

Menstrual Cycle

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 Year 2014-15

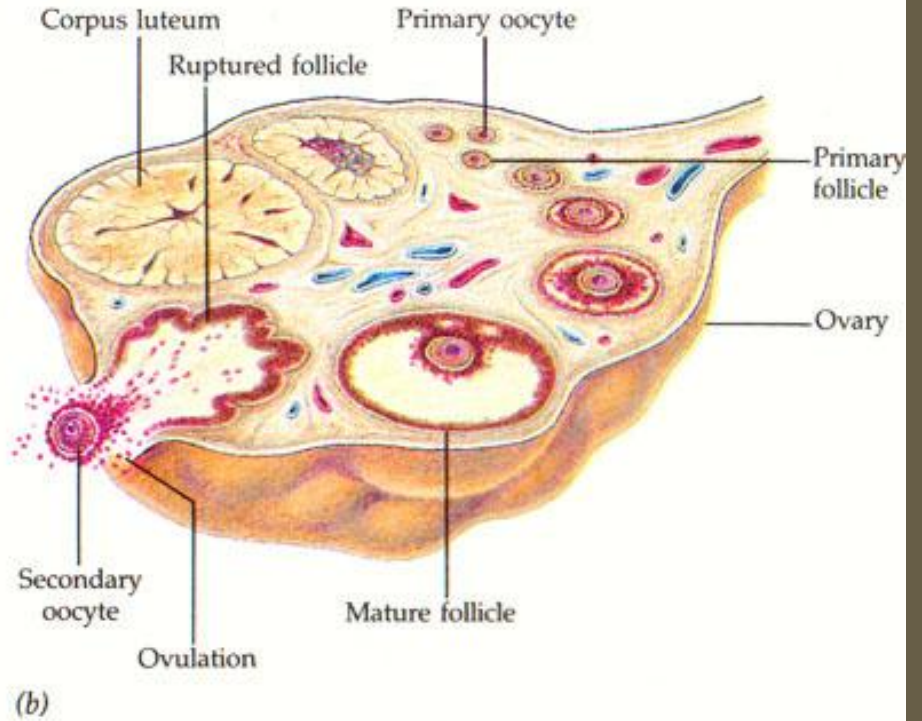
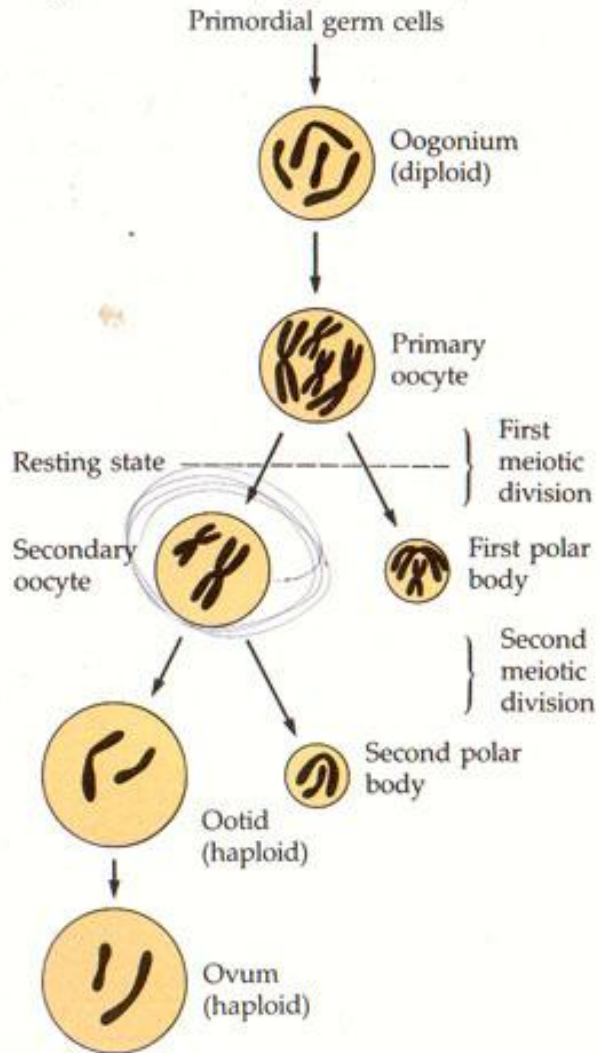
Biology and the Menstrual Cycle

