LESSON ASSIGNMENT

LESSON 9
The Human Reproductive (Genital) System.

LESSON ASSIGNMENT
Paragraphs 9-1 through 9-23.

LESSON OBJECTIVES
After completing this lesson, you should be able to:

9-1. Given a list of statements describing functions of the human reproductive system, identify the false statement.

9-2. Match names of subgroups of reproductive organs with their definitions.

SUGGESTION
After completing the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.
LESSON 9
THE HUMAN REPRODUCTIVE (GENITAL) SYSTEM

Section I. INTRODUCTION

9-1. DEFINITION

The human reproduction system is a collection of organs for the production of offspring. Thus, succeeding generations are provided for the continuation of the species.

9-2. TWO DISTINCT SEXES

In humans there are two distinctly separate sexes, male and female. The presence of different anatomical forms of the two sexes is called sexual dimorphism.

\[ DI = \text{two} \]

\[ \text{MORPH} = \text{body form} \]

\[ \text{SEXUAL} = \text{by virtue of sex} \]

The contribution of hereditary materials by two parents increases the chances for improved genetic recombinations.

9-3. SEX HORMONES

Sex hormones are body chemicals associated with sex and sexual development. They belong to a chemical group called steroids. Sex hormones are formed primarily in two types of organs: the gonads and the adrenal cortex. (The adrenal cortex is the outer layer of the adrenal gland, which rests upon each kidney). The sex hormones of the female are called estrogens and progesterone. The sex hormones of the male are called androgens.

9-4. MAJOR ORGAN SUBGROUPS

In both males and females, the organs of the reproductive system can be grouped according to function. These subgroups are the primary sex organs (gonads), the secondary sex organs, and the secondary sexual characteristics.
9-5. EXTERNAL GENITALIA

In both sexes, there are certain structures at the surface known as the **external genitalia**.

9-6. COMMON EMBRYONIC ORGANS

In male and female embryos, there is a common origin of the organs of the reproductive system. (The organs of the urinary system share this common origin). The importance of this common origin is that, under certain conditions, females may develop with males characteristics, males may develop with female characteristics, and even true intersexes may occur. (**True intersexes** possess both male and female gonadal tissue.)

9-7. SEX DETERMINATION

At the moment the egg is fertilized by the sperm, the new genetic combination determines whether the individual will be male or female. Later in development, however, sex hormones play an important role in the production of sexual organs and characteristics.

Section II. GAMETES (SEX CELLS)

9-8. INTRODUCTION

Within the genetic makeup of each individual, there is a pair of chromosomes known as the **sex chromosomes**. There are two kinds of such chromosomes--X and Y.

9-9. MEIOSIS

Within the gonads, there is a special type of cell division known as **meiosis**. The usual set of chromosomes is reduced in this reduction division. Thus, the gametes (ova or spermatozoa) have only a single set of chromosomes.

9-10. FERTILIZATION

In the final analysis, the production of a new individual is based upon the union of the male gamete (spermatozoon) with the female gamete (ovum). This process is called **fertilization**. At this time, a double set of chromosomes is reconstituted.

a. If the zygote (fertilized egg) has two X chromosomes, the individual will be female (XX).
b. If the zygote has one X and one Y chromosome, the individual will be male (XY).

Section III. THE MALE REPRODUCTIVE SYSTEM (FIGURE 9-1)

Figure 9-1. The human male reproductive (genital) system.
9-11. PRIMARY SEX ORGAN--TESTIS

The testis is the primary sex organ (gonad) of the male.

a. **Location.** Each male has a pair of testes located within the scrotum. The **scrotum** is a sac suspended from the inferior end of the trunk, between the thighs. Each testis is within a separate serous cavity within the scrotum.

   (1) **Migration.** Originally, testes develop within the posterior abdominal region of the body. However, during development, they "migrate" out of the body cavity, through the inguinal canal of the abdominal wall, and into the scrotum.

   (2) **Temperature control.** For the production of mature sperm (spermatozoa), the testes must be at a temperature that is a few degrees lower than that of the body cavity. For this reason, the testes are located outside of the body cavity.

