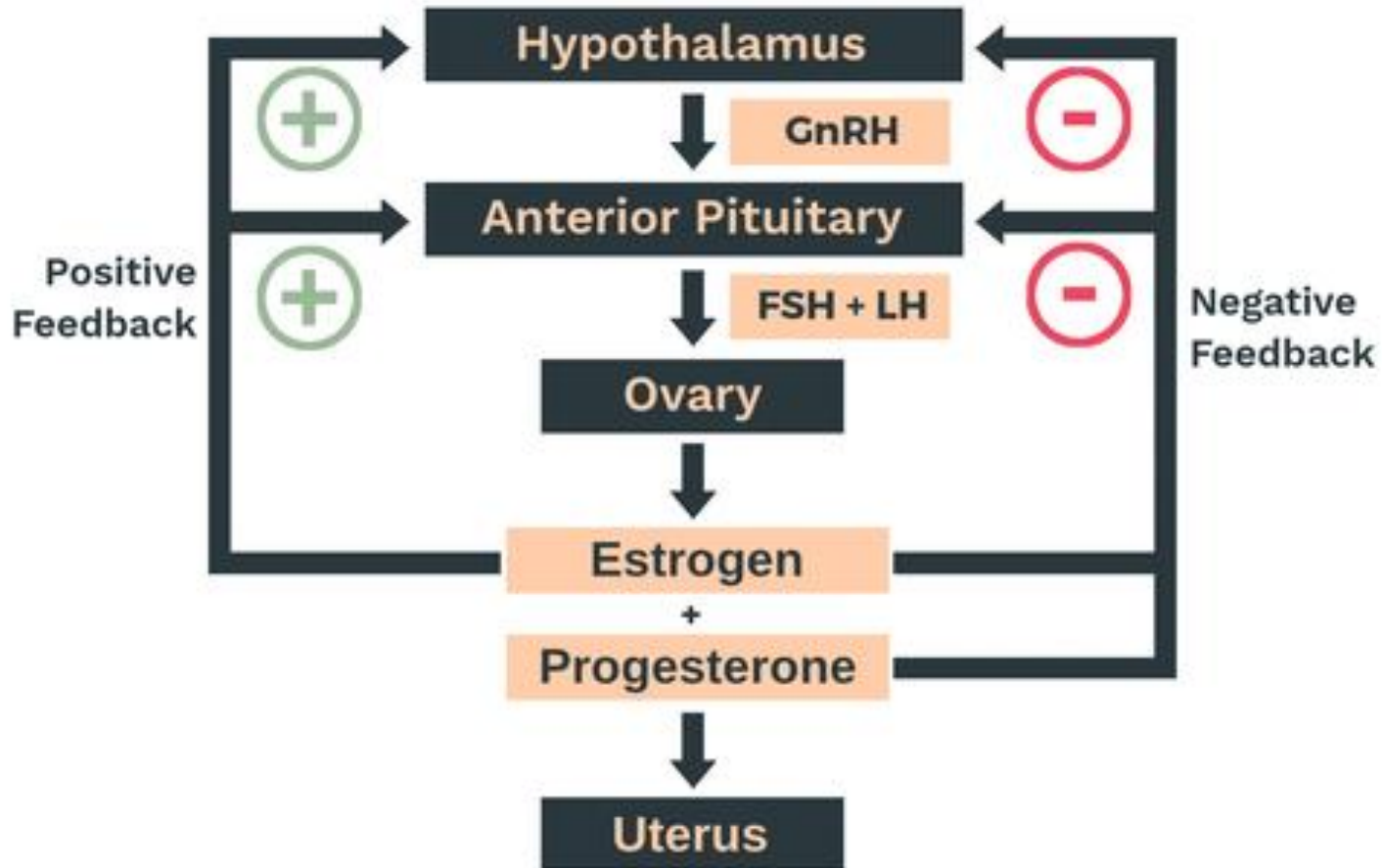


Normal
Endometrium



Thickened
endometrium

