

UNIT 12 - REPRODUCTIVE SYSTEM

LECTURE NOTES

12.01 GENERAL FUNCTIONS OF THE REPRODUCTIVE SYSTEM

- A. Production of offspring to continue the species.
- B. Sexual reproduction is the process by which genetic material is combined and passed from generation to generation.
- C. Produces and secretes hormones involved in the development and maintenance of the male and female reproductive organs as well as many other metabolic and physiological processes.
 - 1. Gonads
The organs (testes and ovaries) in the body which produce the sex cells and hormones.
 - 2. Gametes
Sex cells
 - a. Male
Testes produce sperm cells and the hormone testosterone.
 - b. Female
Ovaries produce ova or egg cells and the hormones estrogens and progesterone.

12.02 DESCRIBE THE ANATOMY OF THE MALE GENITALIA

- A. Testes:
 - 1. Description
The testes are the male gonads and are egg-shaped structures enclosed in a dense fibrous capsule called the tunica albuginea. They are suspended within the scrotum by the spermatic cord. The testes are divided into sections called lobules which contain the seminiferous tubules.
 - 2. Functions
 - a. Spermatogenesis or the production of sperm occurs in the seminiferous tubules.
 - b. Production of the male hormone testosterone occurs in the interstitial cells.

B. Epididymis

1. Description

The epididymis is an almond-shaped organ that lies along the posterior border of the testes. It consists mostly of a tightly coiled tube called the ductus epididymis which measures about 20 feet in length.

2. Function

It is the site of sperm maturation. The sperm receive fluids rich in fructose to assist with the development.

C. Ductus Deferens (Vas Deferens)

1. Description

The ductus deferens is a long duct (18 inches) which connects the epididymis to the ejaculatory duct posterior to the urinary bladder. The ductus deferens is composed of smooth muscle and is lined with epithelial tissue. The ductus deferens helps to form the spermatic cord and passes through the inguinal canal.

2. Function

The ductus deferens serves as a passageway for sperm from the epididymis to the urethra.

D. Seminal Vesicles

1. Description

The seminal vesicles are two tubular glands located on the posterior surface of the urinary bladder. They will unite with the ductus deferens to form the ejaculatory duct.

2. Function

The seminal vesicles produce an alkaline fluid rich in fructose to help nourish the sperm and neutralize the acid created by the sperm's waste products. It helps to form about 60% of the fluid or semen.

E. Ejaculatory Duct

1. Description

The ejaculatory duct lies posterior to the urinary bladder and is formed by the union of the duct from the seminal vesicle and the ductus deferens. It will lead into the urethra.

2. Function

The ejaculatory duct ejects sperm into the prostatic urethra just prior to ejaculation.

- F. Prostate Gland
1. Description
The prostate gland is a single donut-shaped gland about the size of a chestnut located inferior to the urinary bladder and surrounding the urethra. It is a common cancer site for adult males.
 2. Function
The prostate gland secretes a fluid rich in citric acid, prostatic acid, phosphates, and prostaglandins. It makes up 30% of the fluid found with sperm.
- G. Urethra
1. Description
The urethra is located at the base of the bladder, through the penis and ends at the urethral meatus. It measures about 8 inches in length.
 2. Function
The urethra serves as the passageway for urine or spermatozoa to the external environment, but not at the same time.
- H. Bulbourethral Glands (Cowper's Glands)
1. Description
The bulbourethral glands are pea-sized glands located inferiorly to the prostate gland on either side of the urethra.
 2. Function
The bulbourethral glands secrete an alkaline substance to neutralize the acidic environment of the urethra. The fluid is the first released during sexual stimulation to also help provide lubrication for sexual intercourse.
- I. Semen (Seminal Fluid)
- Semen is a mixture of sperm and the secretions of the seminal vesicles, prostate gland, and bulbourethral glands. The average volume of semen for ejaculation is 2.5 to 5 milliliters. There are about 50 to 150 million spermatozoa per milliliter of semen. If the semen contains less than 20 million spermatozoa per milliliter, the male is considered to be infertile or sterile.
- J. Scrotum
1. Description
The scrotum is a cutaneous sac of the abdomen consisting of loose skin, skeletal muscle, and superficial fascia.