      (a) Under cold conditions, each testis is pulled up toward the body by the **cremaster muscle.** At the same time, the dartos muscle of the scrotal wall contracts and thus reduces the exposed surface area and thickens the wall.

      (b) Under warm conditions, these structures are "relaxed." This allows the scrotum with the testes to hang free.

      (c) If a boy baby is born with undescended testes (either in the abdominal cavity or inguinal canal) and if nothing is done to bring the testes into the scrotum, he will be sterile.

b. **Production of Spermatozoa.** Millions of spermatozoa (male gametes) are produced by the seminiferous tubules of the testis.

   \[ \text{SEMEN} = \text{seed} \]

   \[ \text{FER} = \text{to carry} \]

The male sex hormones (androgens) are also produced by cells of the testes.

9-12. SECONDARY SEX ORGANS

In general, the secondary sex organs of the male are responsible for the transport and care of the spermatozoa.

a. **Epididymis.** The spermatozoa pass from the seminiferous tubules into the tubular structure known as the epididymis. The epididymis is a very long tube, but it is coiled and attached to the surface of the testis in the scrotum. As the spermatozoa pass along the length of the epididymis, they are nurtured by the secretions of the
epididymal wall. During this passage through the epididymis, the spermatozoa become mature functioning gametes. They remain in the epididymis until "called for."

b. **Ductus (Vas) Deferens.** During sexual excitement, the spermatozoa leave the epididymis and are carried by another duct known as the ductus deferens. The ductus deferens passes through the inguinal canal, enters the body cavity, and turns into the pelvic cavity.

c. **Seminal Vesicle.** At the posterior surface of the prostate gland, the ductus deferens is joined by another duct called the seminal vesicle. The seminal vesicle is also a long tubular structure, but it is coiled up into a small mass at the back of the prostate gland. The seminal vesicle produces a nutrient fluid that helps to maintain the spermatozoa.

d. **Ejaculatory Duct.** On each side, as the ductus deferens and seminal vesicle join, they form a single tube on the same side, called the ejaculatory duct. Each ejaculatory duct, left and right, carries the seminal vesicle secretion and spermatozoa through the substance of the prostate gland. Each ejaculatory duct empties into the prostatic urethra.

e. **Prostate Gland.** The prostate gland is located in the pelvic cavity immediately under the urinary bladder. The urethra of the urinary system passes through the substance of the prostate gland, where it is known as the prostatic urethra. The prostate gland also adds a secretion. Altogether, the combination of secretions and spermatozoa is known as the semen.

f. **Urethra.** In the male, the urethra is common to both the urinary system and the reproductive system. At different times, it carries either the urine or the semen.

(1) As already mentioned, the initial part of the urethra passes through the prostate gland and is called the prostatic urethra.

(2) Immediately below the prostate gland, the urethra passes through the perineal membrane. Here, it is surrounded by the external urethral sphincter. This short section of the urethra is called the membranous urethra.

(3) That portion of the urethra passing through the penis (discussed below) is known as the penile urethra.

g. **Penis.** The penis is a structure attached to the pubic arch of the bony pelvis and to the underside of the perineal membrane. It is an external structure of the male genital system, which is capable of enlargement and stiffening (erection).

(1) The most favorable position for the deposit of semen (spermatozoa) is the upper recess of the vagina. This is opposite the opening of the cervix of the uterus. For this purpose, the penis is inserted into the female vagina ("sheath").
(2) Covering the glans ("head") of the penis is a fold of skin called the prepuce. In many cultures, the prepuce is removed shortly after birth in the procedure called circumcision. At the base of the glans, there are glands that secrete a lipid-like material called smegma. Thus, there is a need for continual cleanliness.

9-13. SECONDARY SEXUAL CHARACTERISTICS

The secondary sexual characteristics of the male are those features designed to make a male attractive to the female. They help ensure that the two sexes will get together to produce the new generation. Among the more obvious of these features are muscularity, deep voice, and hair distribution.

