



AFCDA01 Hall/Raff

4N051, Module 6, Major Organs and Systems Lesson 3- Other Systems of the Human Body



Other Systems of the Human Body

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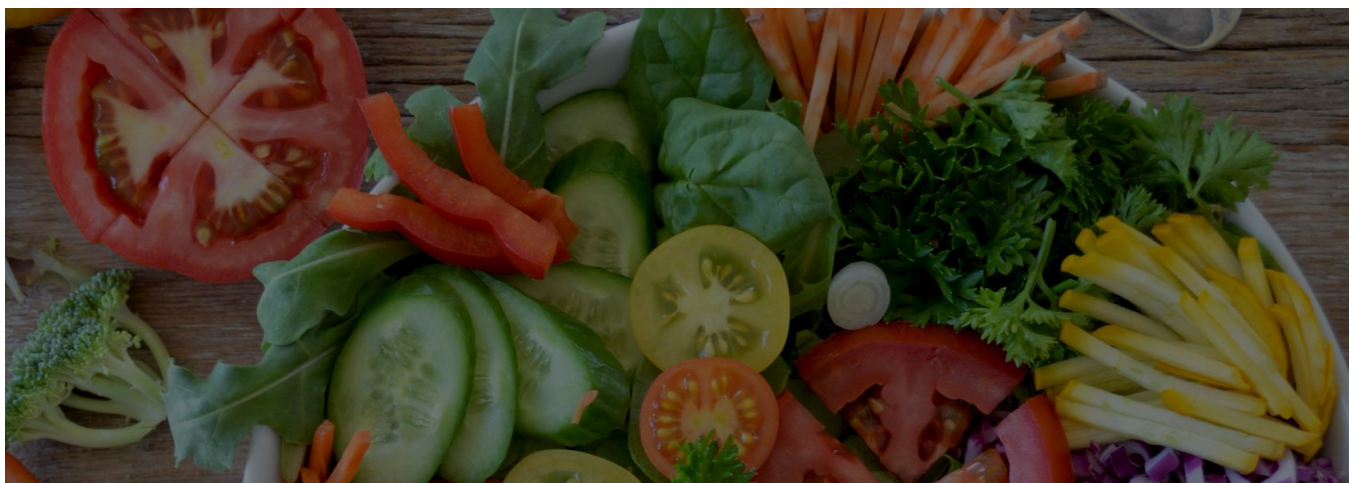


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After completing this lesson, the student will be able to identify other human body system principles in accordance with prescribed guidance and publications.

The Digestive System

The digestive system is composed of organs that process the body's nutritional needs through the breakdown of food, distributes nutrients to the body and assists in the elimination of waste products.





The digestive system can be divided into two areas, the alimentary canal and the accessory organs.

The alimentary canal is a muscular tube that is approximately 30 feet long. It begins from the mouth and extends through to the anus. It consists of four layers: the serous is the outer layer, made up of epithelial and connective tissues helping secretions to occur. It also keeps the tube lubricated so organs in the abdominal cavity can slide easily against each other. The second layer is muscular, consisting of two coats of smooth muscle tissue. This layer is responsible for the movement of substances in the alimentary canal. The submucosa, the third layer, contains blood vessels, nerves, glands and lymphatic vessels. Lastly, the mucous membrane is the inner lining that assists in both the absorption and secretion digestive processes.

The mouth receives food and begins the process of digestion. Within the mouth are the teeth, tongue, palate, cheeks and lips. The space within the mouth between the palate and tongue is called the oral cavity. An additional space, located between the cheeks and teeth, is known as the vestibule. Included in the mouth are many small salivary glands located in the tongue, palate and cheeks. The teeth develop within sockets located in both the mandible (lower jaw) and maxilla (upper jaw). Humans have two sets of teeth that develop during their lifetime. The first set, known as the primary or deciduous teeth, erupt at regular intervals between the ages of six months and four years. There are 20 deciduous teeth (10 in the mandible and 10 in the maxilla). As the secondary (permanent) teeth develop, they push the deciduous teeth out of their sockets. There are 32 permanent teeth (16 in each jaw).

Watch the two videos throughout this section to learn more about the digestive system.



Digestive System Part 1 Crash Course Anatomy & Physiology Transcript.pdf

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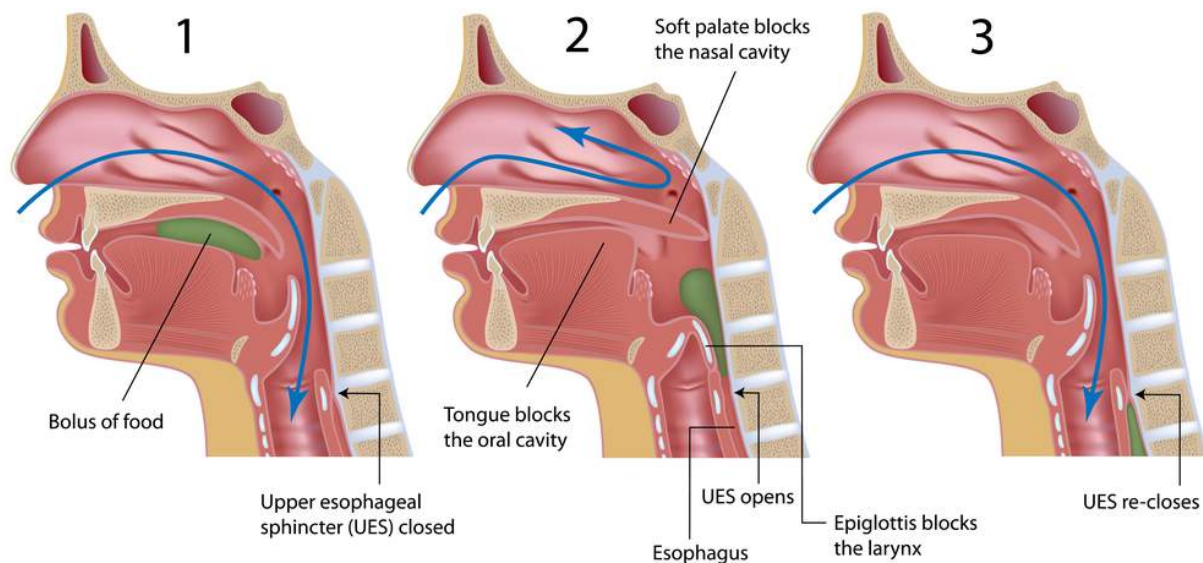


The tongue, made up of intrinsic and extrinsic skeletal muscles, is a large muscular structure, located on the floor of the mouth. The intrinsic muscle fibers enable the tongue to change size and shape while the extrinsic muscles enable the up, down or sideways movement within the

mouth. The tongue is attached to the floor of the mouth by a fold of mucous membrane called the frenulum. The tongue is covered by a mucous membrane, which has little projections called papillae along its superior surface which provides friction to hold food on the tongue. Additionally, these papillae contain taste buds that stimulate the salivary and gastric glands. The pharynx is a cavity located posterior to the mouth, serving as a passageway from the mouth to the esophagus.

The pharynx is divided into three parts: nasopharynx, oropharynx, and laryngopharynx. The nasopharynx is above the palate and provides a passageway for air during respiration. The eustachian tube from the middle ear passes through the nasopharynx and connects with the pharynx. The oropharynx is behind the palate and extends downward toward the epiglottis functioning as a passageway for food and air. The laryngopharynx is below the oropharynx extending from the epiglottis to the larynx, where it joins with the esophagus. The esophagus is a straight, muscular tube approximately 10 inches long. It extends from the pharynx to the stomach and is located posterior to the trachea. A portion of the esophagus penetrates the diaphragm through an opening called the esophageal hiatus.