Estrogen – Negative Feedback

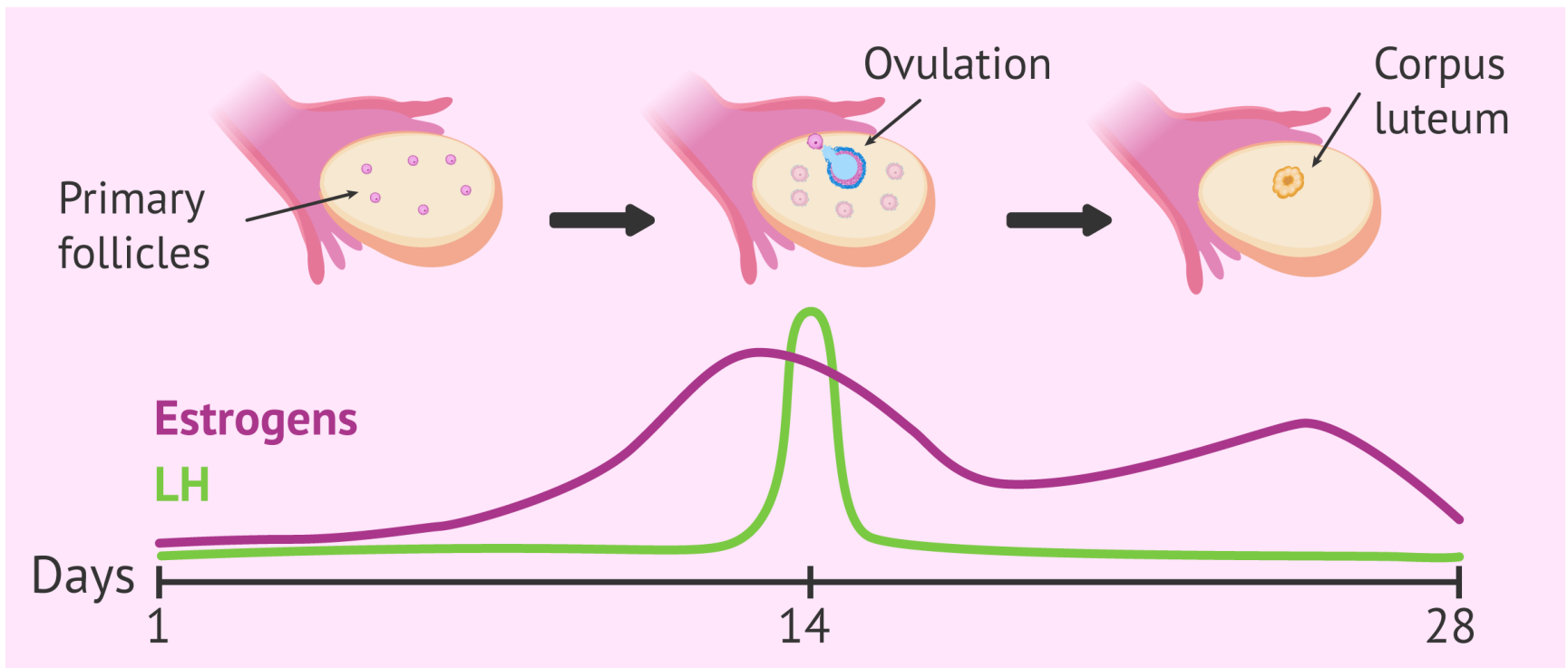


Ovulation (Day 14)