2. Function
The scrotum encloses and protects the testes. It maintains a constant temperature about 2 to 3 degrees below normal body temperature for optimal sperm production.

K. Penis

1. Description
The penis is a cylindrical organ which surrounds the urethra. It consists of a body, root, and glans penis.
 - a. Body
The body is composed of three cylindrical masses of tissue each bound by fibrous tissue.
 - i. Corpora Cavernosa Penis: the two most dorsal and lateral masses of the penis.
 - ii. Corpus Spongiosum Penis: the smaller, mid ventral mass of the penis through which the urethra passes.
 - iii. All three masses are enclosed by fascia and skin and consist of erectile tissue permeated by blood sinuses.
 - iv. When sexual stimulation (visual, tactile, auditory, olfactory, and imagination) occurs, the arteries supplying the penis dilate and large quantities of blood enter the sinuses, and an erection occurs.
 - b. Root
The root is the portion of the penis attached to the pelvic area.
 - c. Glans Penis
The glans penis is made up of a slightly enlarged, distal end of the corpus spongiosum. It is separated from the body of the penis by a marginal area called the corona. It is covered by loose-fitting skin called the foreskin or prepuce.
2. Function
It conducts urine to the exterior and is the portion of the male anatomy used to introduce the sperm into the female vagina during intercourse.

12.03 IDENTIFY THE FUNCTIONS OF THE TESTES

The testes are responsible for production of sperm cell (spermatogenesis) and for the production of testosterone, the principle male hormone.

12.04 FUNCTIONS OF TESTOSTERONE

- A. Controls growth and development
- B. Maintenance of the male sex organs
- C. Stimulates bone growth
- D. Stimulates protein anabolism
- E. Responsible for closure of the epiphyseal plate
- F. Influences sexual behavior
- G. Supports final maturation of sperm
- H. Stimulates development of secondary male sex characteristics
 - 1. muscular and skeletal development
 - 2. development of pubic, axillary, and chest hair
 - 3. facial hair growth
 - 4. temporal hairline recession
 - 5. deepening of the voice

12.05 THE FEMALE REPRODUCTIVE SYSTEM

- A. Ovaries
 - 1. Description

The ovaries are the paired female gonads about the size and shape of almonds located within the pelvic cavity. There is an outer cortex and an inner medulla. The outer cortex contains follicles which support the ova or eggs.
 - a. Ovarian Follicles

Ovarian follicles contain oocytes (mature ova) and their surrounding tissues in various stages of development.
 - b. Vesicular Ovarian (Graafian) Follicle

The vesicular ovarian follicle is a large, fluid-filled follicle which contains an immature ovum and its surrounding tissue. It secretes the female hormones called estrogens.

- c. **Corpus Luteum**
The corpus luteum is the yellow, glandular body which develops from the vesicular ovarian follicle after the release of a secondary oocyte. It secretes the hormone progesterone.
- d. **Corpus Albicans**
The corpus albicans is the white, fibrous, connective tissue remnant of a degenerated corpus luteum.

2. **Functions**

The ovaries are responsible for producing eggs (ova) and hormones, including estrogens and progesterone.

B. **Uterine Tubes**

1. **Description**

The uterine tubes (Fallopian tubes or oviducts) measure about five inches in length. At one end, there is an expanded infundibulum or the funnel-shaped, open, distal end of the uterine tube near the ovaries. The infundibulum contains the fimbriae or finger-like projections at the end of the infundibulum to bring the ova, which have been released from the ovaries, into the uterine tubes.

2. **Functions**

The uterine tubes help to transport ova from the ovaries to the uterus. It is also the site of egg fertilization by a sperm.

C. **Uterus**

1. **Description**

The uterus is an inverted, pear-shaped, muscular organ located in the pelvic cavity. It is divided into three sections - the fundus, body, and the cervix.

- a. **Fundus:** the superior dome-shaped area the uterus above the openings to the uterine tubes.
- b. **Body:** the major, tapering, central portion of the uterus. It contains the hollow interior uterine cavity.
- c. **Cervix:** the narrow, thick muscular area that opens into the vagina. A common site of cancer in women.

