

Component I: Core

Module B: Terminology, Anatomy and Physiology

Topic 13: Reproductive System

Statement of Purpose

To prepare the learner with basic knowledge of the reproductive system.

Student Learning Outcomes

Upon completion of this topic, the learner will be able to:

1. Spell and define the key terms.
2. List male secondary sex characteristics.
3. Describe the male reproductive system on an anatomical illustration.
4. Describe the pathway of sperm from production to ejaculation.
5. Describe the female reproductive system on an anatomical illustration.
6. Explain how fertilization occurs during coitus.
7. List female secondary sex characteristics.
8. Explain the phases and purpose of the menstrual cycle.
9. Describe male reproductive hormones.
10. Describe female reproductive hormones.

Terminology

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|---|--------------------------|
| 1. Adam's apple | 25. Ovaries |
| 2. Bulbourethral glands | 26. Ovum |
| 3. Cervix | 27. Ovulation |
| 4. Coitus | 28. Penis |
| 5. Conception | 29. Placenta |
| 6. Corpus luteum | 30. Prostaglandins |
| 7. Endometrium | 31. Pregnancy |
| 8. Epididymis | 32. Progesterone |
| 9. Ejaculation | 33. Prostate |
| 10. Ejaculatory duct | 34. Pubic hair |
| 11. Fallopian tubes | 35. Scrotum |
| 12. Fertilization | 36. Semen |
| 13. Fimbriae | 37. Seminiferous tubules |
| 14. Follicular phase | 38. Seminal vesicles |
| 15. Follicle Stimulating Hormone (FSH) | 39. Spermatogenic cells |
| 16. Genitalia | 40. Spermatoid |
| 17. Gonadotropin-releasing hormone (GnRH) | 41. Spermatozoon |
| 18. Infundibulum | 42. Sperm |
| 19. Luteal phase | 43. Testes |
| 20. Luteinizing hormone (LH) | 44. Testosterone |
| 21. Mammary glands | 45. Urethra |
| 22. Menstruation | 46. Uterus |
| 23. Nucleus | 47. Vagina |
| 24. Oogenesis | 48. Vas deferens |
| | 49. Zygote |

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Websites

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Content Outline/Theory Objectives	Suggested Learning Activities
<p>Objective 1 Spell and define key terms.</p> <ul style="list-style-type: none"> A. Review the terms listed in the terminology section. B. Spell the listed terms accurately. C. Pronounce the terms correctly. D. Use the terms in their proper contexts. 	<ul style="list-style-type: none"> A. Games: word searches, crossword puzzles, Family Feud, Jeopardy, bingo, spelling bee, hangman and concentration. B. Administer vocabulary pre-test and post-test. C. Discuss learning gaps and plan for applying vocabulary.
<p>Objective 2 List male secondary sex characteristics.</p> <ul style="list-style-type: none"> A. Longer, heavier bone structure. B. Larger muscles and strength. C. Deep voice, large Adam's apple. D. Growth of body hair. E. Development of the genitalia. F. Increased metabolism. G. Sexual desire increases. 	<ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Use anatomical diagrams/posters/videos/computer assisted learning/ workbook activities.
<p>Objective 3 Describe the male reproductive system on an anatomical illustration.</p> <ul style="list-style-type: none"> A. Testes <ul style="list-style-type: none"> 1. Two primary organs of the male reproductive system. 2. Produces sperm and secretes testosterone. 3. Scrotum holds testicles and regulates temperature. 4. Testes have two lobes with seminiferous tubules. 5. Seminiferous tubules are filled with spermatogenic cells. 6. Sperms are produced from the spermatids. 7. Testosterone is the male hormone produced in the testes. B. Epididymis <ul style="list-style-type: none"> 1. Sit on top of each testis. 2. Coiled tubes that receive spermatids. 3. Sperms, coming from spermatids, mature inside the epididymis. C. Vas deferens <ul style="list-style-type: none"> 1. Connected to the epididymis. 2. Carry the sperm from the epididymis to the urethra. 3. Tube cut when male has a vasectomy. D. Seminal vesicles 	<ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Use anatomical diagrams/posters/videos/computer assisted learning/ workbook activities. D. List and describe each of the sex organs on a handout with pictures of a model of male anatomy.

<ol style="list-style-type: none"> 1. Two main glands located at the base of the bladder that opens into the vas deferens. 2. The glands secrete a thick fluid, which forms part of the semen. <p>E. Prostate gland</p> <ol style="list-style-type: none"> 1. Encircles the upper end of the urethra. 2. Secretes a fluid that aids in the movement of the sperm and ejaculation. <p>F. Bulbourethral glands</p> <ol style="list-style-type: none"> 1. Inferior to the prostate gland. 2. Secretions before ejaculation into the urethra that lubricates the end of the penis before intercourse. <p>G. Urethra</p> <ol style="list-style-type: none"> 1. Lowest part of the urinary tract through which urine passes from the urinary bladder to the outside of the body. <p>A. Penis</p> <ol style="list-style-type: none"> 1. Male organ of urination and copulation. 	
<p>Objective 4 Describe the pathway of sperm from production to ejaculation.</p> <ol style="list-style-type: none"> A. Sperm develops and matures in testicular tubes known as seminiferous tubules. B. Spermatogenesis is the process of sperm cell formation. C. After development, sperm are released into tubules of the testes. D. Sexual arousal causes stimulation of the seminal vesicles producing secretions. E. Release of sperm occurs through the pathway: <ol style="list-style-type: none"> 1. Epididymis – coiled tube that receives spermatids as cells are formed, to become mature sperms. 2. Vas deferens – tube connected to each epididymis carrying sperms to the urethra. 3. Seminal vesicles – sac-like organs that secrete alkaline fluid rich in sugars and prostaglandins <ol style="list-style-type: none"> a. Sugars are used to make energy. b. Prostaglandins stimulate muscular contractions in the female reproductive system, propelling the sperm forward. 4. Ejaculatory ducts - union of the vas deferens and the duct of the seminal vesicle. 5. Prostate gland <ol style="list-style-type: none"> a. Surrounds the proximal portion of the urethra. b. Creates a milky, alkaline fluid, secreting it into the urethra just before ejaculation. c. Fluid helps to protect the sperm when it enters the female reproductive system. 6. Urethra 	<ol style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Use anatomical diagrams/posters/videos/computer assisted learning/workbook activities.

