|  |  |  |
| --- | --- | --- |
| **At the end of this section you should be able to …** | Y | N |
| Detailed study of the menstrual cycle and hormonal control. |  |  |
| Contemporary Issue  Menstrual disorders:  One example of a menstrual disorder from the following: endometriosis and fibroids; one possible cause, prevention and treatment. |  |  |
|  |  |
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**KEY WORDS**

Follicle stimulating hormone, luteinising hormone, Humanchorionic gonadotropin hormone, fibroids

**H. 3.6.5 Sexual Reproduction in the Human (Summary)**

Menstrual cycle is controlled by hormones produced by the pituitary gland and the ovary.

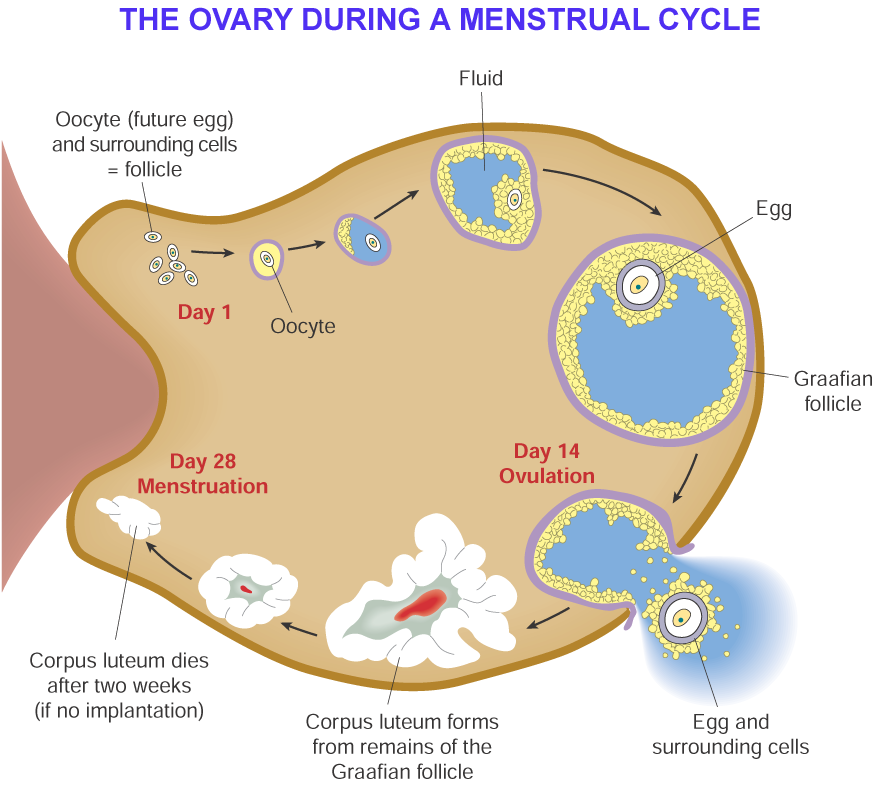
* Pituitary secretes **FSH** (follicle stimulating hormone) and the **LH** (luteinising hormone).
* The ovary produces **oestrogen** and **progesterone**.
* The menstrual cycle is an example of **feedback mechanism** of hormone control: When the level of a hormone controls the production of another hormone or of itself.

**Menstrual cycle when fertilisation does not occur:**

**Day 1**

First day of menstruation

* Corpus luteum from the previous cycle has degenerated.
* Levels of oestrogen and progesterone fall.
* Menstruation occurs
* The low levels of oestrogen and progesterone stimulate the pituitary gland to secrete the hormone FSH.
* The level of FSH rises quickly.
* The high level of FSH stimulates follicles to develop in the ovary. Follicles secrete oestrogen.

**Days 6-13**

* High levels of FSH stimulate maturation of a Graafian follicle.
* Graafian follicle secretes oestrogen. Level of oestrogen rises.

High levels of oestrogen causes

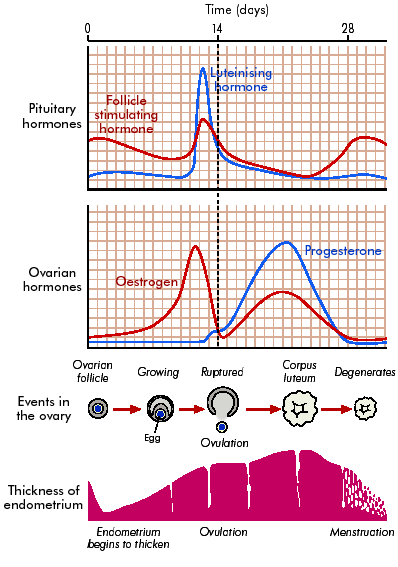
* + Repair and thickening of endometrium.
  + Inhibits further secretion of FSH.
  + Stimulates production of LH.
  + Prevents any more follicles from maturing.

**Day 14**

Ovulation

* LH secreted by the pituitary.
* Level builds up.
* High level stimulates ovulation.

