

Both statements are true

Initiation of the onset of puberty has long been a mystery. But now it has been determined that during childhood the hypothalamus simply **does not** secrete significant amounts of **GnRH**. One of the reasons for this is that, **during childhood**, the slightest secretion of any sex hormones exerts a strong **inhibitory effect** on hypothalamic secretion of GnRH (*gonadotropin releasing hormone*). Yet, for reasons still not understood, at the time of **puberty**, the secretion of hypothalamic GnRH breaks through the childhood inhibition, and adult sexual life begins.

On average, **females reach puberty** 1 or 2 years earlier than males. In females, puberty is marked by the first episode of menstrual bleeding, which is called **menarche**. The period of puberty is caused by a gradual increase in GnRH secretion by the pituitary, beginning in about the eighth year of life and culminating in the onset of puberty and menstruation between the ages 11 and 16 years in girls (*average, 13 years*). **Note:** In the females, as in the male, the infantile pituitary gland and ovaries are capable of full function if appropriately stimulated. However, as is also true in the male, and for reasons not understood, the hypothalamus does not secrete significant quantities of GnRH during childhood.

1. The events of puberty in the **female** (*such as enlargement of the vagina, uterus, and uterine tubes; deposition of fat in the breasts and hips*) are largely a result of increased production of **estrogens** by the ovaries.
2. Estrogen is effective at very low concentrations and generates a **slowly developing long-term response** in target tissues by binding to an intracellular receptor.
3. **Menopause** results from exhaustion of the ovarian reserve and is characterized by low ovarian hormone and elevated gonadotropin levels.
4. The **follicle** is the functional unit of the ovary. Follicles contain epithelial cells (*granulosa and cumulus*) and outer stromal cells (*thecal*). All these cells surround the **primary oocyte** that remains arrested in the first meiotic prophase until just before ovulation.
5. Follicles develop from the smallest (*primordial*) to a large antral follicle over a period of months. The latter part of the follicular development requires **gonadotropins**.
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