Objective 5

Describe the female reproductive system on an anatomical illustration.

A. Ovaries

1. Primary sex organs of the female.
2. Produce the sex cells (eggs) of the female.
3. Produce estrogen and progesterone.
4. Two ovaries in most women.
5. Oval shaped and located in the pelvic cavity.
6. Divided into an inner area called the medulla and outer area called the cortex.
7. The medulla contains nerves, lymphatic vessels and many blood vessels.
8. Cortex contains small masses of cells called ovarian follicles.
9. Covered by epithelial tissue and dense connective tissue.
10. Oogenesis is the process of egg cell formation.

B. Fallopian tubes (uterine tube)

1. Internal accessory organ.
2. Opening near each ovary, with an expanded opening.
3. The expanded opening is called infundibulum and fimbriae.
4. Both infundibulum and fimbriae function to catch an ovum as it leaves the ovary.
5. Fallopian tubes are lined with ciliated cells that sweep the ovum toward the uterus.

C. Uterus

1. A hollow, muscular organ that functions to receive an embryo and sustain its development.
2. The top of the uterus is called the fundus.
3. Upper two thirds are called the body.
4. The narrow, lower portion that extends into the vagina is called the cervix.
5. There are three layers to the walls
 - a. Endometrium – innermost lining that contains numerous tubular glands which secrete mucus.
 - b. Myometrium – middle thick, muscular layer.
 - c. Perimetrium – thin layer that covers the myometrium and secretes serous fluid that coats the uterus.

D. Vagina

1. Tubular organ that extends from the uterus to the outside of the body.
2. Functions to receive an erect penis during sexual intercourse.
3. Provides open passageway for uterine secretions and offspring.

A. Lecture/Discussion**B. Assigned Readings****C. Use anatomical diagrams/ posters/videos/computer assisted learning/ workbook activities.****D. List and describe each of the sex organs on a handout with pictures of the female anatomy.**

<ol style="list-style-type: none"> 4. Opening is posterior to the urinary opening and anterior to the anal opening. 5. Wall has three layers <ol style="list-style-type: none"> a. Innermost mucosal layer – secretes mucus. b. Rugae - the transverse ridges on the mucous membrane lining the vagina. They allow the vagina to stretch during childbirth. c. Middle layer - muscular layer. d. Outermost - fibrous layer. 	
<p>Objective 6 Explain how fertilization occurs during coitus.</p> <ol style="list-style-type: none"> A. Ovum expelled from ovary. B. Ejaculated semen with sperm is deposited into vagina <ol style="list-style-type: none"> 1. Sperm travels deep into female vagina to fallopian tube. 2. This is location of mature ovum or egg. C. Sperm surrounds the egg <ol style="list-style-type: none"> 1. Sperm release an enzyme which eventually exposes an area of ovum membrane to sperm penetration. 2. Only one spermatozoon penetrates the ovum. D. Nucleus of sperm moves and combines with the nucleus of the egg. E. The fertilized egg is now called a zygote. 	<ol style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Use anatomical diagrams/posters/videos/computer assisted learning/workbook activities.
<p>Objective 7 List female secondary sex characteristics.</p> <ol style="list-style-type: none"> A. Mammary glands or breasts grow and mature. B. Broadening of the pelvis. C. Smaller bones than males. D. Softer and smoother skin. E. Pubic hair and other body hair growth. F. Fat deposits in breasts, thighs and buttocks. G. Sexual desire increases. 	<ol style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Use anatomical diagrams/posters/videos/computer assisted learning/workbook activities.
<p>Objective 8 Explain the phases and purpose of the menstrual cycle.</p> <ol style="list-style-type: none"> A. Follicular phase <ol style="list-style-type: none"> 1. Pituitary gland secretes high levels of follicle stimulating hormone (FSH) to stimulate ovarian follicles. 2. Follicle continues to move toward the surface of the ovary as the egg matures. 3. Endometrium has been stimulated and uterus has grown a thick lining in preparation for 	<ol style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Use anatomical diagrams/posters/videos/computer assisted learning/workbook activities.

Objective 9 Describe the male reproductive hormones. <ul style="list-style-type: none"> A. Hypothalamus, anterior pituitary gland and the testes secrete hormones that regulate male reproductive functions. B. Gonadotropin-releasing hormone (GnRH) stimulates anterior pituitary gland to release follicle stimulating hormone (FSH) and luteinizing hormone (LH). C. FSH stimulates interstitial cells to produce testosterone. D. Testosterone stimulates the development of male secondary sex characteristics. 	<ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Use anatomical diagrams/posters/videos/computer assisted learning/workbook activities.
Objective 10 Describe the female reproductive hormones. <ul style="list-style-type: none"> A. Onset of puberty, the hypothalamus secretes increasing amounts of GnRH. B. Causes the pituitary gland to release FSH and LH. C. LH and FSH stimulate the ovary to produce estrogen and progesterone. 	<ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Use anatomical diagrams/posters/videos/computer assisted learning/workbook activities.