The uterus also contains three layers. From the outer layer to the inner layer they are the perimetrium, the myometrium, and the endometrium.

- a. **Perimetrium:** the outermost layer of the uterus which provides a small amount of protection to the uterus.

The perimetrium is actually part of the visceral peritoneum.

- b. Myometrium: the middle, smooth muscle layer of the uterus. It makes up the majority of the uterus.
- c. Endometrium: the innermost layer of the uterus
 - 1. Stratum functionalis is the layer of the endometrium lining the uterine cavity which is shed during menstruation.
 - 2. Stratum basalis is the permanent, basement layer of the endometrium which functions to generate a new layer of the stratum functionalis following menstruation.

2. Function

The function of the uterus is to serve as the site of gestation or pregnancy for the developing embryo/fetus. The stratum functionalis, a layer of the endometrium, is shed monthly during menstruation.

C. Vagina

1. Description

The vagina is a tubular, fibromuscular organ lined with mucous membrane. It has several functional features including the fornix, rugae, vaginal orifice, and the hymen.

- a. Fornix: the proximal area in vagina that surrounds the vaginal attachment to the cervix.
- b. Rugae: transverse, connective tissue folds in the vagina.
- c. Vaginal orifice: the distal end of the vagina that opens into the external environment.
- d. Hymen: a thin fold of vascular mucus membrane that forms a border around the vaginal orifice partially closing it.

2. Functions

The vagina functions as passageway for the spermatozoa and the menstrual flow, as well as the lower portion of the birth canal. It also functions as a receptacle for the penis during sexual intercourse.

D. Vulva

The vulva is the term used to describe the external genitalia of the female.

1. Mons Pubis
The mons pubis is an elevation of adipose tissue covered by skin and coarse pubic hair.
 - a. Labia Majora: an area of lateral, longitudinal folds extending inferiorly and posteriorly.
 - i. Contains an abundance of adipose tissue, sebaceous glands, and sudoriferous glands
 - ii. Covered by pubic hair
 - iii. Homologous to the male scrotum
 - b. Labia Minora: the medial longitudinal folds of the vulva.
 - i. Very few sudoriferous glands
 - ii. No adipose tissue or pubic hair
 - iii. Numerous sebaceous glands
 - c. Clitoris: a small, cylindrical mass of nervous and erectile tissue.
 - d. Vestibule: the cleft between the labia minora.
 - i. Bulb of the Vestibule: two elongated masses of erectile tissue located on the sides of the vaginal orifice.
 - ii. Greater Vestibular Glands: glands on the sides of the vaginal orifice that produce a mucoid secretion that supplements lubrication during sexual intercourse.

E. Mammary Glands

1. Description

The mammary glands are actually modified sudoriferous (sweat) glands. Each gland consists of 15 to 20 lobes or compartments separated by adipose tissue. The amount of adipose tissue between the lobes determines the size of the breast. Breast size is not related to the ability to produce milk. Each lobe is broken down into smaller compartments called lobules which contain milk secreting glandular cells called alveolar glands (milk-producing glands of the breast). The areola is the dark, circular, pigmented area that encircles the nipple. The nipple is the raised area on the breast that an infant suckles to receive milk and stimulate lactation or the process of milk production, secretion, and ejection.

12.06 FUNCTIONS OF THE OVARIES

Ovaries are responsible for producing ova (eggs) and several hormones including estrogens, progesterone, and relaxin.

12.07 STRUCTURE AND FUNCTIONS OF THE UTERINE TUBES

1. Description
The uterine tubes (Fallopian tubes or oviducts) measure about five inches in length. At one end, there is an expanded infundibulum or the funnel-shaped, open, distal end of the uterine tube near the ovaries. The infundibulum contains the fimbriae or finger-like projections at the end of the infundibulum to draw the ova, which have been released from the ovaries, into the uterine tubes.
2. Functions
The uterine tubes help to transport ova from the ovaries to the uterus. It is also the site of fertilization.

