



Discussion

Reproductive system lectures

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Q1

- For in vitro fertilization, the female menstrual cycle is exogenously controlled utilizing several hormone treatments and assessments.
- A cycle begins by administering a receptor antagonist of Hormone 1, which stops the hypothalamic-pituitary gonadal axis for one week.
- During that week, there will be daily injections of Hormone 2, which stimulates the development of large antral ovarian follicles.
- During the next week, ultrasound is used to monitor follicular growth, and Hormone 3 is expected to increase.
- When several 18-mm follicles are seen, Hormone 4 is injected to induce oocyte maturation.
- Mature eggs are retrieved just before ovulation and mixed with, or injected with, sperm in vitro. The fertilized eggs are incubated for 3 days. During this time, the woman is injected daily with Hormone 5.
- After the embryos are transferred back to the uterus, Hormone 6 is monitored to confirm potential pregnancy. Which of the following are Hormones 1–6?

Q1

	Hormone 1	Hormone 2	Hormone 3	Hormone 4	Hormone 5	Hormone 6
A.	GnRH	FSH	E	hCG	E	hCG
B.	FSH	LH	P	E	P	P
C.	LH	GnRH	hCG	P	hCG	E
D.	GnRH	FSH	E	hCG	P	hCG
E.	FSH	LH	P	E	E	P

E: Estradiol; FSH: Follicle-stimulating hormone; GnRH: Gonadotropin-releasing hormone; hCG: Human chorionic gonadotropin; LH: Luteinizing hormone; P: Progesterone

Q2

- A young woman is given daily injections of a substance beginning on the sixteenth day of her normal menstrual cycle and continuing for 3 weeks. As long as the injections continue, she does not menstruate. The injected substance could be which of the following?
 - A) Testosterone
 - B) FSH
 - C) An inhibitor of progesterone's actions
 - D) A PGE2 inhibitor
 - E) LH**

Q3

A professional athlete in her mid-20s has not had a menstrual cycle for 5 years, although a bone density scan revealed normal skeletal mineralization. Which fact may explain these observations?

- A) She consumes a high-carbohydrate diet
- B) Her grandmother sustained a hip fracture at age 79 years
- C) Her blood pressure is higher than normal
- D) Her plasma estrogen concentration is very low
- E) **She has been taking anabolic steroid supplements or 5 years**

Q4

- Drug X causes abortion if it is administered before or soon after implantation. What is the specific effect of X?

A) It binds to LH receptors, stimulating the secretion of progesterone from the corpus luteum

B) It blocks progesterone receptors

C) It blocks the secretion of FSH by the pituitary

D) It blocks the effects of oxytocin receptors in the uterine muscle

Q5

- If a woman has a tumor that is secreting large amounts of estrogen from the adrenal gland, which of the following will occur?
- A) Progesterone levels in the blood will be very low
- B) Her LH secretion rate will be totally suppressed
- C) She will not have normal menstrual cycles
- D) Her bones will be normally calcified
- **E) All the above**

Q6

- Men who take large doses of testosterone-like androgenic steroids for long periods are sterile (non fertile). What is the explanation for this finding?
- A) High levels of androgens bind to testosterone receptors in the Sertoli cells, resulting in overstimulation of inhibin formation
- B) Overstimulation of sperm cell production results in the formation of defective sperm cells
- **C) High levels of androgen compounds inhibit the secretion of GnRH by the hypothalamus, resulting in the inhibition of LH and FSH release by the anterior pituitary**
- D) High levels of androgen compounds produce hypertrophic dysfunction of the prostate gland

Q7

A man who has been exposed to high levels of gamma radiation is sterile due to destruction of the germinal epithelium of the seminiferous tubules, although he has normal levels of testosterone. Which of the following would be found in this patient?

- A) **A normal secretory pattern of GnRH**
- B) Normal levels of inhibin
- C) Suppressed levels of FSH
- D) Absence of Leydig cells

Q8

A child raised as female presents at puberty with deepening voice and increased muscle mass. Karyotype is 46,XY. Testosterone level is normal/high. Internal male structures are present, and the prostate is small.

Which enzyme deficiency is most likely?

- A. 17β -hydroxysteroid dehydrogenase deficiency
- B. Aromatase deficiency
- C. Side-chain cleavage enzyme deficiency
- D. **$5\text{-}\alpha$ -reductase type 2 deficiency**
- E. 11β -hydroxylase deficiency

Q9

Milk is produced by a woman only after delivery, not before?

A) Levels of LH and FSH are too low during pregnancy to support milk production

B) High levels of progesterone and estrogen during pregnancy suppress milk production

C) The alveolar cells of the breast do not reach maturity until after delivery

D) Oxytocin is not secreted until the baby stimulates the nipple

E) Prolactin is not secreted until the baby is born

Q10

- The research laboratory of a fertility clinic investigates various biomolecules for their ability to induce sperm **Capacitation**. The molecules have most likely been isolated from the fluid of which of the following structures?
- A. Epididymis and sertoli
- B. Ovaries
- C. Seminal vesicles
- D. Seminiferous tubules
- **E. Uterus**

Q11

- In females, a drug formulated to prevent luteinizing hormone (LH) from binding to its receptor in luteal cells.
 - A. inhibits progesterone production by the corpus luteum**
 - B. reduces estrogen level
 - C. induces ovulation
 - D. induces long menstruation
 - E. stimulates granulosa and theca cells secretion

Q12

• When is the woman most fertile?

A. A

B. B

C. C

D. D

E. E