Swallowing



The stomach is a hollow, muscular organ approximately 10–12 inches long with the ability to hold 1 liter or more of contents. The stomach is located below the diaphragm in the upper left quadrant of the abdominal cavity. The inner lining of the stomach contains many small openings called gastric pits, which are the open ends of many tubular gastric glands. With the stomach consisting of four regions, the cardiac region is near the esophagus. At the point where the esophagus joins with the stomach there is a muscular valve known as the cardiac sphincter. The fundic region extends above the cardiac region and is a temporary storage area for food while sometimes filling with swallowed air. This swallowed air creates a gastric air bubble, which is often used as a landmark for abdominal x-rays. The body region is the main part of the stomach located between the fundic and pyloric regions.

Lastly, the pyloric region becomes narrow and joins with the small intestine. A muscular valve, called the pyloric sphincter, is located between the pyloric region and the small intestine. The small intestine is a tubular organ approximately 18 to 20 feet long extending from the pyloric sphincter to the large intestine and coils throughout most of the abdominal cavity. The small intestine is divided into three separate portions, the duodenum, jejunum and ileum. The duodenum is the shortest portion of the small intestine. It joins with the pyloric sphincter and then extends into the jejunum. The jejunum is the middle portion. Lastly, the ileum connects to the large intestine through a valve known as the ileocecal valve.

The large intestine is approximately 5 feet long and has four portions: the cecum, colon, rectum, and anal. The cecum connects with the ileocecal valve of the small intestine, one end extending downward to a closed end of the large intestine, the appendix. The other end of the cecum connects to the second portion of the large intestine, the colon. The colon is divided into four distinct portions that are named according to their location in the abdominal cavity. The first portion of the colon is the ascending colon, which extends upward through the right lower quadrant. It then becomes the transverse colon as it travels across the abdominal cavity.

The transverse colon then turns downward through the left lower quadrant to become the third portion, which is called the descending colon. The descending colon makes an S-shaped curve and then becomes the final part, which is known as the sigmoid colon. The sigmoid colon then joins with the third portion of the large intestine, the rectum. Rectum extends below the tip of the coccyx and leads to the final portion of the large intestine, the anal canal. Anal canal is actually the last 1 to 1½ inches of the large intestine. The anal canal extends to the outside of the

body through an opening called the anus. The two muscles that protect this opening are the internal anal sphincter and the external anal sphincter. The internal anal sphincter is composed of smooth muscle and is under involuntary control. The external anal sphincter is composed of skeletal muscle and is under voluntary control.



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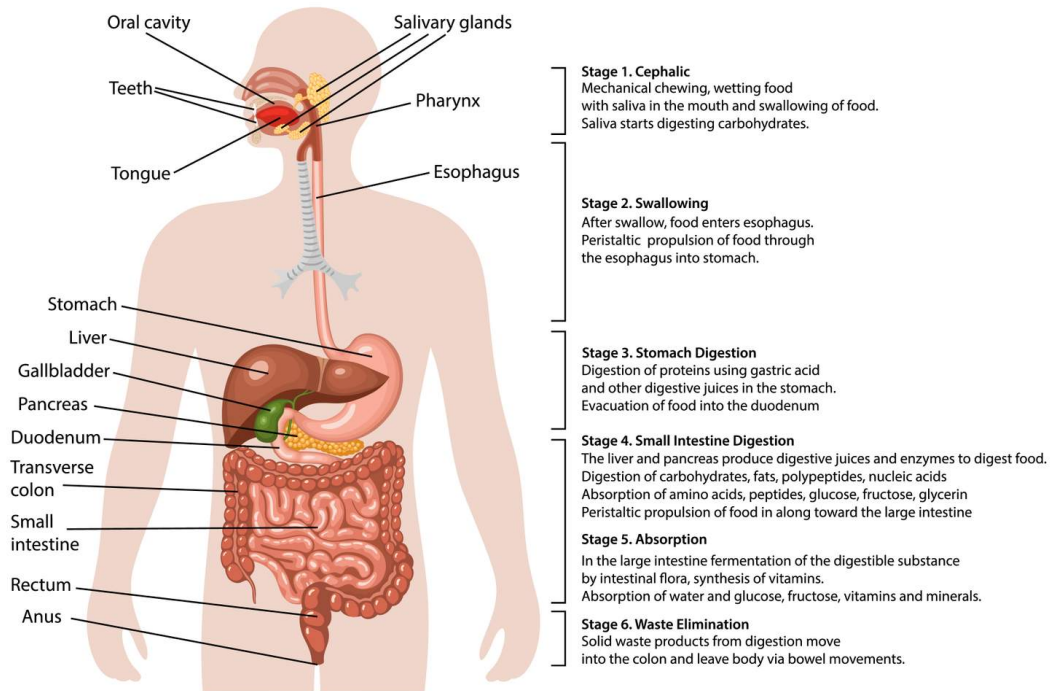


The pancreas, liver, and gallbladder serve as accessory organs of the digestive system. The pancreas is located in the central portion of the abdomen, between the duodenum and the spleen. A duct, known as the pancreatic duct, extends into the duodenum. Most of the liver is located in the right upper quadrant (RUQ) of the abdomen extending toward the center of the

abdominal cavity just below the diaphragm. Veins from the digestive system lead to the liver and ducts lead from the liver to the gallbladder. The gallbladder is a small, pear-shaped organ located along the inferior surface of the liver. It has a capacity to hold approximately 30 to 50 milliliters of fluid. Ducts lead from the gallbladder to the duodenum.

Digestion is the process by which food is broken down mechanically and chemically for use by the body. The process of digestion begins in the mouth and is completed when solid waste products are expelled from the body. In the mouth, large food particles are mechanically reduced in size by the teeth through chewing. Taste buds connect to nerve endings to transmit the sensations of sweet, salty, sour, and bitter to the brain. The salivary glands in the mouth secrete saliva to moisten the food to facilitate swallowing. Swallowing is accomplished as the tongue pushes the food back into the pharynx. The pharynx then contracts and pushes the food into the esophagus. Involuntary muscle contractions, peristalsis, of the esophagus move the food toward the stomach. Once the food enters the stomach, the cardiac sphincter valve prevents the food from pushing up into the esophagus.

Stages of Digestion



The stomach muscles churn the food reducing its size as gastric juices are secreted and mixed with the food. The result is a semiliquid substance called chyme which is then pushed from the stomach through the pyloric sphincter valve and into the duodenum of the small intestine. Once the chyme is in the duodenum, bile, produced by the liver and stored in the gallbladder, is added. Additional juices from both the pancreas and small intestines are also added. All of the digestive juices further break down the chyme through chemical actions. The villi that line the intestines assist in movement and absorption of the contents of the small intestines.

Peristalsis causes the chyme to continue through the jejunum and ileum. During this process, the villi that line the small intestines absorb nutrients from the chyme passing to capillaries, making it possible for the nutrients to enter the circulatory system for distribution throughout the body. Undigested chyme passes from the ileum in the small intestines to the cecum in the large intestines, where peristalsis continues to move the chyme. The colon absorbs water for

the remaining waste to pass through the colon and into the rectum. Finally, the feces are expelled from the body through the anal canal.

Multiple Choice

During what phase of digestion does food enter the esophagus?

- ☐ Cephalic
- ☐ Swallowing
- ☐ Absorption
- ☐ Waste Elimination

SUBMIT



Complete the content above before moving on.