**Days 15 – 26**

* High levels of LH causes the remains of the Graafian follicle to form the corpus luteum.
* Corpus luteum secretes oestrogen and progesterone.
* The high levels of oestrogen and progesterone inhibit secretion of FSH and LH from the pituitary.
* Low levels of FSH prevents graafian follicle development
* Low levels of LH
* prevent further ovulation.
* Causes the Corpus luteum to degenerate
* High level of progesterone stimulates further thickening of the endometrium for implantation of the embryo.

**Days 26 – 28**

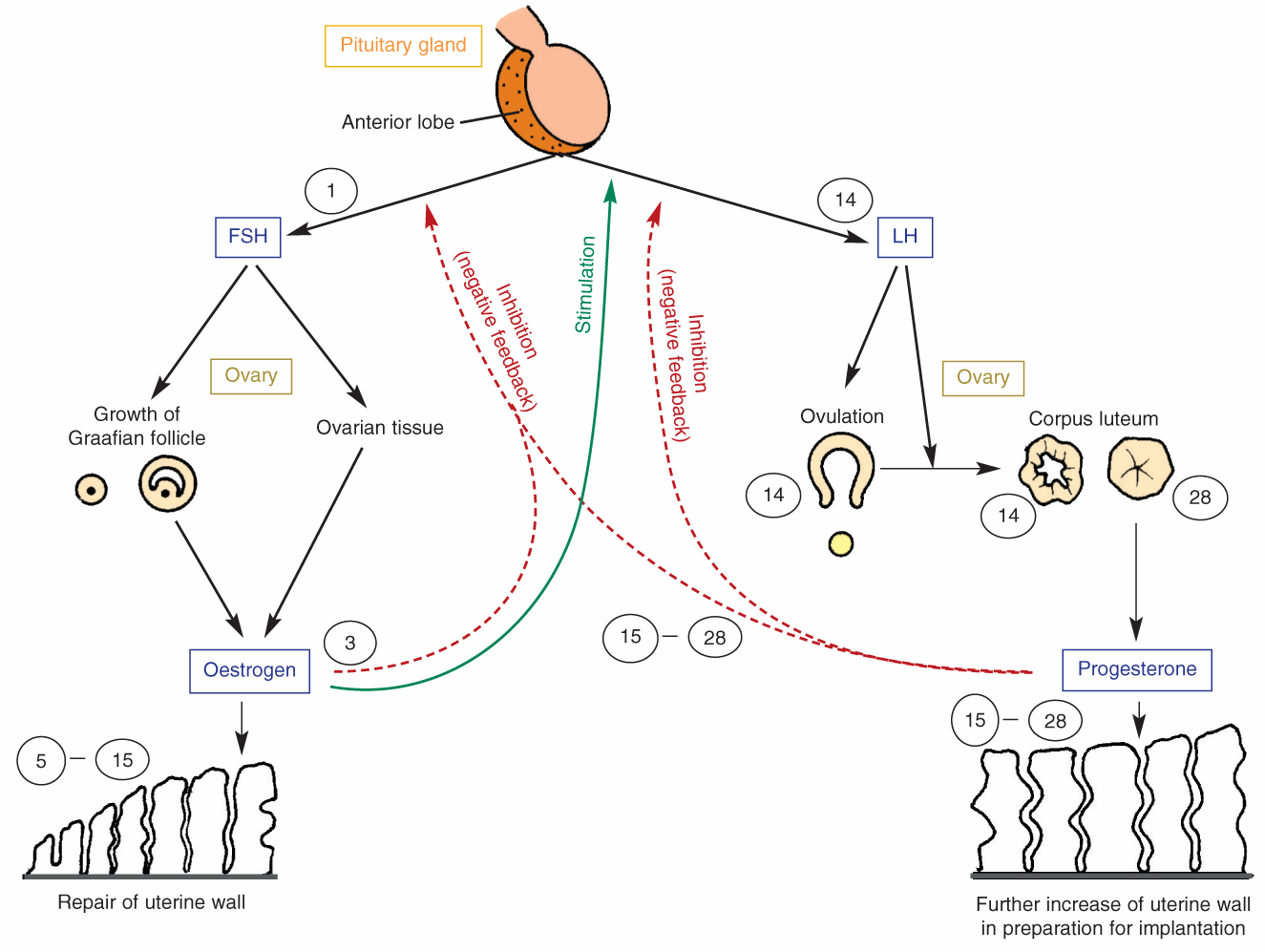
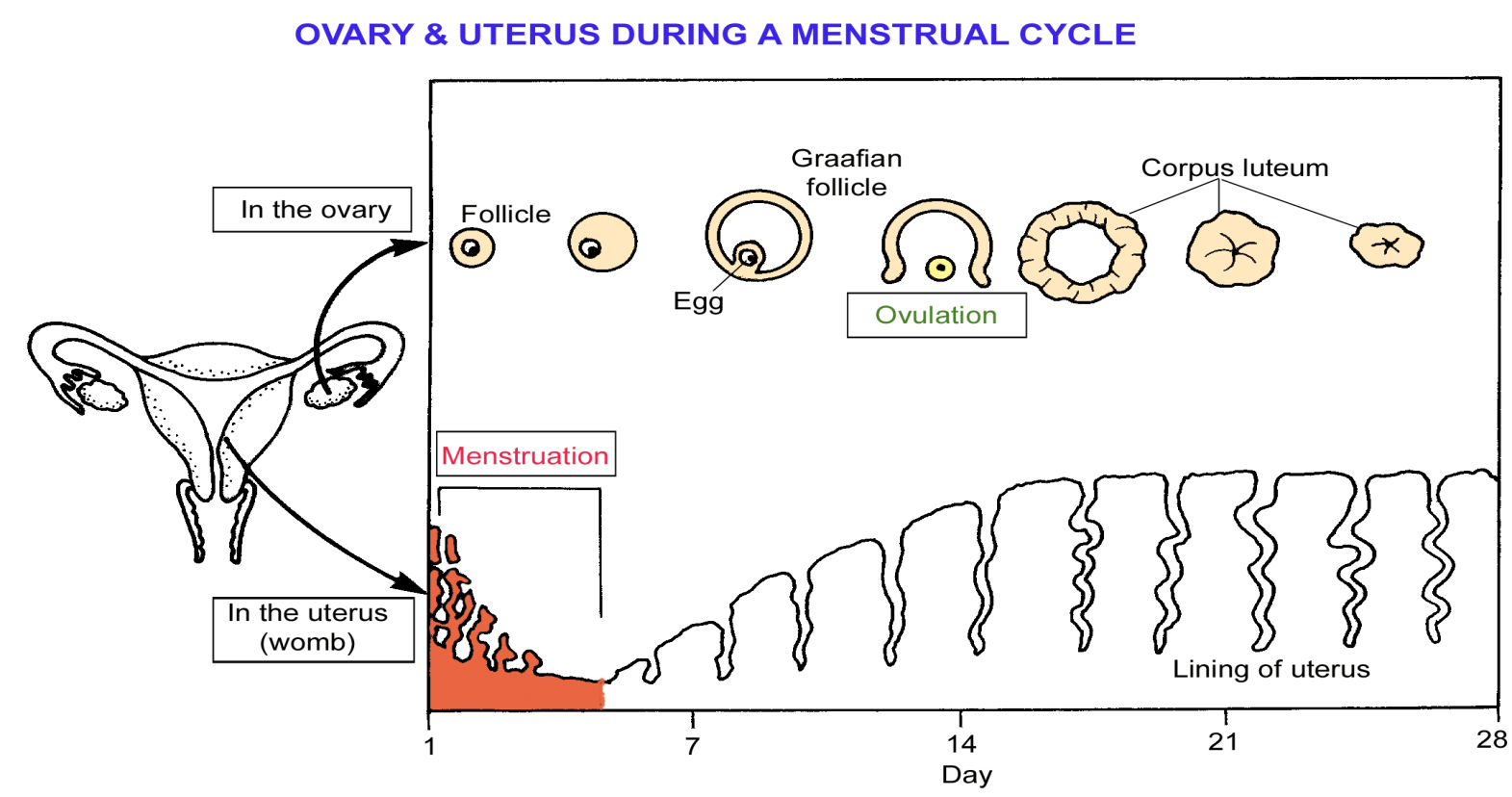
If implantation has not occurred by day 26