12.08 UTERUS

1. Description
The uterus is an inverted, pear-shaped muscular organ located in the pelvic cavity. It is divided into three sections - the fundus, body, and the cervix.
 - a. Fundus: the superior dome-shaped area the uterus above the openings to the uterine tubes.
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The uterus also contains three layers. From the outer layer to the inner layer they are the perimetrium, the myometrium, and the endometrium.

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12.09 THE MENSTRUAL CYCLE

- A. Ovarian Cycle
The ovarian cycle is the monthly changes in the ovary associated with the maturation of an ovum.
- B. Menstrual Cycle
The menstrual cycle is the monthly changes in the endometrium of the uterus.
- C. Endocrine Influence
The changes associated with the ovarian cycle and the menstrual cycle in the female reproductive system are controlled by hormones.
 1. Hypothalamus
Produces and releases Gonadotropin Releasing Hormone (GnRH) which stimulates the pituitary gland to produce and release Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH).
 2. Anterior Pituitary Gland (Adenohypophysis)
 - a. FSH
Follicle Stimulating Hormone (FSH) stimulates the initial development of the ovarian follicles and secretion of estrogens by the follicles.
 - b. LH
Luteinizing Hormone (LH) stimulates further development of the ovarian follicles, stimulates ovulation, and the production of estrogens, progesterone, and relaxin by the ovarian cells of the corpus luteum.
 3. Ovaries
Ovaries produce the hormones estrogen, progesterone, and relaxin.
- D. Description of The Events
 1. The first day of the menstrual cycle is the day the period or menstrual flow is noted.

2. GnRH is released from the hypothalamus and stimulates the anterior pituitary gland to release FSH.
3. Under the influence of FSH, follicular development occurs within the ovaries. Some of the primordial follicles begin their development into primary follicles.
4. The follicular cells enlarge and multiply and release the estrogens.
5. The rising level of estrogens inhibits the production of GnRH from the hypothalamus which reduces the further amount of FSH being produced.
6. The amount of LH released from the anterior pituitary gland helps follicular development and maturation.
7. The amount of estrogen begins a sharp upturn which means a larger amount is being secreted. The endometrium starts to grow.
8. At about day 14, estrogen levels peak and the follicle is matured. This high estrogen level triggers a massive release of LH from the anterior pituitary gland which causes ovulation or the rupture of the follicular wall and the release of the ovum.
9. LH helps to stimulate the formation of the corpus luteum from the scar of the ruptured follicle.
10. The corpus luteum produces the hormone progesterone which helps to thicken the endometrium as well as increases the blood supply to that layer. This preparation gets the endometrium ready to receive a fertilized egg should conception occur.
11. Progesterone levels will stay high for approximately one week.
12. If conception does not occur, the corpus luteum begins to shrink in size and the level of progesterone drops.
13. The endometrium sloughs off during the period (menses or menstrual flow).

14. The release of GnRH from the hypothalamus stimulates the release of FSH and LH from the anterior pituitary gland. The ovarian follicles begin to develop and the cycle begins once again.

12.10 DESCRIBE THE EFFECTS OF ESTROGENS, PROGESTERONE, AND RELAXIN

- A. Estrogens:
 1. There at least 6 different types of estrogens.
 2. Responsible for the development and maintenance of the female reproductive system. Initiates the growth of the endometrium of the uterus.
 3. Helps control fluid and electrolyte balance.
 4. Maintains blood calcium levels and bone density.
 5. Increase protein anabolism.
 6. Body fat distribution associated with females (buttocks and thighs).
- B. Progesterone:
 1. Works in conjunction with estrogen to prepare the endometrial lining for implantation of a fertilized ovum.
 2. Stimulates milk secretion.
 3. Maintains the uterine linings during pregnancy..
- C. Relaxin:
 1. Produced by the corpus luteum during pregnancy.
 2. Most prominent during the final trimester of pregnancy.
 3. Relaxes the pubic symphysis.
 4. Helps dilate the uterine cervix to facilitate delivery of the fetus.