Section IV. THE FEMALE REPRODUCTIVE SYSTEM (FIGURE 9-2)

Figure 9-2. The human female reproductive (genital) system.
9-14. PRIMARY SEX ORGAN--OVARY

The ovary is the primary sex organ (gonad) of the female.

a. Location. Each female has a pair of ovaries, located in the pelvic cavity. Each ovary is attached to the posterior aspect of the broad ligament on its respective side of the uterus.

b. Production of the Ovum. One female gamete (ovum) is released per menstrual cycle (about 28 days).

(1) Within an ovary, one of the germinal cells begins to develop and grows larger as it stores food material. This development takes place within a follicle, a fluid-filled cavity within the ovary.

(2) At midperiod, the mature ovum is expelled from the follicle onto the surface of the ovary. The free ovum is picked up by the uterine tube. (para 9-15a).

c. Production of Female Sex Hormones. Initially, the cells of the ovary that form the follicle secrete the hormones called estrogens. After the ovum has been expelled from the follicle, the resulting cavity is filled with a yellowish material known as the corpus luteum. The corpus luteum secretes primarily progesterone, a hormone that helps prepare the uterus for pregnancy. Thus, estrogens are secreted during the first half of the menstrual cycle, and progesterone is added during the second half of the period. This pattern of hormone secretion is a major factor in the menstrual cycle.

9-15. SECONDARY SEX ORGANS

The secondary sex organs of the female serve to transport and care for the ovum and to develop the new individual (embryo and fetus).

a. Uterine Tube (Oviduct, Fallopian Tube). The uterine tube picks up the free ovum when it is expelled from the follicle of the ovary. The ovum stays in the uterine tube to await fertilization. If it is fertilized, it goes through the initial stages of embryonic development, and the embryo then passes on to the uterus. On the other hand, if it is not fertilized, its stored food is exhausted in 3 to 5 days; it dies and its remains are absorbed by the uterine tube.

b. Uterus. The uterus is a single pear-shaped organ located within the pelvic cavity of the female. The early embryo passes into the uterus from the uterine tube. The embryo continues its development within the uterus.

(1) Endometrium. The inner lining of the uterus is known as the endometrium. The endometrium is an epithelium containing uterine glands and blood vessels. Under the influence of the estrogens and progesterone, the embryo present at
the end of the menstrual cycle, the endometrium breaks down. (This produces a "flow" of blood and cellular elements (menses) in a process known as menstruation.)

(2) Amniotic sac and placenta. When the embryo passes into the uterine cavity from the uterine tube, it "burrows" into the endometrium. Later, a fluid-filled sac (the amniotic sac) surrounds the embryo. The embryo floats free, surrounded by amniotic fluid. The embryo has an umbilical cord that originates in the center of its anterior abdomen. The umbilical cord is attached to the wall of the uterus by a special structure known as the placenta.

(3) Cervix. The cervix, the inferior end of the uterus, is inserted into the top of the vagina. Through the center of the cervix is the cervical canal. Its wall consists primarily of circular muscle tissue, which holds the opening closed until time for parturition (giving birth). During the initial stage of parturition, the cervical musculature dilates (stretches) to form an opening for the passage of the newborn (to be).

c. Vagina. The vagina is a tubular structure that extends from the cervix of the uterus to the exterior of the perineum. After the vagina receives the male penis, the semen is discharged into the upper recess opposite the opening of the cervix. At parturition, the vagina forms the birth canal through which the newborn passes to the outside.

d. External Genitalia. The opening of the vagina and of the urethra are covered by the external genitalia. Included among the external genitalia are two pairs of folds—the major and minor labia. Also included is the clitoris, a small structure comparable to the male penis but without the urethra.

9-16. SECONDARY SEXUAL CHARACTERISTICS

The secondary sexual characteristics of the female are those features designed to make a female attractive to the male. These features include a higher-pitched voice, hair distribution, and body softness and shape.

