Ovarian follicle

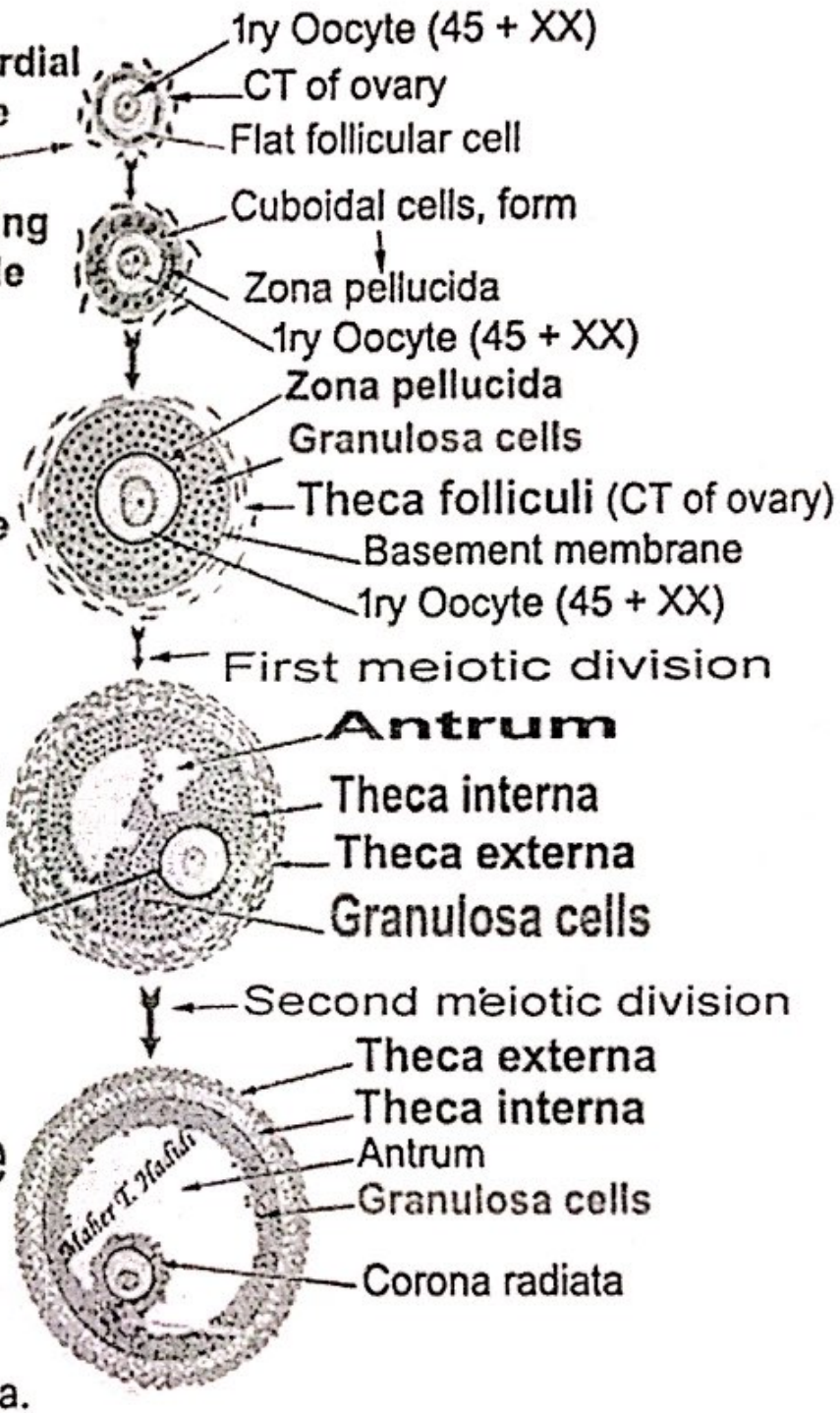
Before birth, a → **Primordial follicle** is formed that consists 1ry Oocyte covered by one layer of flat cells.

Just before puberty: Primordial follicles undergo further growth where the 1ry Oocyte is surrounded by cuboidal cells and called → **Growing follicle**

After puberty, In each menstrual cycle the cuboidal cells proliferate into multilayers of granulosa cells and now is called → **1ry follicle**

As the 1ry follicle grows, follicular fluid accumulates between granulosa cells and coalesce to form a larger cavity, the **antrum**. At this point, the follicle with antrum is called → **2ry follicle**

✓ **Zona pellucida:** A layer of glycoproteins secreted between the Oocyte and granulosa cells (probably secreted by both).