Estrogen dips → **LH surge**

LH surge → Ovum (egg) released from dominant follicle

Ovulation (releasing of the egg) marks the start of the **luteal phase**



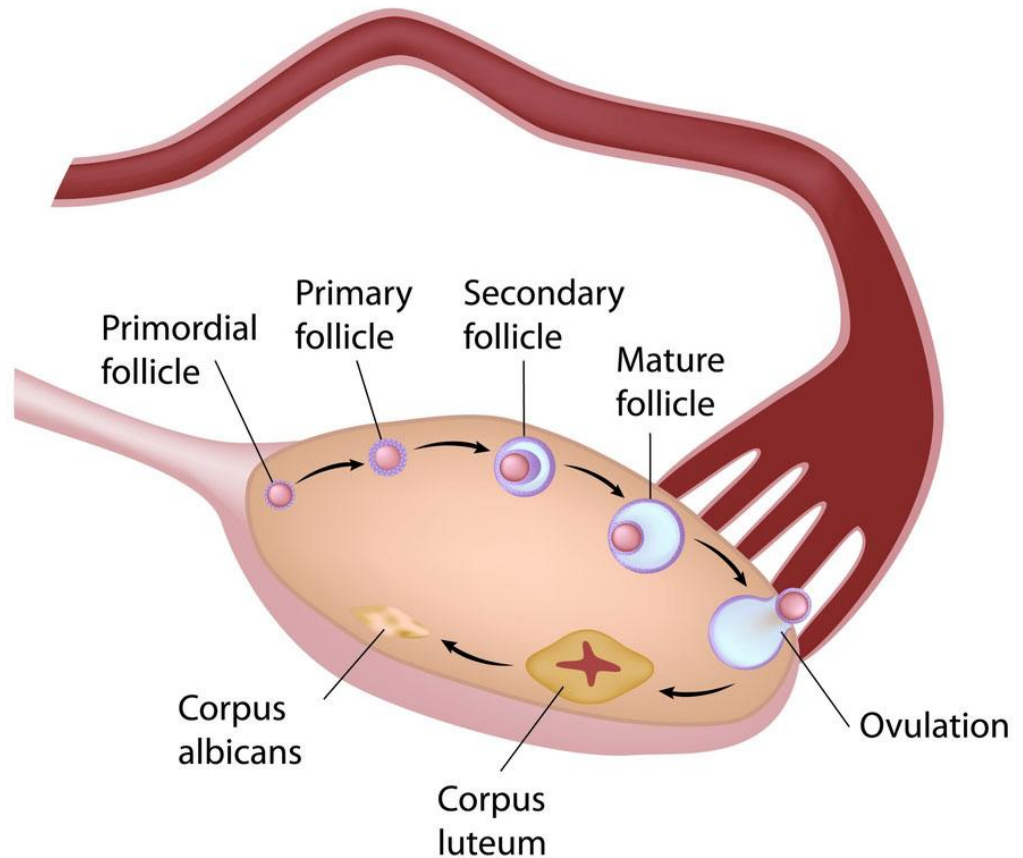
The Luteal Phase

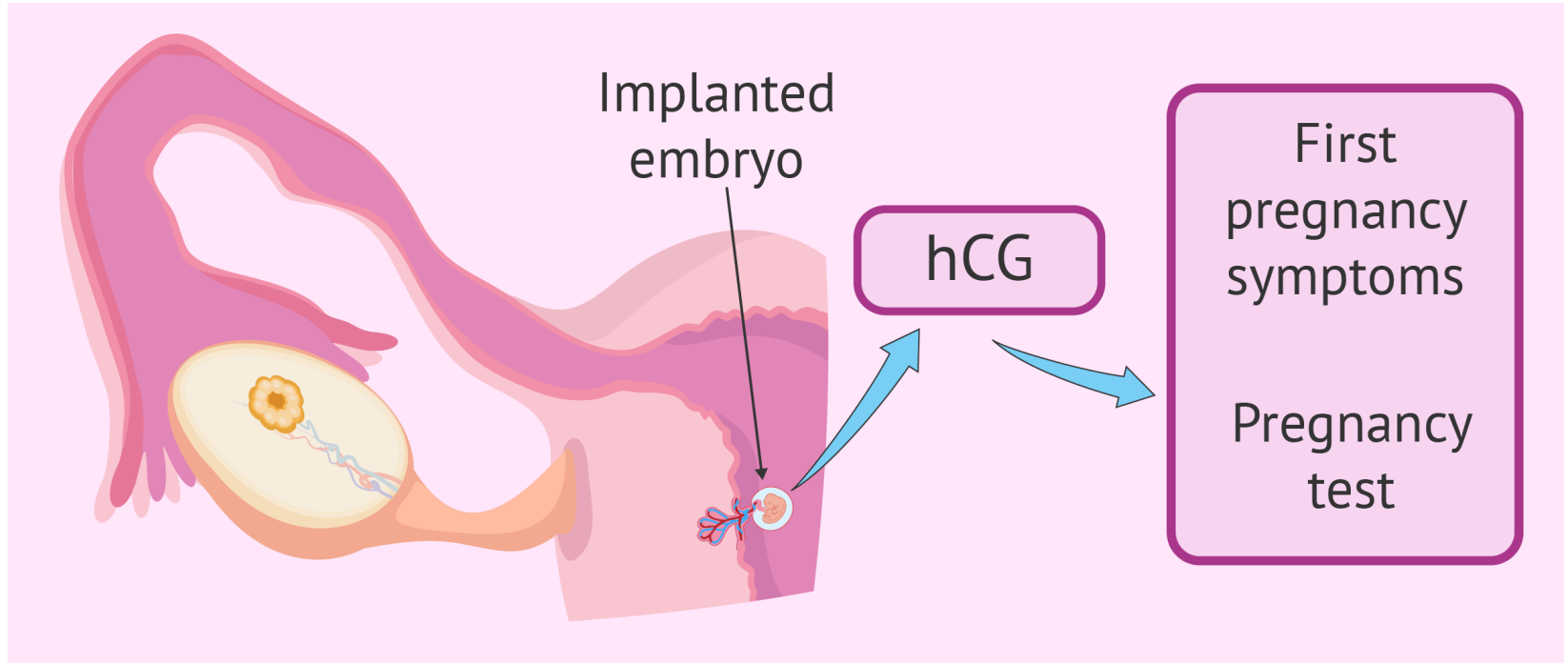
Corpus luteum forms from *collapsed follicle*.

Secretes **progesterone** and some **estrogen**.