9-17. THE FEMALE BONY PELVIS

The female bony pelvis is an important consideration in childbirth.

a. Several studies have been concerned with the spatial relationships of the female bony pelvis. One of the most extensive is the Caldwell-Moloy Classification of Female Pelvis. This study categorizes female pelvis by shape. It illustrates those types that are better and those that are less well suited for childbirth.

b. Just before childbirth, the phenomenon of "relaxation" occurs. In this phenomenon, the ligaments of the bony pelvis and perineum become quite stretchable. This increases the diameters of the birth canal.
9-18. THE MAMMARY GLAND

The mammary glands are cutaneous glandular structures of the female.

a. Location. The mammary glands are located in the upper pectoral regions. On occasion, a mammary gland may be found elsewhere along the "milk line." The milk line extends from the axilla above to the inguinal region below.

b. Structure. Each mammary gland is made up of glandular tissue and associated ducts. These structures are embedded in FCT and fat.

c. Lactation. During pregnancy, the mammary glands respond to the estrogens and progesterone with additional growth. Toward the end of pregnancy, it begins to form a fluid substance, colostrum. Within 2 or 3 days after the baby is born, the breasts begin to secrete large quantities of milk instead of colostrum.

d. Importance of Nursing. One cannot overemphasize the importance of nursing (breast-feeding) the newborn.

(1) Human milk is the natural food of the newborn infant.

(2) Strong psychological effects accompany nursing. This is true for both the child and the mother.

(3) Initially after childbirth, the mammary gland secretes colostrum. Colostrum is not primarily a food item. In fact, the baby loses birth weight. Colostrum consists most importantly of antibodies that protect the newborn during the first 6 months of life.

(4) A baby may develop an upper respiratory infection. During suckling, it will inject some of the microorganisms into the milk ducts of the mammary gland. By the next feeding, the mammary gland has produced the antibodies appropriate for that infection.

e. Self-Examination. The female breast (mammary gland) is often a location for tumor growth. Thus, it is important for a woman to be able to examine her own breasts. During this self-examination, she must remember that a portion of the breast extends up into the axilla. (This portion is called the "axillary tail.")
Section V. INTRAUTERINE DEVELOPMENT

9-19. GENERAL

The site of fertilization (when it occurs) is usually in the uterine tube. Initial development of the embryo also takes place in the uterine tube. However, most development is intrauterine (within the uterus).

a. Embryo. During the first 8 weeks of development, the developing individual is called an embryo. The processes by which the embryo develops are studied in embryology.

b. Fetus. During the remainder of the intrauterine period, the developing individual is known as the fetus. During this latter period, the details of structure and function develop.

9-20. SUPPORT OF THE EMBRYO AND FETUS

In paragraph 9-15b(2), we discussed the amniotic sac, umbilical cord, and placenta. During intrauterine development, the embryo/fetus is within the amniotic sac. Floating free in the amniotic fluid, it is connected to the placenta by the umbilical cord. The placenta is the specific area of exchange between the maternal blood and the fetal blood. By this exchange, the fetus gets rid of waste materials and acquires food, oxygen, and other needed substances from the mother.

Section VI. PARTURITION

9-21. DEFINITION

Parturition is the process of childbirth.

9-22. INITIAL PHASE

The initial phase includes dilation (stretching) of the uterine cervix. At the appropriate moment, the amniotic membranes rupture and release the amniotic fluid.

9-23. PASSAGE OF THE FETUS

The release of amniotic fluid is followed by the passage of the fetus through the birth canal.

a. During this passage, the newborn makes two partial rotations to accommodate the diameters of the relaxed bony pelvis.
b. In the birthing process, there are several reflexes occurring at appropriate times. Natural childbirth (without anesthetics or similar devices) allows these reflexes to occur normally. Since the uterine wall musculature (myometrium) is not capable of expelling the fetus by itself, the mother must learn how to utilize the abdominal wall musculature in coordination with the uterine wall musculature to effect a normal childbirth.

c. The head of the newborn presents itself in the perineum. If the central tendon of the perineum has not relaxed sufficiently, an episiotomy may be performed. This procedure involves cutting the posterior margin of the vagina to prevent tearing. Proper repair of the central tendon is essential to the proper recovering of the pelvis and perineum.

d. After the birth of the newborn, the placenta and amniotic membranes ("afterbirth") are delivered. These are accompanied by a significant flow of blood.