12.11 COMPARE SPERMATOGENESIS WITH OOGENESIS

Spermatogenesis and oogenesis are two process associated with meiosis. Meiosis is the specialized form of cell division which reduces the number of chromosomes in half. In humans, this means reducing the diploid (of full set) number of chromosomes (46) to the haploid number or 23. Meiosis only occurs in the gonads, the testes and ovaries.

- A. Spermatogenesis:

The formation of four haploid sperm cells in the male testes.
- B. Oogenesis:

The formation of a single haploid egg cell in the female ovaries. (The other 3 “eggs” become polar bodies and disintegrate)

12.12 EVENTS ASSOCIATED WITH HUMAN DEVELOPMENT

Human development is the continuous process of body changes that begin at the moment of fertilization and continue to the death of the individual.

A. Prenatal Development

Prenatal development describes all the changes that occur prior to birth. This is a dramatic period of rapid changes in which a single fertilized egg is transformed into a complex individual. It is divided into two periods: the embryo (from implantation to 8 weeks) and the fetus (from 8 weeks until birth).

B. Fertilization

Fertilization or conception is the union of a sperm cell with an oocyte (ovum). It occurs in the uterine tubes. It results in a diploid zygote, or a cell which contains 46 chromosomes. The first divisions of the zygote are called cleavage. Cleavage is a specialized form of mitosis in which the number of cells increases, but the overall size does not. It eventually forms a small ball sixteen cells called a morula.

C. Blastocyst

As the morula grows, it differentiates into a fluid-filled sac which has two sections.

1. The outer portion is trophoblast which differentiates into two layers -- the chorion and the amnion. The chorion eventually forms the placenta and the amnion forms a protective sac around the fetus.
2. The inner portion becomes the trophoblast.

D. Implantation:

1. The trophoblast contacts the endometrium about 6 days after fertilization and implants itself into the endometrium.
2. As implantation proceeds, the blastocyst differentiates into the endoderm, mesoderm, and ectoderm germ layers which will form the body systems.
3. Layers such as the chorion, amnion, and yolk sac begin to form around the embryo.
 - a. The chorion will form the placenta.
 - b. The amnion will form the fluid-filled sac or the amniotic sac.
 - c. The yolk sac provide some nutrients to the embryo until the placenta is fully formed and functional.

- E. Growth of the Embryo:
 - 1. The embryonic period begins at the time of implantation and continues until eight weeks.
 - 2. The embryonic period is marked by the formation of all major organs and organ systems. By the end of this time, the heart is pumping and brain waves are present.

- F. Growth of the Fetus:
 - 1. The fetal period begins eight weeks after fertilization.
 - 2. It is distinguished by ossification of the bones.
 - 3. It is marked by rapid growth of all organs and tissues by mitosis.
 - 4. The fetus is covered by soft white hair called lanugo and a waxy coat of epithelial cells (vernix caseosa) that protects the fetus from waste products in the amniotic fluid.
 - 5. A 38-week old fetus is considered full-term and ready for birth, although full term is considered to be 40 weeks.

12.13 THE THREE STAGES OF LABOR

Labor is the movement of the fetus through the birth canal in response to uterine contractions.

- A. First Stage - Dilation and Effacement of the Cervix
 - 1. Contractions of the myometrium increase in frequency and strength pushing the fetus against the cervix.
 - 2. Early in this period the amnion or water bag surrounding the fetus typically ruptures.
 - 3. The opening to the cervix dilates in response to pressure from the fetus.
 - 4. Positive feedback mechanisms promote stronger and more frequent contractions.
 - 5. Once the cervix thins and the opening dilates to 10 cm, the second stage of labor begins.

- B. Second Stage - Birth and Delivery
The fetus is pushed through the birth canal to the outside.

- C. Third Stage - Placental Expulsion
 - 1. Uterine contractions push the placenta out of the uterus.
 - 2. The uterus contracts to prevent bleeding.