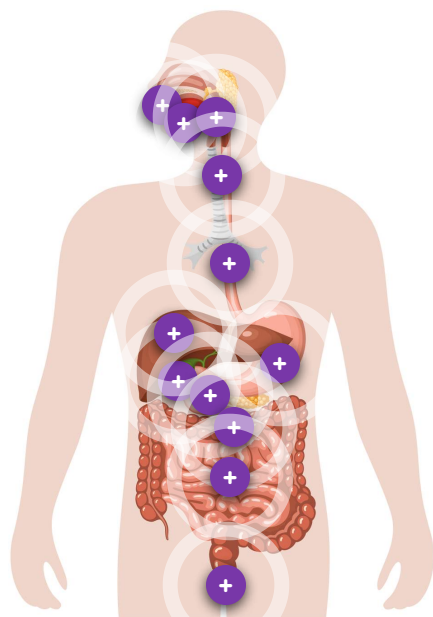


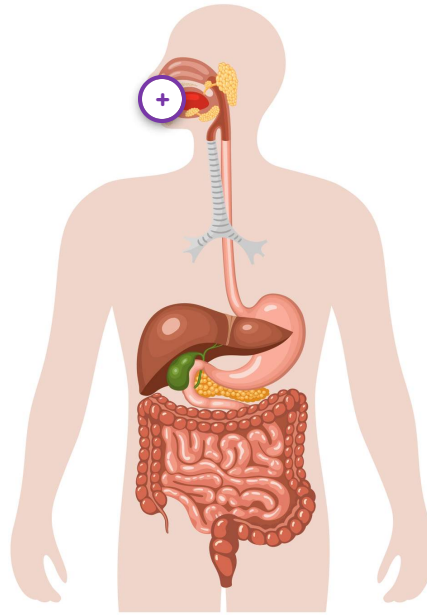
**Digestive System Part 3 Crash Course Anatomy & Physiology
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Click each of the hotspots below to learn more about the
organs associated with digestion.





Teeth

Humans are diphyodont i.e., they have two sets of teeth– milk or deciduous and permanent teeth. Here is the list of different types of teeth in humans with their functions.

Type of Teeth and Function

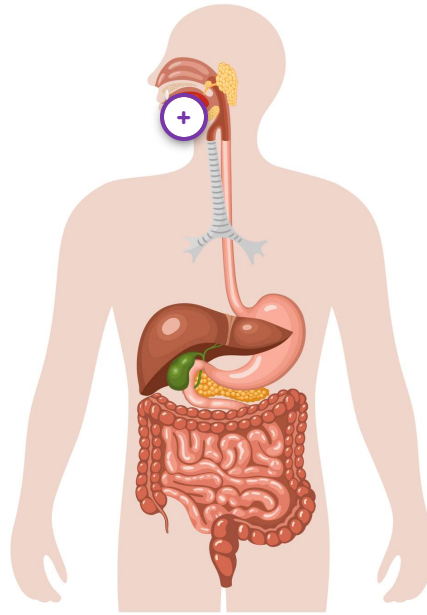
Incisors Used for cutting

Canines Used for tearing

Premolars Used for chopping

Molars Used for grinding and chewing

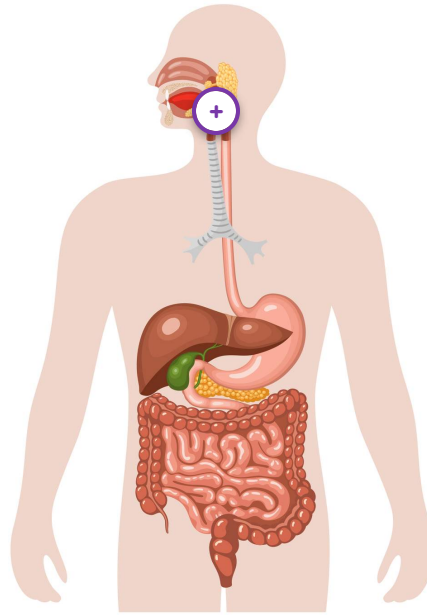
The structure of the tooth is made up of three parts– the crown, neck, and root. The exposed part of the tooth is called the crown, the region where it is covered with gums is known as neck and root is embedded in the socket of the jaw bone (Thecodont).



Mouth

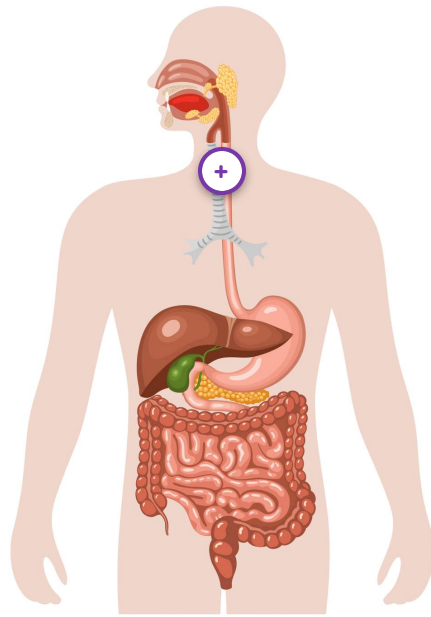
The mouth is the first part of our digestive system. Food is ingested through the mouth. The oral cavity comprises the palate, tongue and teeth.

The palate is the roof of the oral cavity and the tongue is a muscular and glandular structure attached to the base of the oral cavity. The upper surface of the tongue has tiny projections known as lingual papillae. Lingual papillae are of three types: circumvallate, fungiform and filiform.



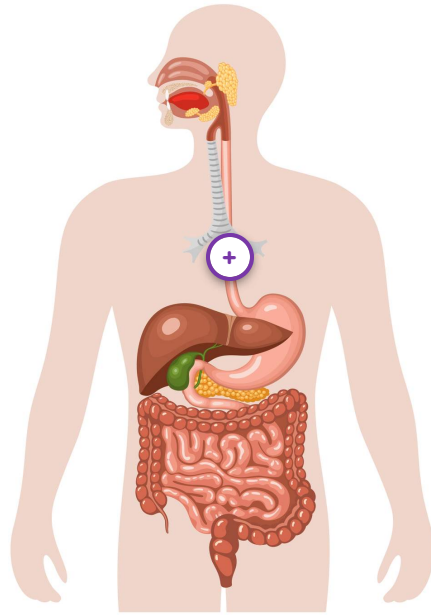
Salivary Glands

Salivary glands: The salivary glands are exocrine glands that produce saliva through a system of ducts. Humans have three paired major salivary glands (parotid, submandibular, and sublingual), as well as hundreds of minor salivary glands. An average person produces between 0.5 and 1.5 liters of saliva every day.



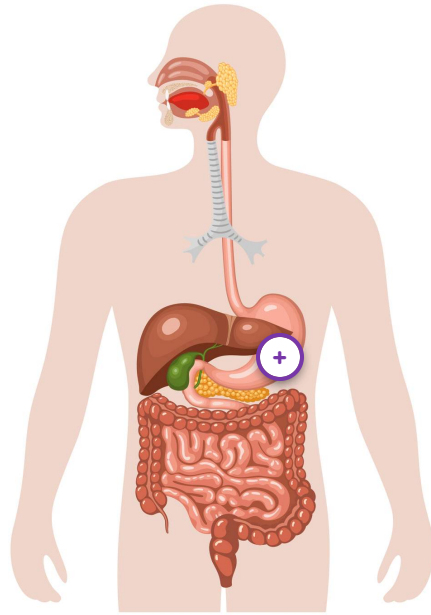
Pharynx

It is the common passage for food and air. Epiglottis is what prevents the entry of food into the windpipe.