Continue with Exercises
EXERCISES, LESSON 9

REQUIREMENT. The following exercises are to be answered by completing the incomplete statements.

After you have completed all the exercises, turn to "Solutions to Exercises" at the end of the lesson, and check your answers.

1. Sex hormones belong to a chemical group called ____ s. Sex hormones are formed primarily by the ___ ds and the ____ l cortex. The sex hormones of the female are called ____ s and ____ e. The sex hormones of the male are called ____________ s.

2. Whether an individual will be male or female is determined at the moment the egg is ____ d by the sperm. This is determined by the new ____ c combination. Substances that later influence the production of sexual organs and characteristics are the sex ____ s.

3. The two kinds of sex chromosomes are ___ and ___.

Within the gonads, there is a special type of cell division known as m ____ s. The gametes, formed with this type of cell division, have a (single) (double) set of chromosomes.

The production of a new individual is based upon the union of two ____ s, that is, a s ____ n and an ____ m. This process is called f ____ n. This produces a zygote with a (single) (double) set of chromosomes. If the zygote has two X chromosomes (XX), the individual will be a _____. If the zygote has one X and one Y chromosome (XY), the individual will be a ________.

4. During development, the testes "migrate" out of the body cavity, through the ____ l canal of the abdominal wall, and into the ________. The testes are generally cooler than the body cavity to ensure production of ____ e sperm. If undescended testes remain uncorrected, the male will be ____ e.

Produced within each testis are millions of ____ a and a ____ s.

5. The secondary sex organs of the male are responsible for the transport and care of the ________ a.

As the spermatozoa pass along the length of the epididymis, they are ____ d by the secretions of the epididymal wall.
The seminal vesicle produces a n_______t fluid, which helps to maintain the ___________a.

In the male, the combination of secretions and spermatozoa is known as the _______ n.

6. The penis is capable of _______ n. The most favorable position in the vagina for the deposit of semen is the upper recess of the _______ a, opposite the opening of the _______ x of the _______ s.

7. The secondary sexual characteristics of the male are those features designed to make a male ________ve to a female.

8. One ovum is released per _________ l cycle.

   The development of a germinal cell takes place within a ________ e, a fluid-filled cavity within the _______ y.

   At midperiod, the mature ovum is expelled from the _______ e onto the surface of the ovary and is then picked up by the _______ e tube.

9. Initially, the cells of the ovary that form the follicle secrete the hormones called ________s. After the ovum has been expelled from the follicle, the resulting cavity is filled with a yellowish material known as the ______ s _______ m, which secretes primarily ________ e. This hormone prepares the ______ s for pregnancy. Thus, during the first half of the menstrual period _______ s are secreted; during the second half of the menstrual period ________ e is added.

10. The secondary sex organs of the female serve to transport and care for the ______ and to develop the e_______e and ______ s.

    The uterine tube picks up the free ______ when it is expelled from the _______ e of the ovary. The ovum stays in the uterine tube to await ________ n. If it is fertilized, it goes through the initial stages of development as an _______ o, which then passes on to the ______ s. If it is not fertilized within 3 to 5 days, its stored ______ is exhausted and it ______.
11. The embryo continues its development within the ___________ whose inner lining is known as the ___________ m. This inner lining contains ___________ e glands and blood vessels. To receive the early embryo, the endometrium is d_________. If there is no embryo present at the end of the menstrual cycle, the ___________ m breaks down. Thus, a "flow" of blood and cellular elements occurs in a process known as ___________.

When the embryo passes into the uterus from the uterine tube, it "burrows" into the ___________. Later, the fluid-filled ___________ c sac surrounds the embryo. The embryo floats free, surrounded by ___________ c fluid. The embryo has an ___________ l cord that originates in the center of its anterior ___________ n. This cord is attached to the wall of the uterus by a special structure known as the ___________ a.