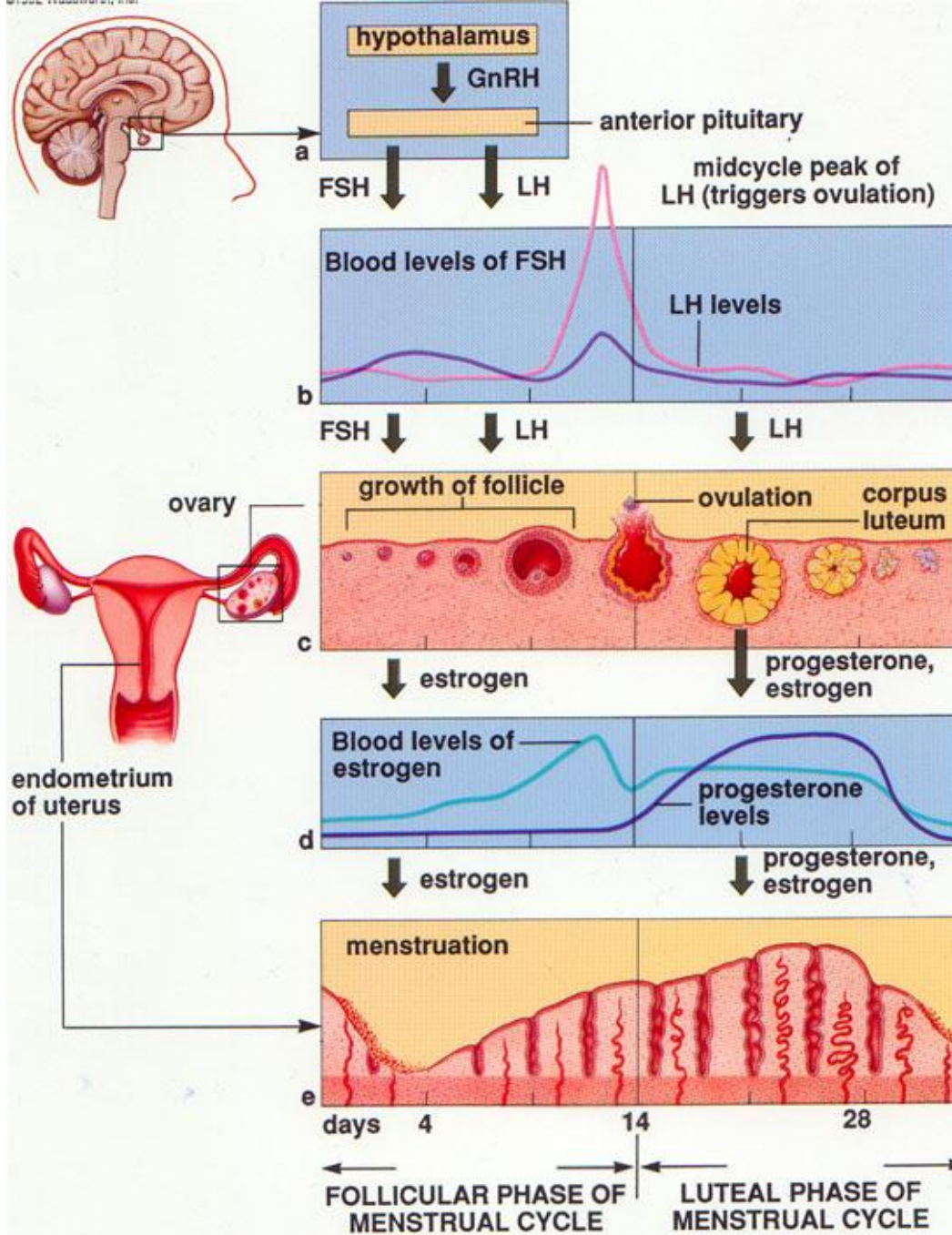
- Menstrual cycle is regulated by fluctuating levels of sex hormones
- These hormones produce certain changes in the ovaries and uterus
- Humans are nearly unique among species in having a menstrual cycle
- Other species of mammals have *estrous cycles*