12.14 DISEASES AND DISORDERS OF THE REPRODUCTIVE SYSTEM

A. Breast Cancer

Breast cancer is second only to lung cancer as the leading cause of cancer death among women in the United States. Breast cancer occurs in men also, but the number of new cases is small. Early detection and effective treatment is expected to reduce the number of women who die from breast cancer, and development of new methods of prevention continues to be studied. Risk factors of breast cancer include genetics, exposure to radiation, a high fat diet, and having the first baby after age 30. Breast cancer is generally found with routine breast self exams and mammograms. Treatment includes a lumpectomy or a mastectomy and may be followed with chemotherapy and/or radiation. Since the breast has so many lymph nodes nearby, the chances of metastasis are high involving other organs such as the brain, lung, intestines, bone, and liver.

B. Testicular Cancer

Testicular cancer accounts for only 1 percent of all cancers in men. About 7,500 men in the United States are diagnosed with testicular cancer each year. Testicular cancer occurs most often in men between the ages of 15 and 39, and is the most common form of cancer in men between the ages of 20 and 34. It is more common in white men than in black men. Most testicular cancers are found by men themselves. Also, doctors generally examine the testicles during routine physical exams. Between regular checkups, if a man notices anything unusual about his testicles, he should talk with his doctor. Men should see a doctor if they notice any of the following symptoms: a painless lump or swelling in the testicle, a feeling of heaviness in the scrotum. A man should see his health care provider immediately. Treatment includes an orchiectomy which may be followed by chemotherapy.

C. Cervical Cancer

Cervical cancer is cancer of the uterine cervix. There are several factors which increase a woman's chances including genetics, age, the presence of HIV, age, multiple sexual partners, use of birth control pills, infection with the human papilloma virus, and smoking. The symptoms of cervical cancer include no symptoms, a vague feeling of bloating, increased vaginal discharge, pelvic pain, and abnormal vaginal bleeding. Treatment includes surgery, chemotherapy and/or radiation.

D. Ovarian Cancer

Ovarian cancer is cancer of the ovaries and is the seventh most common cancer and the fifth leading cause of cancer death after lung, breast, colorectal, and pancreatic. The risk factors include genetics, age, and other unknown causes. Symptoms of ovarian cancer are fairly vague including bloating and abdominal pain which makes diagnosis difficult since women do not generally see their health care providers for those symptoms. There is a blood test, CA 125, available which is used for women with a familial history of ovarian cancer. Treatment includes surgery and/or chemotherapy.

E. Prostate Cancer

Prostate cancer is the cancer of the prostate and is the second most common form of cancer among men in the United States. It is the second cause of cancer death in men and the sixth leading cause of death of men overall. The two most commonly used tests to diagnose prostate cancer include a physical examination and blood test called the PSA. Treatment includes surgery, and well as radiation and/or chemotherapy.

G. Endometriosis

Endometriosis is the presence of the endometrium outside of the uterus. It affects over 5 million women in the United States. The cause of endometriosis seems to be the backflow of menstrual blood. The symptoms include very painful period, heavy periods, chronic abdominal pain, and usually infertility. It may be controlled by the use of birth control pills and surgery may be required to remove the endometrial tissue from organs where it does not belong.

H. Impotence

Impotence, otherwise known as Erectile Dysfunction or ED. Impotence," is the repeated inability to get or keep an erection firm enough for sexual intercourse. The word "impotence" may also be used to describe other problems that interfere with sexual intercourse and reproduction, such as lack of sexual desire and problems with ejaculation or orgasm. Using the term erectile dysfunction makes it clear that those other problems are not involved. Impotence is generally treated with counseling and with medications.

I. Gonorrhea

Gonorrhea is a sexually transmitted disease of the reproductive and urinary systems caused by the bacterium *Neisseria gonorrhoea*. Over 2 million cases are reported in the United States each year. It is prevalent among young people, ages 15 and 25, and persons with multiple sexual partners. Transmission almost exclusively follows sexual contact with an infected person. Newborns of infected mothers can contract the bacteria in their eyes when they pass through the vagina during delivery. Many

males have no symptoms. Some males will develop painful urination and a greenish-yellow discharge from the urethra. Females usually have no symptoms except a greenish-yellow discharge from the cervix, painful urination and abdominal tenderness. Gonorrhea can spread and infect the joints and the heart. The symptoms appear between three days and three weeks after infection. In females, it can cause pelvic inflammatory disease and sterility. Treatment is with an antibiotic, such as penicillin. Re-infection is common. Condoms can decrease the risk of transmission, but are not 100% effective. There are numerous strains of the bacteria that are resistant to penicillin and other antibiotics must be considered. Newborns receive antibiotic ointment in their eyes immediately after birth to prevent complication of the bacteria, such as blindness.