Esophagus

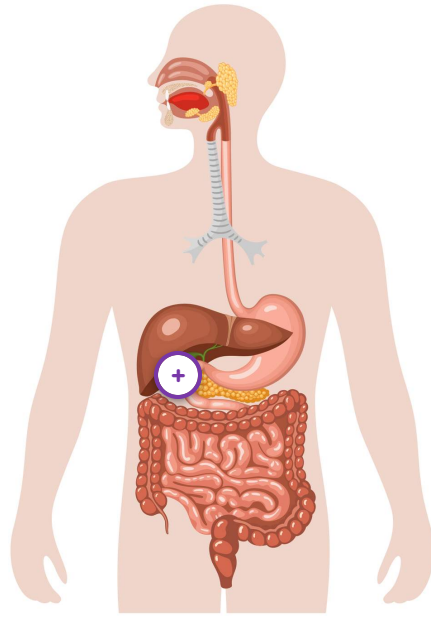
It is a muscular tube through which small bolus of food passes from the mouth to the stomach. The gastro-esophageal sphincter controls the movement of food into the stomach.



Stomach

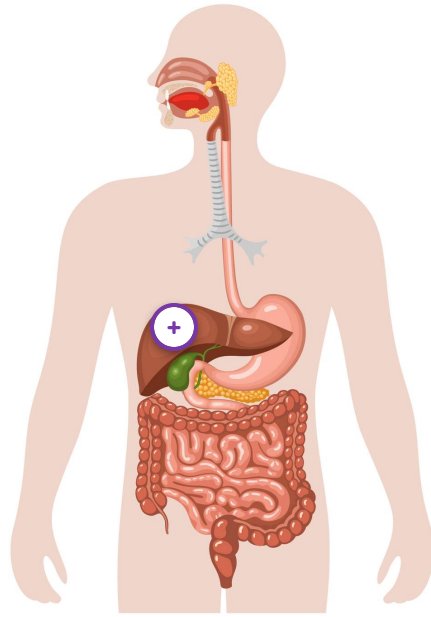
It is a muscular bag, positioned at the upper left part of the abdominal cavity. It has four parts– cardiac, fundus, body and pyloric portion.

1. Cardiac part– It is present close to the heart. The opening of the oesophagus to the stomach is regulated by the gastro-oesophageal sphincter.
2. Fundus– It is dome-shaped and is usually filled with air.
3. Body– This is the main part of the stomach.
4. Pyloric– It opens in the first part of the small intestine, duodenum. The opening of the stomach into the small intestine is regulated by the pyloric sphincter.



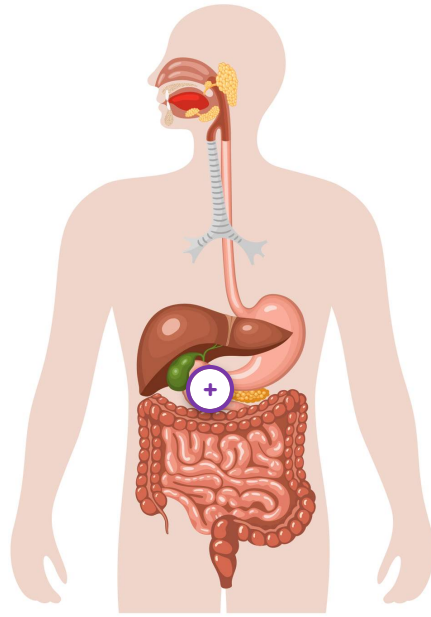
Pancreas

A glandular organ located in the abdomen. It makes pancreatic juices, which contain enzymes that aid in digestion, and it produces several hormones, including insulin. The right side of the organ-called the head-is the widest part of the organ and lies in the curve of the duodenum, the first division of the small intestine.



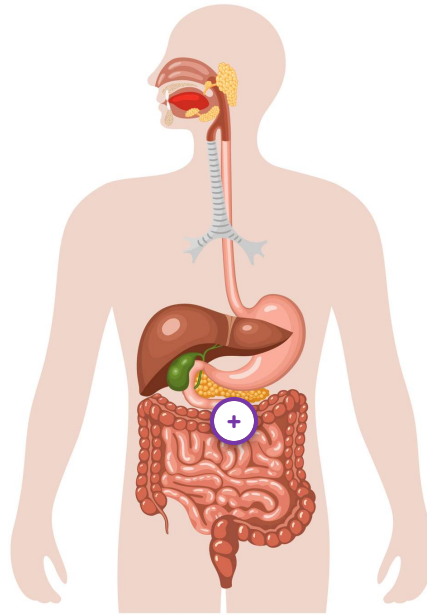
Liver

Your liver is your body's largest solid organ. On average, it weighs around three pounds in adulthood and is roughly the size of a football. This organ is vital to the body's metabolic functions and immune system. Without a functioning liver, a person cannot survive



Gallbladder

A pear-shaped, hollow organ located below the liver that stores the bile secreted by the liver. During and after a fatty meal, the gallbladder contracts, delivering the bile through the bile ducts into the intestines to help with digestion.



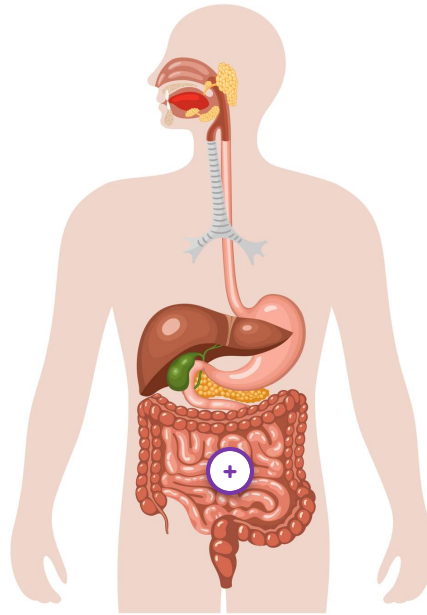
Large Intestine

The large intestine is the portion of the digestive system most responsible for absorption of water from the indigestible residue of food. It is composed of three parts: Caecum, Colon and Rectum.

Caecum– It is a small sac-like structure containing symbiotic microorganisms. The vermiform appendix (vestigial organ) is attached to it.

Colon– It is divided into four regions– ascending, transverse, sigmoid and descending.

Rectum– It opens into the anus. The ileocecal valve of the ileum (small intestine) passes material into the large intestine at the cecum.



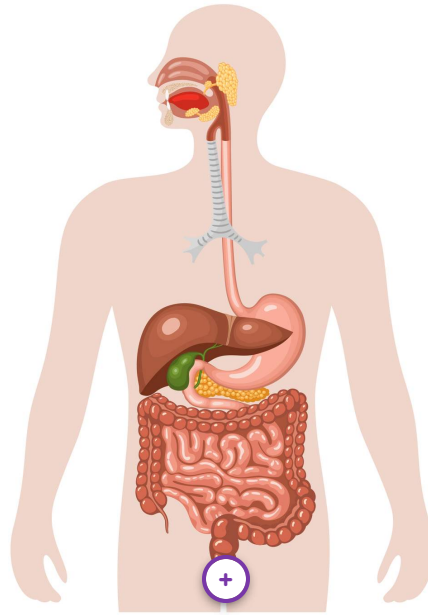
Small Intestine

The small intestine is the longest part of the digestive system. It extends from the stomach (pylorus) to the large intestine (cecum) and consists of **three** parts: duodenum, jejunum and ileum.

Duodenum – It is C- shaped. The pancreatic, bile and hepatic secretions are added to the food by hepatopancreatic duct.

Jejunum – Middle part of the small intestine.

Ileum – It is highly coiled and opens into the large intestine. It is the money maker for a person's digestive system. It's the place where digested food flows so that nutrients can be taken out of it and the body refueled.



Anal Canal

The dried, condensed fecal matter is stored in the rectum and sigmoid colon until it can be eliminated from the body through the process of defecation.