Function of progesterone:

- Maintains endometrium.
- Thickens cervical mucus.
- Raises body temperature



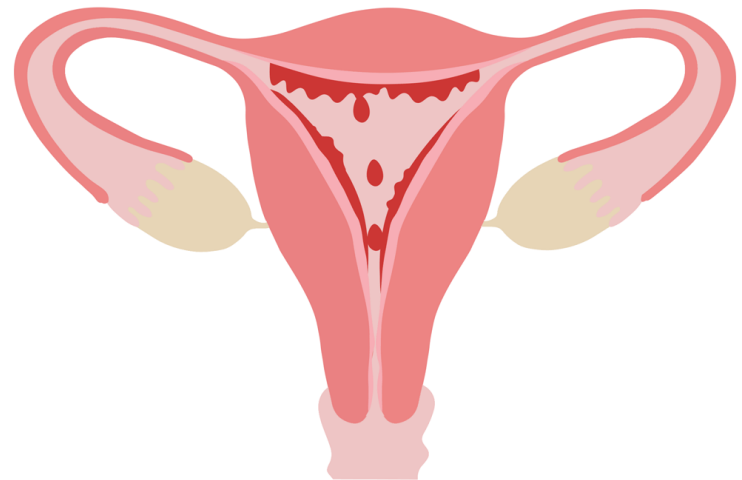


If Fertilization Occurs

- Embryo → secretes **hCG (Human Chorionic Gonadotropin)**; this is the lab test for pregnancy → Maintains *corpus luteum*.
- **Progesterone** secreted by corpus luteum, continues, supporting **pregnancy**.

If Fertilization Does Not Occur

- Corpus luteum degenerates
- Drop in **progesterone & estrogen.**
- **Endometrium sheds** → Bleeding -> Menstruation
- **FSH rises** → New cycle



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Summary of Hormone Changes

FSH: Rises at start

LH: Spike at ovulation

Estrogen: Rise before ovulation, small luteal rise

Progesterone: High after ovulation

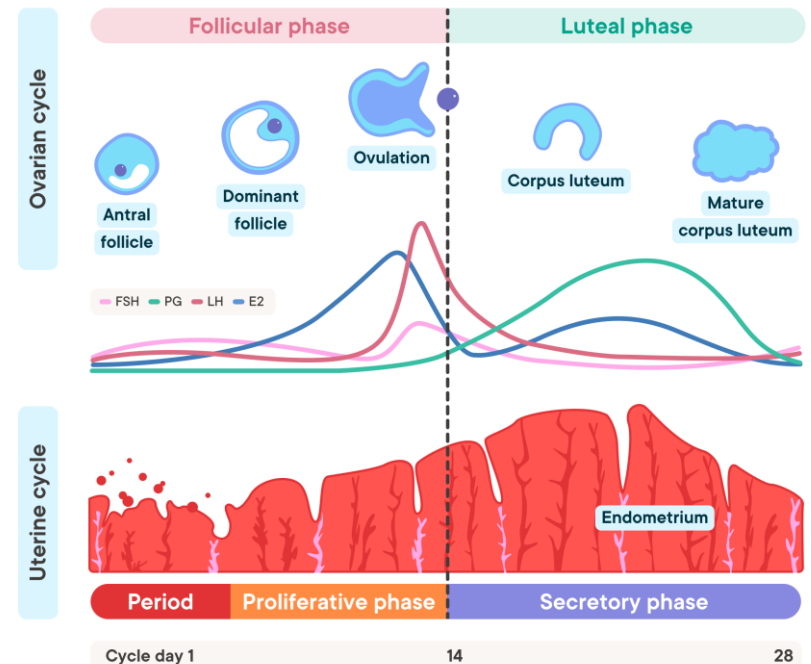


Figure adapted from Critchley HOD, Maybin JA, Armstrong GM, Williams ARW. Physiology of the Endometrium and Regulation of Menstruation. Physiological Reviews. 2020 Jul;100(3):1149-79.

Summary of Hormone Changes

Hormone	Pattern
FSH	Rises at cycle start, small spike before ovulation
LH	Sharp spike triggers ovulation
Estrogen	Rises before ovulation, dips, slight rise in luteal phase
Progesterone	Low until after ovulation, then rises, falls if no pregnancy

Final Recap

Hypothalamus: GnRH

Anterior Pituitary: FSH & LH

Follicles: Estrogen

Corpus Luteum: Progesterone & Estrogen

Embryo: hCG

A decorative element on the left side of the slide consisting of four vertical bars of varying heights and widths, colored in a dark purple or indigo hue.

Wisdom in Nature

- "The menstrual cycle is a monthly symphony of precision, balance, and renewal — a perfect example of nature's wisdom in orchestrating life."
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Everything about Menstrual Cycle

- <https://www.youtube.com/watch?v=3Lt9I5LrWZw&t=1s>