Basic terms

- Endometrium: Lining of the uterus
- Oocyte: Developing reproductive cell
- Ovum: Mature egg after meiosis
- Menopause: Last menstrual cycle, after which egg production stops

Oogenesis (Figure 42.14)





Changing hormone levels during the menstrual cycle.

4 phases of menstrual cycle

- Menstrual flow
- Proliferative
- Ovulation
- Luteal

During which days of the cycle is FSH at its lowest?

- FSH: follicle stimulating hormones is at its lowest during the last days of the cycle

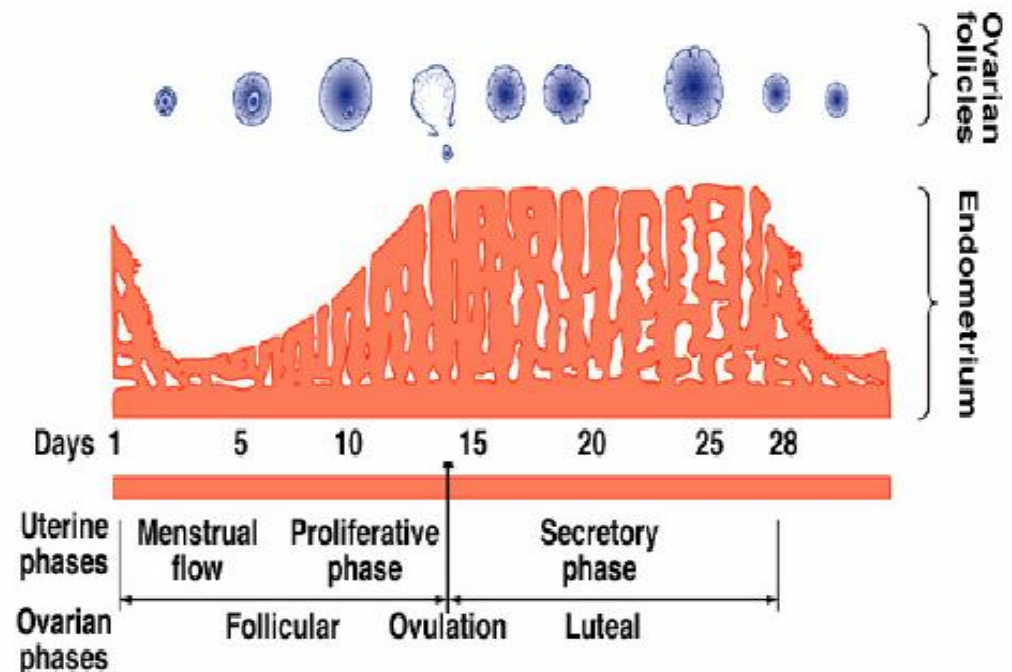
When FSH levels are low what is the size of the follicle

- It is shrinking and disappearing while a new set is growing

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The Biological Events of Menstrual Cycle

(c) Changes in ovarian follicles and uterine endometrium



- What is happening to estrogen during the follicle phase?
- It dips then rises
- In response the uterus lining dips then rises