CONTINUE

Reproduction

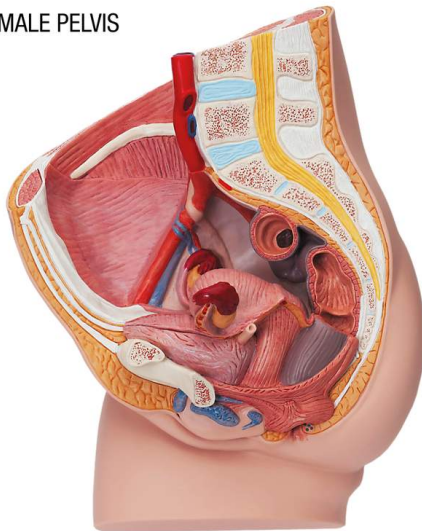
Anatomy and Physiology of the Reproductive System

Some of the organs in the male reproductive system play a dual role in both the function of this system, as well as in the function of the urinary system. The **female reproductive system** performs many functions, beginning with conception and continuing through to nourishing a

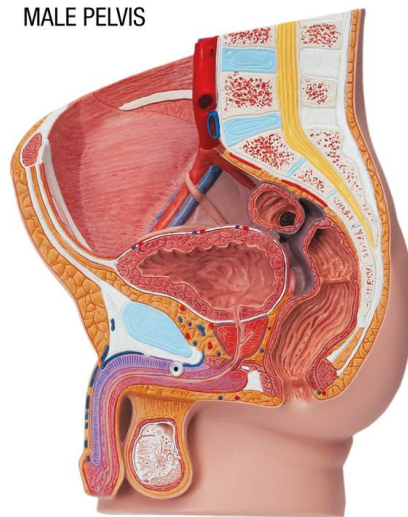
newborn. Later in this section, you will learn a bit more about the various components of these systems.

Let's begin discussing some of the organs in the male reproductive system. Some of the organs in the **male reproductive system** also play a role in urinary system function. The various components of the male reproductive system are discussed in this lesson. The components of the male reproductive system are divided into two groups: the primary sex organs (the two testes) and the accessory sex organs. Accessory sex organs are further divided into two groups: **internal** organs and **external** organs.

FEMALE PELVIS



MALE PELVIS

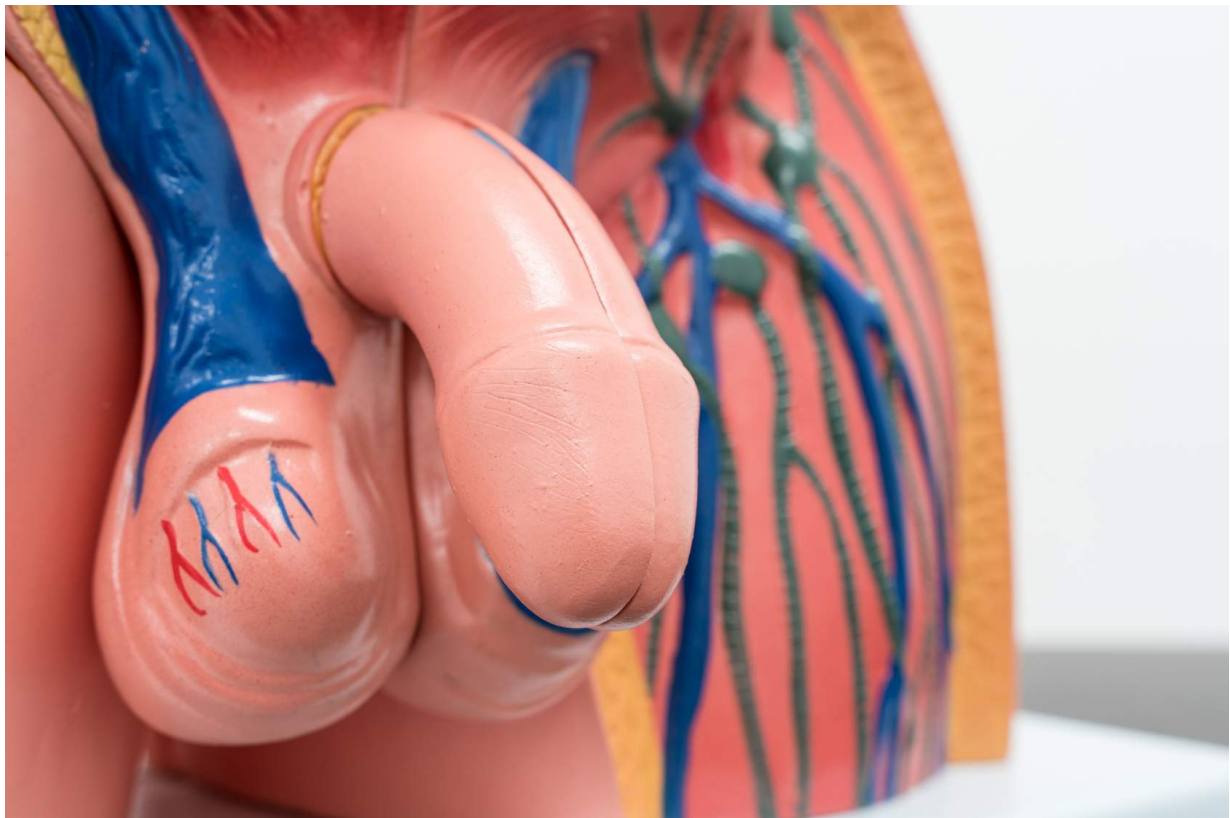


The female and male pelvis

Primary Male Sex Organs - The **testes** are two oval-shaped structures. They are made of a tough, fibrous capsule composed of connective tissue. Within the testes, there are many coiled tubules called **seminiferous tubules**.

Internal Male Accessory Sex Organs

Organ	Description
Epididymis	Coiled tubule that is located on the top and to the side of each testis.
Vas deferens	A tubule that connects the epididymis with the seminal vesicle.
Seminal vesicles	Passageways that lead from the vas deferens. The ducts of these vesicles unite to form the ejaculatory duct.
Ejaculatory duct	The part of the system that passes through the prostate gland and on to the urethra.
Prostate gland	A semicircular organ that surrounds the beginning of the urethra, just below the urinary bladder.
Urethra	Tubule that leads from the urinary bladder to the exterior of the body.