The circular muscle tissue in the wall of the cervix holds the opening closed until time for ___________ n, when the musculature d_________ s to form an ___________ g for the passage of the ___________ n to be.

12. After the vagina receives the male penis, the semen is discharged into the upper recess opposite the opening of the ___________ x. At parturition, the vagina forms the ___________ h ___________ l through which the newborn passes to the outside.

The openings of the vagina and urethra are covered by the external ___________ a.

13. The secondary sexual characteristics of the female are those features designed to make a female ___________ ve to the male.

14. When the female bony pelvis "relaxes" for childbirth, the ligaments of the bony ___________ s and ___________ m become quite stretchable. This increases the ___________ s of the birth canal.

15. The mammary glands respond to the estrogens and progesterone with additional ___________ h. Towards the end of the pregnancy, the breasts begin to form a fluid substance, ___________ m. Within 2 to 3 days after the birth, the breasts begin to secrete large quantities of ___________.

Human milk is the natural ___________ of the newborn infant.

Accompanying nursing, for both the child and the mother, are strong p___________ l effects.

Initially after childbirth, the mammary gland secretes ___________ m, consisting most importantly of ___________ s, which protect the infant during the first 6 ___________ s of life.
Later, the mother’s milk contains _______s for specific infections of the child.

It is important for a woman to be able to ______e her own breasts.

16. The placenta is the specific area of exchange between the maternal _____d and the ______l ______. By this exchange, the fetus gets rid of ______ materials and acquires ______d, ______ n, and other needed substances from the mother.

17. Parturition is the process of ________h.

The initial phase includes s________ g of the uterine cervix. At the appropriate moment, the _______c membranes rupture and release the _______ fluid.

During its passage through the birth canal, the newborn makes two partial r________s to accommodate the diameters of the relaxed bony pelvis.

In natural childbirth, there are several ________xes occurring normally at appropriate times.

The head of the newborn presents itself in the ________m.

After the birth of the newborn, the ________ a and ________ c m ________ s are delivered.

Check Your Answers on Next Page
1. Sex hormones belong to a chemical group called steroids. Sex hormones are formed primarily by the **gonads** and the **adrenal cortex**. The sex hormones of the female are called **estrogens** and **progesterone**. The sex hormones of the male are called **androgens**. **(para 9-3)**

2. Whether an individual will be male or female is determined at the moment the egg is fertilized by the sperm. This is determined by the new genetic combination. Substances that later influence the production of sexual organs and characteristics are the sex **hormones**. **(para 9-7)**

3. The two kinds of sex chromosomes are **X and Y**.

   Within the gonads, there is a special type of cell division known as **meiosis**. The gametes, formed with this type of cell division, have a **single** set of chromosomes.

   The production of a new individual is based upon the union of two **gametes**, that is, a **spermatozoon** and an **ovum**. This process is called **fertilization**. This produces a zygote with a **double** set of chromosomes. If the zygote has two **X** chromosomes (XX), the individual will be a **female**. If the zygote has one **X** and one **Y** chromosome (XY), the individual will be a **male**. **(paras 9-8 thru 9-10)**

4. During development, the testes "migrate" out of the body cavity, through the **inguinal canal** of the abdominal wall, and into the **scrotum**. The testes are generally cooler than the body cavity to ensure production of **mature** sperm. If undescended testes remain uncorrected, the male will be **sterile**.

   Produced within each testis are millions of **spermatozoa** and **androgens**. **(para 9-11)**

5. The secondary sex organs of the male are responsible for the transport and care of the **spermatozoa**.

   As the spermatozoa pass along the length of the **epididymis**, they are **nurtured** by the secretions of the epididymal wall.

   The **seminal vesicle** produces a **nutrient** fluid that helps to maintain the **spermatozoa**.