J. Syphilis

Syphilis is a chronic, infectious sexually transmitted disease that begins in the mucous membranes and spread throughout the body by the bloodstream. The untreated disease is characterized by progressive stages: primary, secondary, latent and late. The incidence is highest in persons between ages 15 and 39. There are more than 50,000 cases of syphilis in the United States annually. The cause of infection is a bacterium known as *Treponema pallidum*. Transmission occurs primarily through sexual contact but can be spread from a pregnant mother to her fetus. Primary syphilis is characterized by the presence of small, fluid-filled lesions or chancres on the genitalia. The lesions may be found on other parts of the body such as fingers and eyelids. The lesions will go away even if treatment is not sought. Primary syphilis is highly contagious. Secondary syphilis occurs several days or weeks after the onset of primary syphilis. Lesions appear on the trunk, arms, legs, scrotum and vulva. This stage is highly contagious. Latent syphilis is the next stage and is characterized by no outward symptoms. The bacterium continues to infect the body's internal organs. It is also a contagious stage. The last stage is the final stage. The bacteria may have attacked the liver, brain, bone marrow, stomach, lungs, spleen and brain. This phase results in death.

K. Genital Herpes

Genital herpes is an infection of the reproductive system cause by the herpes simplex II virus. The infection is the most commonly recurring of the sexually transmitted diseases. It is primarily transmitted through sexual contact. The infection can be passed to newborns by infected mothers during delivery. Signs of infection include a fluid-filled vesicle on the genitalia. The vesicles will rupture and develop into painful ulcers with characteristic yellow oozing centers. Treatment is with a drug known as Zovirax.

L. Chlamydia

Chlamydia is the most common sexually transmitted disease in the United States, afflicting millions of people annually. The cause is a bacterium known as *Chlamydia trachomatis*. The bacterium affects the reproductive, urinary, and lymphatic systems. Males and females may or may not show signs of infection. The primary lesion is a painless vesicle on the skin that often goes unnoticed. In males, the infection can lead to infection of the epididymis, prostate and the urethra. Pain and infectious discharge can result. In females, chlamydia can result in infection of the uterine tubes and the pelvis resulting in sterility. Treatment is with an antibiotic such as tetracycline. Condoms can decrease the risk of transmission, but are not 100% effective. Re-infection can occur especially if the patient does not finish their course of antibiotic therapy.

M. Trichomoniasis

Trichomoniasis is an infection of trichomonas. Trichomonas is a parasitic protozoon which may cause a vaginal infection resulting in increased foul-smelling vaginal discharge along with itching and burning of the vulva. It is treated with anti-fungal medication.

N Genital Warts

Genital warts are transmitted sexually through contact. The warts appear on the genitalia in warm, moist surfaces such as in the urethra of males and on the vulva, vagina and cervix of females. The painless warts start as tiny red swellings that grow and spread. The warts often look like cauliflower. Treatment includes medication such as benzoin or surgery. Re-infection is possible.

O. Human Papilloma Virus

Human papilloma virus is also called HPV. It is a virus that includes more than 100 types, over 30 of which are sexually transmitted. The types of HPV that infect the genital area are known as genital HPV. Most sexually active people will have HPV at some point in their lives, though most will never know it because it usually has no symptoms and goes away on its own. Genital HPV is one of the most common sexually transmitted diseases in the United States. At least 50 percent of sexually active men and women get genital HPV at some time in their lives. High-risk types can cause changes that can lead to cervical cancer over time, if left untreated. Having high-risk HPV is not the same as having cervical cancer. Usually, these high-risk HPV types cause no health problems at all and go away on their own. Persistent high-risk HPV (infection that does not go away) is the most important risk factor for cervical cancer. The good news is that cervical cell changes can be found with regular Pap tests, and treated to prevent cervical cancer from ever developing. There is no treatment or cure for HPV.