External Male Sex Organs

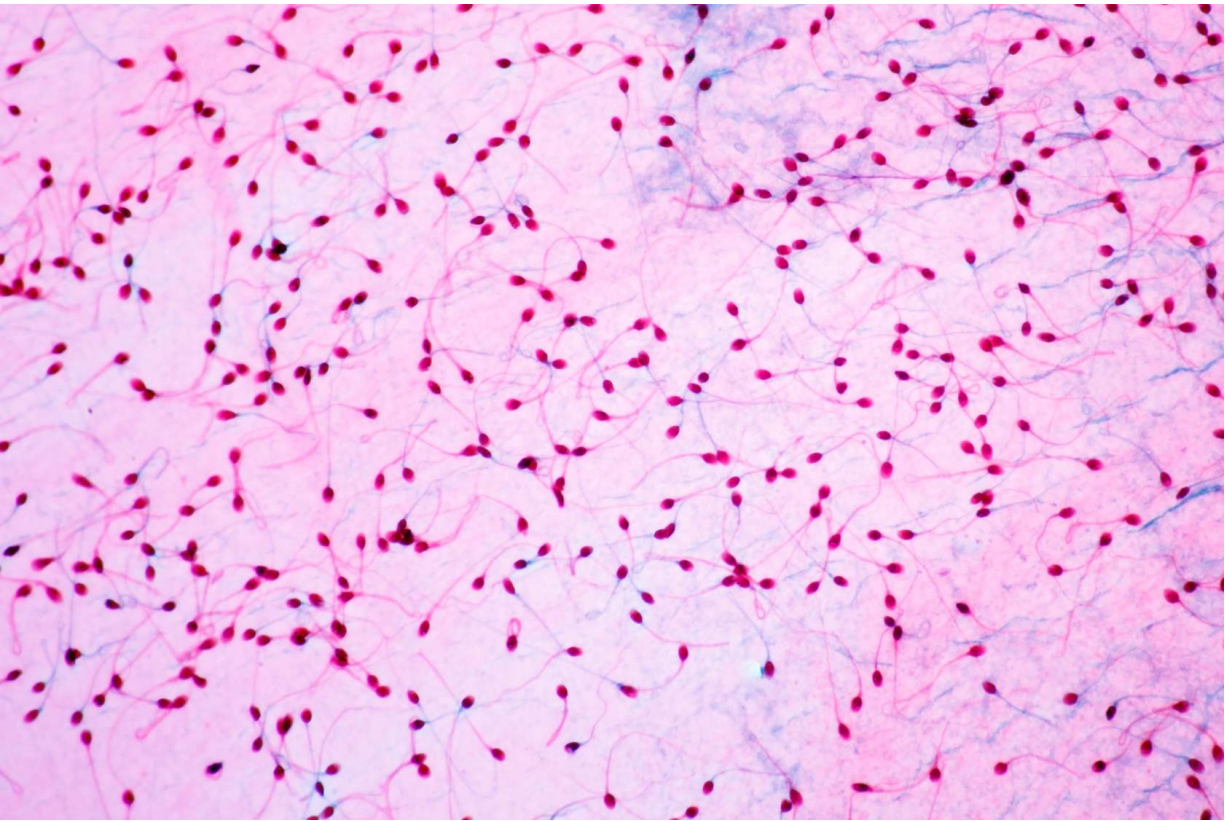
External Male Accessory Sex Organs

Two external organs, the penis and scrotum, are part of the accessory sex organs in the male. The penis is composed of both erectile and connective tissue. Erectile tissue is comprised mainly of masses of blood vessels. The distal end of the penis is called the glans penis. A loose flap of skin, known as the foreskin, covers the glans penis. The surgical removal of the foreskin is called a circumcision.

The urethra extends along the lower interior surface of the penis and opens to the exterior of the body through an opening called the external urinary meatus. The scrotum is made of both skin and muscle. This sac-like structure contains the two testes.

Physiology of the Male Reproductive System

The purpose of the male reproductive system is to produce male sex cells (sperm cells), transport these cells to the female reproductive system, and secrete male sex hormones within the body. Sperm cells are produced in the testes and transported to the epididymis where they mature. During sexual stimulation, the sperm cells are forced through the vas deferens to the ejaculatory duct. Additional fluid is secreted from the seminal vesicles to help carry the sperm through the ejaculatory duct.



Sperm



The Prostate Gland

The prostate gland also secretes a fluid into the ejaculatory duct that helps protect the sperm from acidic secretions present in the female vagina. The sperm and fluid secretions (semen) are then released into the vagina during sexual intercourse. The testes are the primary male sexual characteristic. An additional physiological role of the male reproductive system is to produce secondary male sexual characteristics. This is accomplished by the production of the male hormone testosterone. Testosterone is responsible for the following male characteristics:

- 1 The growth of body hair.
- 2 Thickening of the skin.
- 3 Thickening and strengthening of the bones.

4

Enlargement of the larynx and thickening of the vocal cords, which result in a lower pitched voice.

5

Increased muscle growth, and development of broader shoulders and a relatively narrow waist.

Multiple Choice

What secretes a fluid into the ejaculatory duct that helps protect the sperm from acidic secretions present in the female vagina?

☐

Epididymis

☐

Urethra

☐

Prostate Gland

☐

Vas deferens

SUBMIT

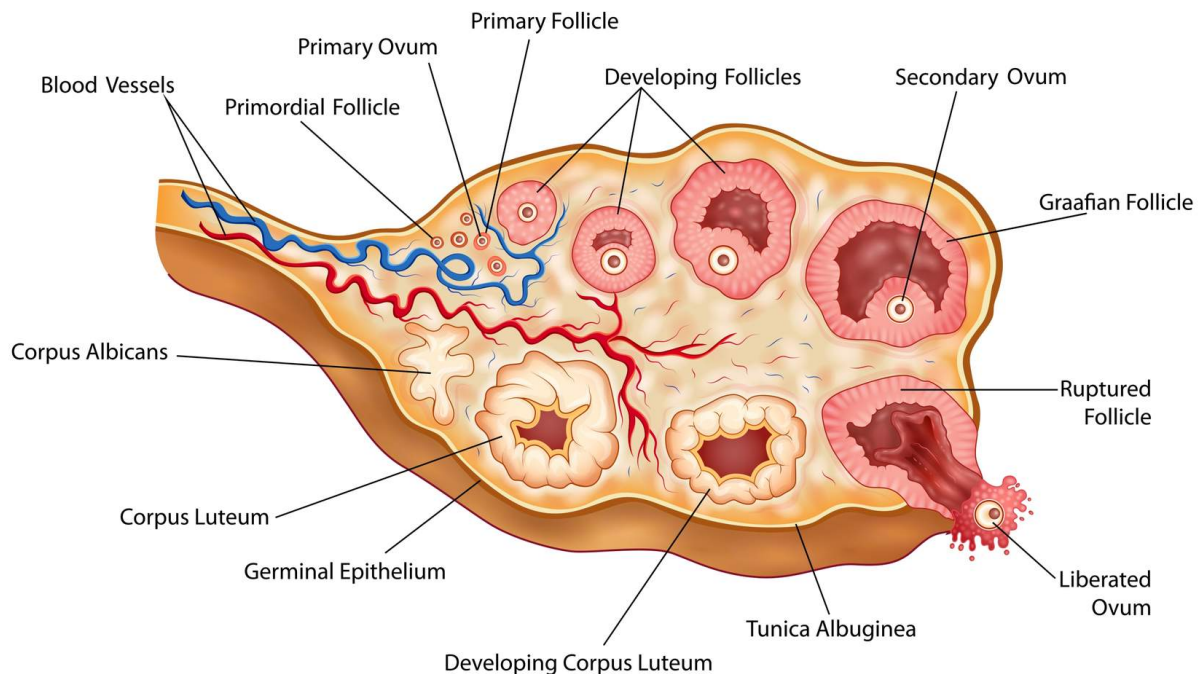


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The Female Reproductive System

The female reproductive system has various organs that work together to make up the anatomy of the female reproductive system. As in the male, the female organs are divided into **two** main categories: the **primary sex organs** (ovaries) and the **internal and external accessory organs**.