   In the male, the combination of secretions and spermatozoa is known as the **semen**. **(para 9-12)**

6. The penis is capable of **erection**. The most favorable position in the vagina for the deposit of semen is the upper recess of the **vagina**, opposite the opening of the **cervix** of the **uterus**. **(para 9-12g(1))**
7. The secondary sexual characteristics of the male are those features designed to make a male attractive to a female. (para 9-13)

8. One ovum is released per menstrual cycle.

   The development of a germinal cell takes place within a follicle, a fluid-filled cavity within the ovary.

   At midperiod, the mature ovum is expelled from the follicle onto the surface of the ovary and is then picked up by the uterine tube. (para 9-14b)

9. Initially, the cells of the ovary that form the follicle secrete the hormones called estrogens. After the ovum has been expelled from the follicle, the resulting cavity is filled with a yellowish material known as the corpus luteum, which secretes primarily progesterone. This hormone prepares the uterus for pregnancy. Thus, during the first half of the menstrual period estrogens are secreted, during the second half of the menstrual period progesterone is added. (para 9-14c)

10. The secondary sex organs of the female serve to transport and care for the ovum and to develop the embryo and fetus.

    The uterine tube picks up the free ovum when it is expelled from the follicle of the ovary. The ovum stays in the uterine tube to await fertilization. If it is fertilized, it goes through the initial stages of development as an embryo, which then passes on to the uterus. If it is not fertilized within 3 to 5 days, its stored food is exhausted and it dies. (para 9-15)

11. The embryo continues its development within the uterus, whose inner lining is known as the endometrium. This inner lining contains uterine glands and blood vessels. To receive the early embryo, the endometrium is developed. If there is no embryo present at the end of the menstrual cycle, the endometrium breaks down. Thus, a "flow" of blood and cellular elements occurs in a process known as menstruation.

    When the embryo passes into the uterus from the uterine tube, it "burrows" into the endometrium. Later, the fluid-filled amniotic sac surrounds the embryo. The embryo floats free, surrounded by amniotic fluid. The embryo has an umbilical cord that originates in the center of its anterior abdomen. This cord is attached to the wall of the uterus by a special structure known as the placenta.

    The circular muscle tissue in the cervix holds the opening closed until time for parturition, when the musculature dilates to form an opening for the passage of the newborn to be. (para 9-15b)
12. After the vagina receives the male penis, the semen is discharged into the upper recess opposite the opening of the cervix. At parturition, the vagina forms the birth canal through which the newborn passes to the outside.

The openings of the vagina and urethra are covered by the external genitalia. (paras 9-15c, d)

13. The secondary sexual characteristics of the female are those features designed to make a female attractive to the male. (para 9-16)

14. When the female bony pelvis "relaxes" for childbirth, the ligaments of the bony pelvis and perineum become quite stretchable. This increases the diameters of the birth canal. (para 9-17)

15. The mammary glands respond to the estrogens and progesterone with additional growth. Towards the end of the pregnancy, the breasts begin to form a fluid substance, colostrum. Within 2 to 3 days after the birth, the breasts begin to secrete large quantities of milk.

Human milk is the natural food of the newborn infant.

Accompanying nursing, for both the child and the mother, are strong psychological effects.

Initially after childbirth, the mammary gland secretes colostrum, consisting most importantly of antibodies, which protect the infant during the first 6 months of life.

Later, the mother’s milk contains antibodies for specific infections of the child.

It is important for a woman to be able to examine her own breasts. (para 9-18)

16. The placenta is the specific area of exchange between the maternal blood and the fetal blood. By this exchange, the fetus gets rid of waste materials and acquires food, oxygen, and other needed substances from the mother. (para 9-20)

17. Parturition is the process of childbirth.

The initial phase includes stretching of the uterine cervix. At the appropriate moment, the amniotic membranes rupture and release the amniotic fluid.

During its passage through the birth canal, the newborn makes two partial rotations to accommodate the diameters of the relaxed bony pelvis.

In natural childbirth, there are several reflexes occurring normally at appropriate times.
The head of the newborn presents itself in the perineum.

After the birth of the newborn, the placenta and amniotic membranes are delivered. (paras 9-21 thru 9-23)

End of Lesson 9