* The corpus luteum degenerates.
* Oestrogen and progesterone levels fall dramatically.
* Fall in progesterone causes endometrium to break down. Menstruation occurs.
* Low levels of oestrogen and progesterone stimulate the pituitary to produce to produce FSH and LH.
* Cycle begins again.

**Pregnancy**

If fertilisation occurs the menstrual cycle is interrupted.

* Implantation of embryo releases a hormone **hCG (**Humanchorionic gonadotropin hormone)
* Prevents corpus luteum from degenerating.
* Progesterone and oestrogen continue to be secreted by the corpus luteum
* The endometrium remains intact.
* High levels of progesterone prevent production of FSH
* Low levels of FSH prevent more follicles being produced and prevents ovulation
* Menstruation does not take place.
* After 3-4 months corpus luteum breaks down.
* Placenta takes over production of oestrogen and progesterone.
* Placental progesterone prevents contractions of the uterus.



**Menstrual disorder e.g. Fibroids**

* Fibroids are tumours of the uterus
* They are the result of the overproduction of cells
* They do not invade other tissues and do not spread (benign)
* Slow growing and range from the size of a pea to the size of a melon
* Common between ages of 35 and 45
* Small fibroids often produce no symptoms
* As they enlarge they produce heavy and prolonged menstrual bleeding (this can lead to anaemia, pain, miscarriage or infertility)

**Cause**

* Cause is uncertain
* May be an abnormal response to oestrogen
* Can occur in women taking the contraceptive pill

**Prevention and Treatment**

* Small fibroids require no treatment just monitoring to check their growth
* Large fibroids can be removed by surgery
* If many large fibroids are present a Hysterectomy may be necessary. This is where the uterus is removed