OVARY

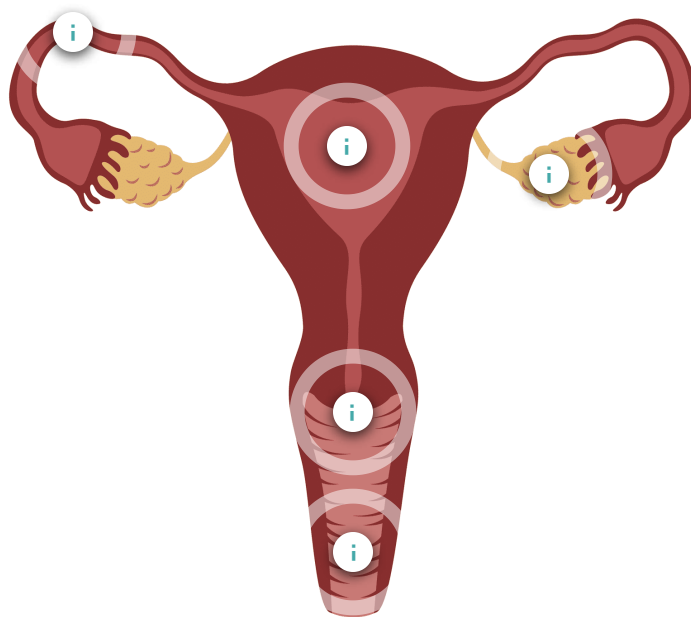


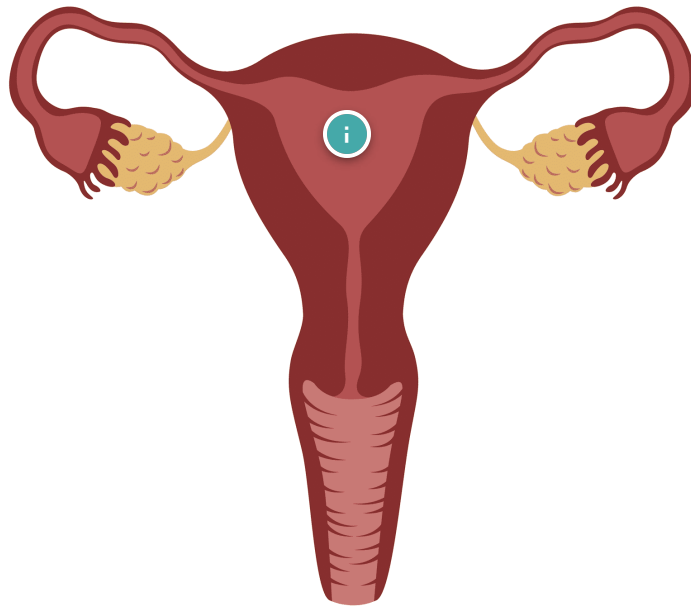
Primary Sex Organs

The two ovaries are solid, round-shaped structures. Both ovaries are located inside the lateral wall of the pelvic cavity. The ovaries are held in position by several ligaments. Each ovary has two main parts: an **inner medulla** and an **outer cortex**.

Internal Female Accessory Sex Organs

The three female internal accessory sex organs include the fallopian tubes, uterus and vagina. Let's take a quick look at each of these organs in the picture below.

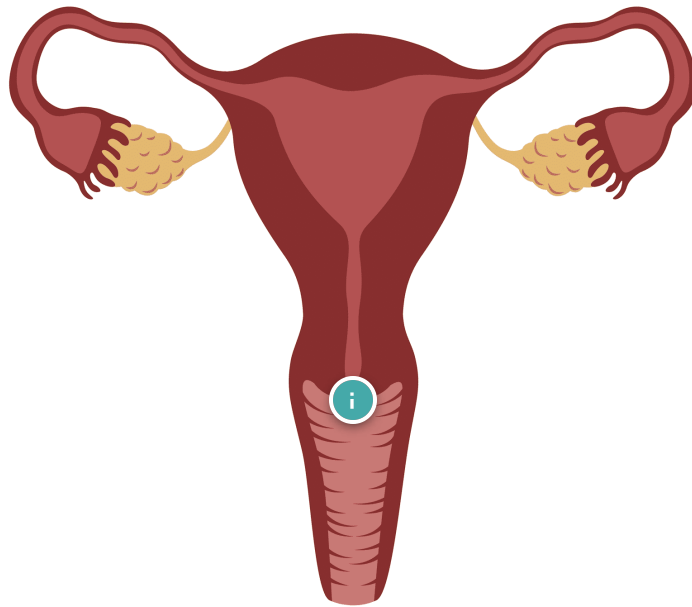




Body of the Uterus

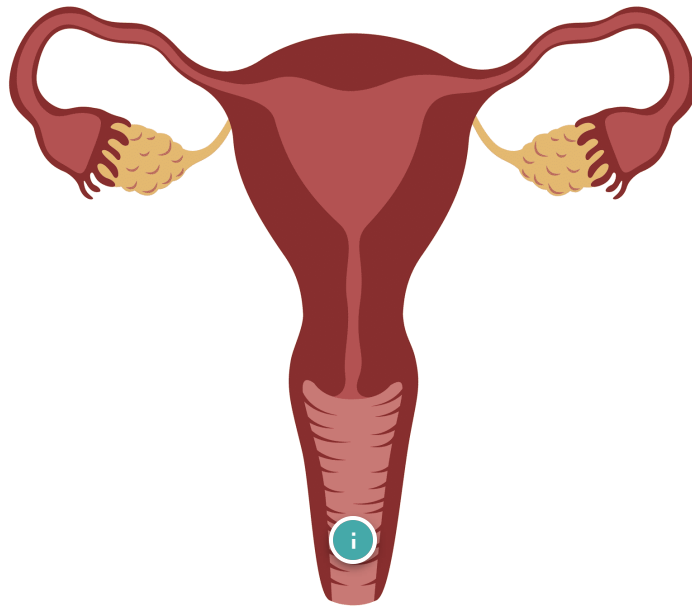
The uterus is a hollow, muscular, pear-shaped organ. It is located in the anterior portion of the pelvic cavity above the vagina. The upper two-thirds of the uterus is called the body and the top of the body is called the fundus. The lower third of the uterus is known as the cervix. The cervix extends to the vagina.

The uterine wall is divided into three layers; perimetrium, myometrium, and endometrium. Perimetrium is the outer layer that covers the uterine body and part of the cervix. Myometrium is the thick, muscular inner portion of the uterus. Endometrium lines the inner wall of the uterus.



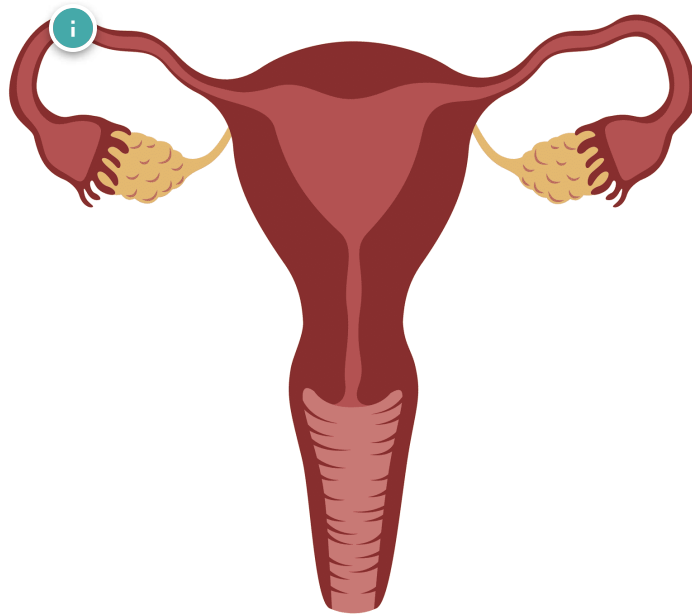
Cervix

Your cervix is a passage that allows fluids to flow inside and out of your uterus. It's also a powerful gatekeeper that can open and close in ways that make pregnancy and childbirth possible.