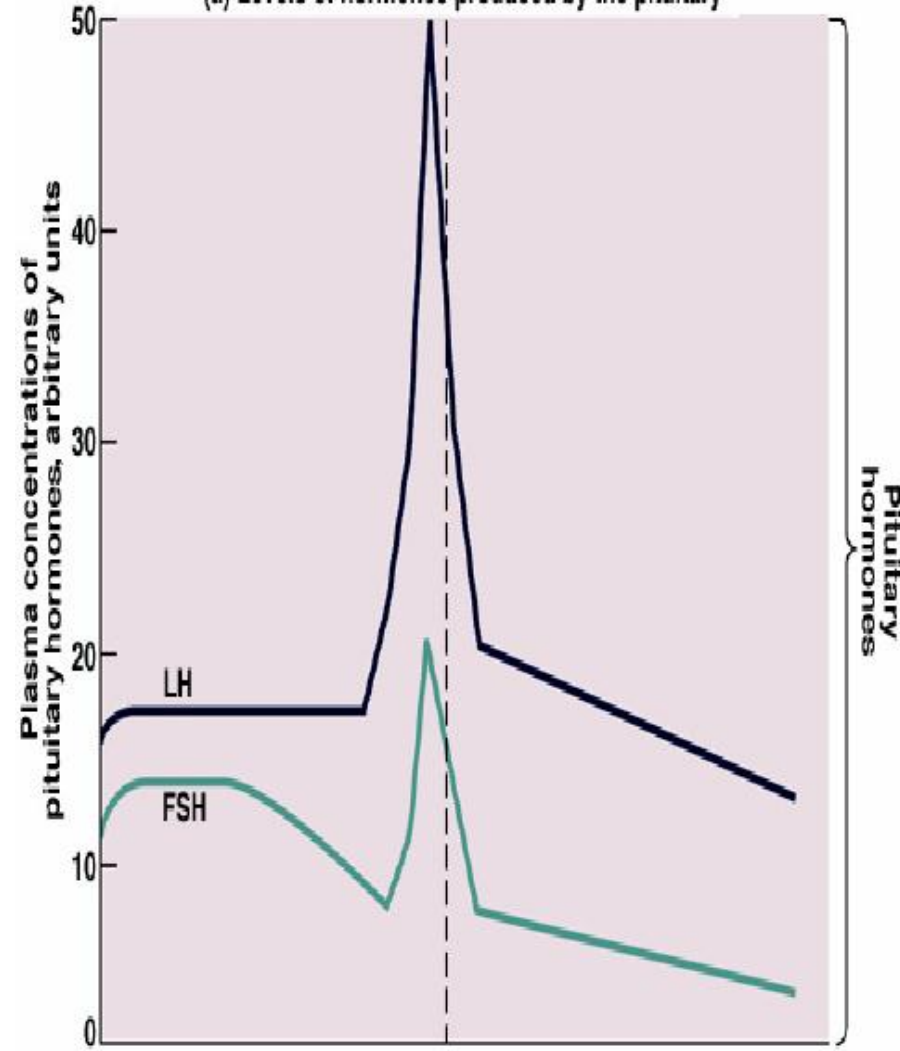
Ovulation

- Day 14 of the cycle usually marks an event called ovulation
- follicle ruptures open and releases the ripened egg
- Pituitary hormones: LH and FSH are peaking
- Estrogen is also released from follicle

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The Biological Events of Menstrual Cycle

(a) Levels of hormones produced by the pituitary



Hormones and What Happens in the Ovaries

- Luteal phase - after releasing an egg, the follicle turns into the *corpus luteum*
 - The corpus luteum manufactures progesterone
- Menstruation - shedding of the inner lining of the uterus

