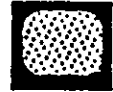


# REPRODUCTION and EMBRYOLOGY

*The anatomy of the human male and female serve to bring the sperm to the egg, which may result in fertilization, followed by the gradual embryonic and fetal steps of development. In this option we are going to examine the anatomy and physiology of both sexes. Read Chapter 21 : Human Reproductive System on pages 413-437 before proceeding.*

## The Miracle of Life



### Introduction

This program documents human reproduction through colour microphotography inside living human beings. It presents the first-ever footage of the conception of human life. Photographed by famed Swedish photographer Lennart Nilsson, it features stunning breakthroughs tracking the perilous odyssey of the sperm to the ovum.

### Before Viewing

These videos should be viewed in two classes. The first explores the female and male reproduction cycle and the second focusses on conception and the growth of the fetus from conception to birth.

### While Viewing

Pay special attention to the remarkable close-up photography of the fertilization and development of the egg into a fetus.

### After Viewing

*The Miracle of Life* can also be viewed as a follow-up to this section the reproductive system. Label Figures 19.1, 19.2, 19.7, and 19.8.

## Male Reproductive Organs

(pp. 414-415)

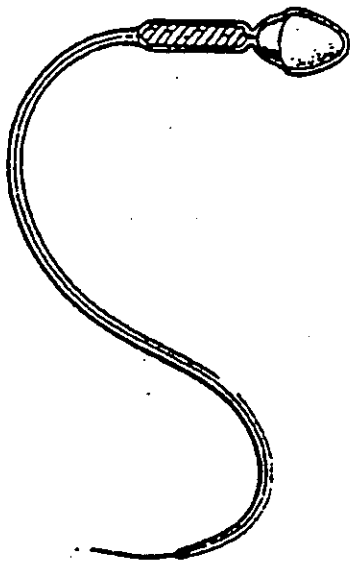
1. From fig. 21.1 page 414 identify the following structures:

- a. testes
- b. epididymis
- c. ductus deferens
- d. seminal vesicles
- e. prostate gland
- f. urethra
- g. cowper's gland
- h. penis

2. During *spermatogenesis* sperm are produced. Outline the stages of spermatogenesis. (p 415)

3. Follow the pathway of a mature sperm from the seminiferous tubules to the urethral exit, name and give the function for each structure. (Use fig. 213! p. 416)

<i>Structure listed</i>	<i>Passed through or by</i>
a. Seminiferous tubules	_____
b. _____	_____
c. _____	_____
d. _____	_____
e. _____	_____



4. From this diagram of a sperm identify its component parts by referring to it and state its function.

<i>Part of sperm</i>	<i>Function</i>
tail	_____
middle piece	_____
acrosome	_____

5. Outline the interrelationships between the gonadotropic hormones (follicle stimulating hormone-FSH and luteinizing hormone-LH) and the male hormone testosterone and spermatogenesis. (pp. 417 )

# Female Reproductive Organs

1. From *fig. 21.5 p. 418* identify the following structures of the female reproductive system by number.

Structure	Number	Function
ovaries	_____	_____
fallopian tubes (oviducts)	_____	_____
uterus (womb)	_____	_____
vagina	_____	_____
urethra	_____	_____

2. Oogenesis occurs in the development of the egg. Outline the stages in oogenesis. (*p.96*)

3. Explain how the menstrual cycle is synchronized by hormones from the (a) ovaries, (b) hypothalamus, and (c) pituitary gland. (*pp. 421-423. see diagram 21.9.* Note the simplified diagram, it is very helpful for this question).

4. Describe the sequence of events in the ovarian cycle and the impact of hormones on the events in the cycle. Note the simplified explanation on page *422* under "ovarian cycle". Try to make your own word-diagram of the cycle then list the events in sequence.

5. Examine *fig. 21.9 p.423* carefully. Compare the sequence of events in the ovary and uterus, and the levels of circulating hormones.

## Fertilization

1. Describe the physiological factors that govern the erection of the penis and ejaculation. (*pp. 415* )

2. Describe the hormonal change that occurs as a result of implantation of the fertilized egg in the endometrium lining of the uterus. (p. 424)
  - a. The level of estrogen between D1 and D13.
  - b. Hormonal levels on D14.
  - c. The level of progesterone between D1 and D23.
  - d. The result of the decrease in estrogen or progesterone level from D24 to D28k.
  
3. Describe what is meant by *in vitro* fertilization? (p. 428)
  
4. From your knowledge of human anatomy and physiology explain how the following methods of birth control work. (pp. 425-6.)
  - a. vasectomy
  - b. tubal ligation
  - c. intrauterine device (IUD)
  - d. diaphragm
  - e. cervical cup
  - f. condom
  - g. vaginal sponge
  - h. coitus interruptus
  - i. spermicidal jellies

## Disorders of the Human Reproductive System

1. State the *characteristics, possible causes, and corrective measures* for the following disorders:
  - a. cervical cancer
  - b. breast cancer
  - c. impotence
  - d. gonorrhea
  - e. herpes simplex II
  - f. syphilis

# Stages of Embryonic Development

1. Explain the following: (pp. 448-451...)

- a. gametogenesis
- b. fertilization
- c. cleavage
- d. gastrulation
- e. organogenesis
- f. tissue specialization

## Human Development

(pp. ...)

1. Differentiate between *embryonic* development and *fetal* development. (p. 452)

2. Briefly describe how the following processes apply to a human embryo:

- a. cleavage
- b. morphogenesis
- c. differentiation

3. Explain why the mother must be careful with her diet, health habits, and lifestyle during the first and last months of pregnancy. p. 454

# Sample Exam Questions

1. Explain the following terms:
  - a. gametogenesis
  - b. fertilization
  - c. cleavage
  - d. gastrulation
  - e. morphogenesis
2. Describe the process of *in vitro* fertilization.
3. Name and describe the function of TWO hormones that are secreted by the placenta.
4. Describe the function of the following structures:
  - a. urethra
  - b. epididymis
  - c. oviduct
  - d. uterus
5. State how the following prevents pregnancy:
  - a. tubal ligation
  - b. vasectomy
6. State the function of the *acrosome* and *middle piece* of the sperm.
7. Describe any TWO hormonal changes in a female that occur as a result of implantation of the embryo.
8. Name the source and describe the function of FSH (follicle stimulation hormone) in the female reproductive system.
9. The male sex hormone, testosterone, is maintained at a fairly constant level in the body by a feedback process. How does the body restore testosterone level when it drops below normal?
10. Name one birth control method and explain how it works.