Mature 2ry (Graafian) follicle

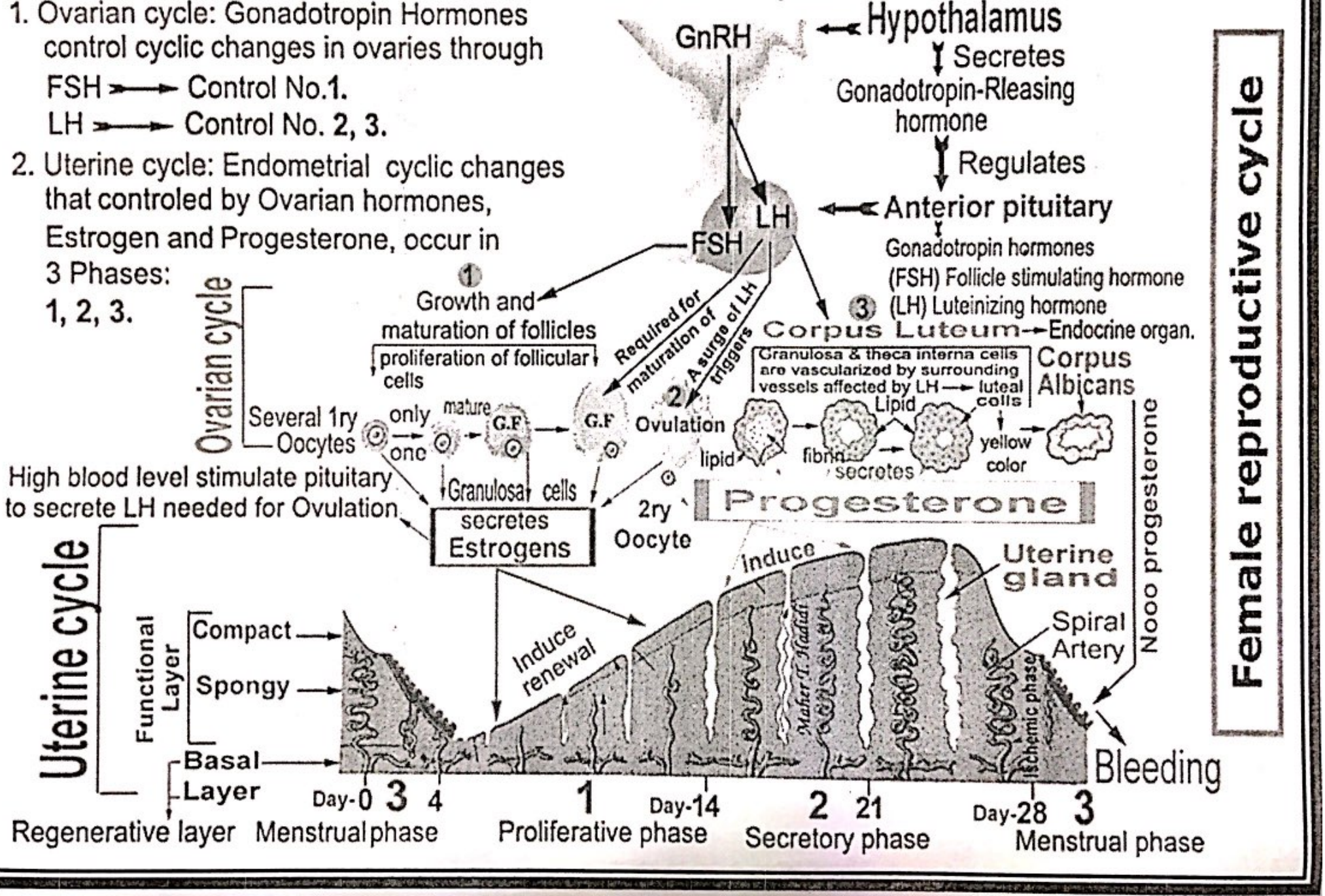
✓ As follicles grow, cells of theca folliculi organize into:
- Theca interna (inner secretory layer).
- Theca externa (outer fibrous capsule).

✓ Granulosa cells around 2ry Oocyte → Corona Radiata.

Female reproductive cycle

From puberty to menopause, females undergo monthly reproductive cycles involving hypothalamus, pituitary gland, ovaries and uterus. It includes structural and functional cyclic changes in ovaries and uterus, in preparation for pregnancy. Divided into 2 Cycles:

1. Ovarian cycle: Gonadotropin Hormones control cyclic changes in ovaries through
   FSH → Control No.1.
   LH → Control No. 2, 3.
2. Uterine cycle: Endometrial cyclic changes that controled by Ovarian hormones, Estrogen and Progesterone, occur in 3 Phases: 1, 2, 3.



MITTELSCHMERZ AND OVULATION

- A variable amount of abdominal pain—*mittelschmerz*— accompanies ovulation in some women. Mittelschmerz may be used as a secondary **sign of ovulation**; however, there are better primary indicators, including slight elevation of basal body temperature, fertile cervical mucus, and change in the cervical position.

ANOVULATION AND HORMONES

- *Some women do not ovulate* because of an inadequate release of gonadotropins. In some women, ovulation can be induced by the administration of **gonadotropins** or an ovulatory
- agent, resulting in maturation of several ovarian follicles and multiple ovulations. The incidence of multiple pregnancy may increase when ovulation is induced.

ANOVULATORY MENSTRUAL CYCLES

- In anovulatory cycles, the endometrial changes are minimal; the proliferative endometrium develops as usual, but ovulation does not occur and no **corpus luteum** forms. Consequently, the endometrium does not progress to the **luteal phase**; it remains in the proliferative phase until menstruation begins.
- The estrogen in **oral contraceptives** with or without **progesterone** (pregnancy hormone), suppresses ovulation by acting on the hypothalamus and pituitary gland; this inhibits secretion of gonadotropin-releasing hormone, follicle-stimulating hormone, and luteinizing hormone.