Length and Timing of the Cycle

Normal menstrual cycle = 20 to 36 to 40 days;
average is about 28 days

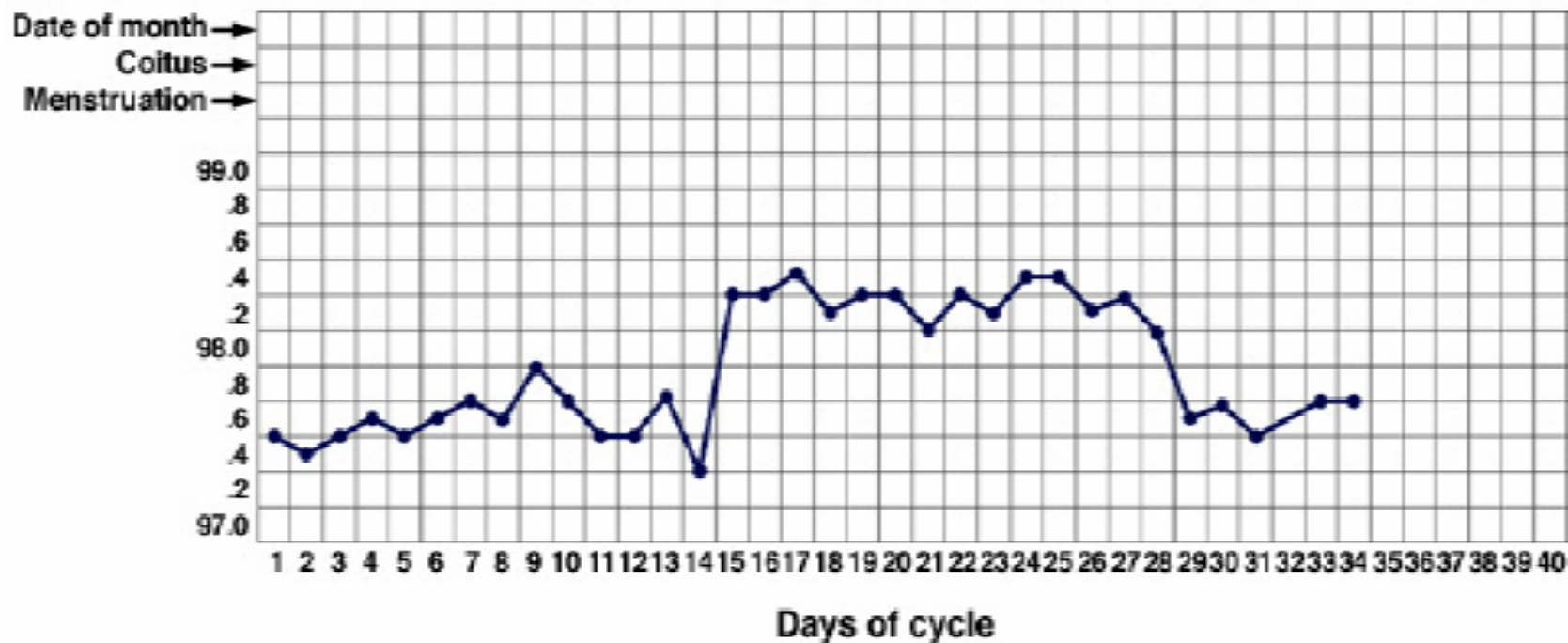
- Menstruation begins on day 1 and continues until about day 4 or 5
- Follicular phase extends from about day 5 to about day 13
- Ovulation occurs on day 14
- Luteal phase extends from day 15 to the end of the cycle, day 28

Other Cyclic Changes

Two other physiological processes fluctuate with the menstrual cycle:

- The cervical mucus cycle
- The basal body temperature cycle

A Basal Body Temperature Graph



Fluctuations in Performance

- Research on intellectual or athletic performance generally shows no fluctuations over the cycle
- Research on academic performance, problem solving, memory, or creative thinking shows no fluctuations over the cycle

What Causes the Fluctuations in Mood

Biological factors

- Fluctuations in levels of hormones
- Environmental factors
- Menstrual taboos and cultural expectations

Cycles in Men

One study found evidence of behavioral cycles in men

- Another study identified that high testosterone levels were correlated with depression
- Other researchers have found cycles in men's emotional states