Vagina

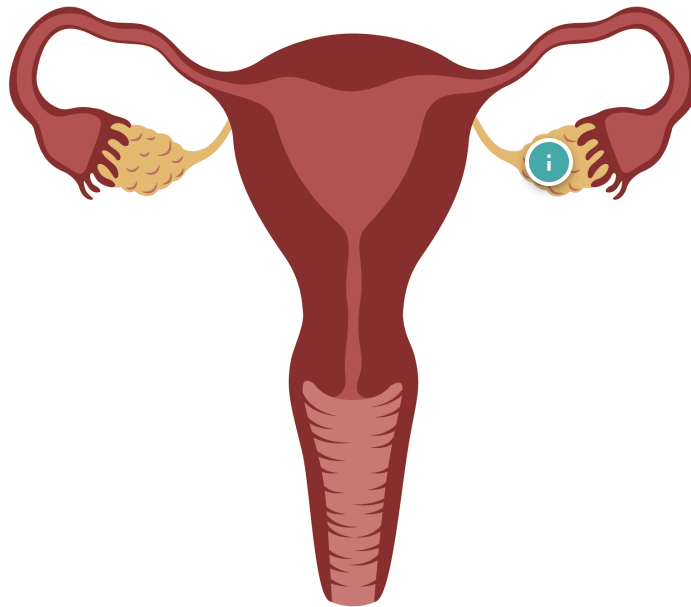
The vagina is a tube-like organ that extends from the uterus to the exterior of the body. It is approximately three inches long. The opening of the vagina is called the vaginal orifice and it is partially covered by a thin membrane of connective tissue called the hymen.



Fallopian Tubes

There are two fallopian tubes, each of which is approximately four inches long. They extend from the uterus to the ovaries, with the open end of each tube located near an ovary.

The openings in the fallopian tubes have finger-like extensions called fimbriae. One of the longer fimbriae is attached directly to the ovary; the rest of the fimbriae remain free.



Ovary

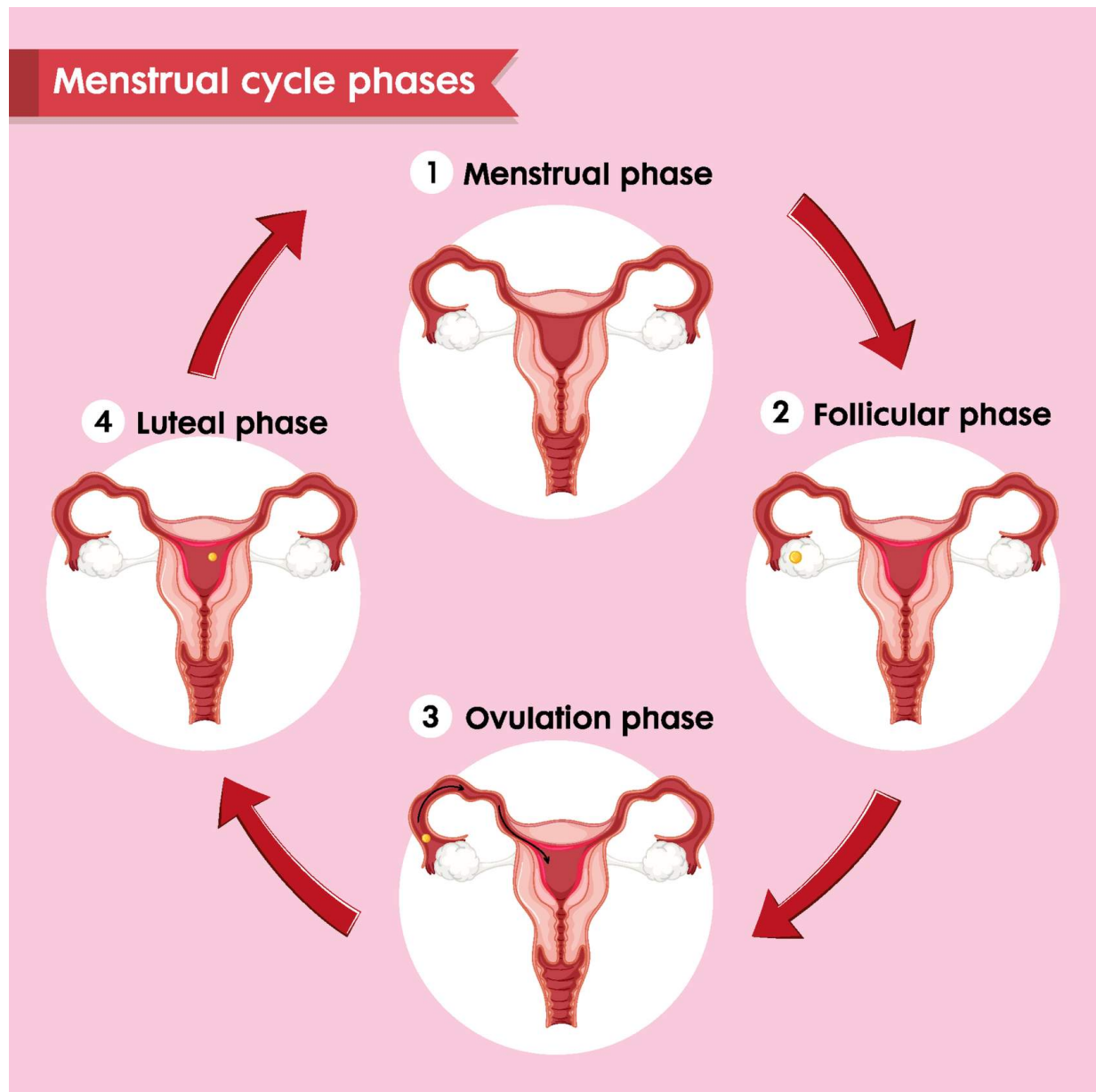
Eggs are produced in each ovary.

External Female Accessory Sex Organs

Four external organs are part of the accessory sex organs in the female. These organs, which are collectively known as the vulva, are the labia majora, labia minora, clitoris and vestibule. Labia majora encloses and protects the external reproductive organs. It is actually a large fold of adipose tissue that contains sweat glands, sebaceous glands and hair follicles. The pad of fatty tissue located superior to the labia majora is known as the mons pubis. Labia minora is a layer of connective tissue that contains many blood vessels. It is located beneath the labia majora.

Clitoris is a small organ that is made of erectile tissue. It is located anteriorly between the labia minora. Vestibule is the area of the vulva that is enclosed by the labia minora. The vagina opens into the vestibule, as does the urethra. The vestibular glands are within the vestibule. In addition to these four organs, the mammary glands (breasts) also play an important role in the female

reproductive system. Each mammary gland is comprised of numerous irregularly shaped lobes. Each of these lobes is a highly branched gland that has a separate duct leading to the nipple.



Menstrual Cycle

The female reproductive system is designed to produce ova, receive sperm from the male for fertilization of the ova, generate the growth of unborn offspring, give birth and nourish the newborn. Once puberty is reached, around the age of 13, the female menstrual cycles begin. This

first menstrual cycle is known as menarche. The first phase of the cycle begins with menstruation (sometimes called menses). Blood, secretions and tissue debris flow from the uterus through the vagina for approximately three to seven days. The second phase of the cycle begins on approximately the 14th day, when an egg (ovum) is released from one of the ovaries. This is called ovulation.

The Luteal phase is when the ovum travels to the fallopian tube, where it awaits possible fertilization by the sperm. If a sperm fertilizes the ovum, the ovum will travel to the uterus where it attaches to the endometrium. Pregnancy has occurred and growth of the fetus begins. If the ovum is not fertilized, the endometrium breaks up and discharges through the vagina on approximately the 28th day of the cycle. The entire process is then repeated. The menstrual cycle continues to repeat until the female is in her late forties or early fifties, when she is said to have reached menopause. Watch the video below about the fertilization process.

Multiple Choice

What phase of the menstrual cycle does pregnancy occur?

- ☐ Menstrual
- ☐ Follicular
- ☐ Ovulation
- ☐ Luteal

SUBMIT



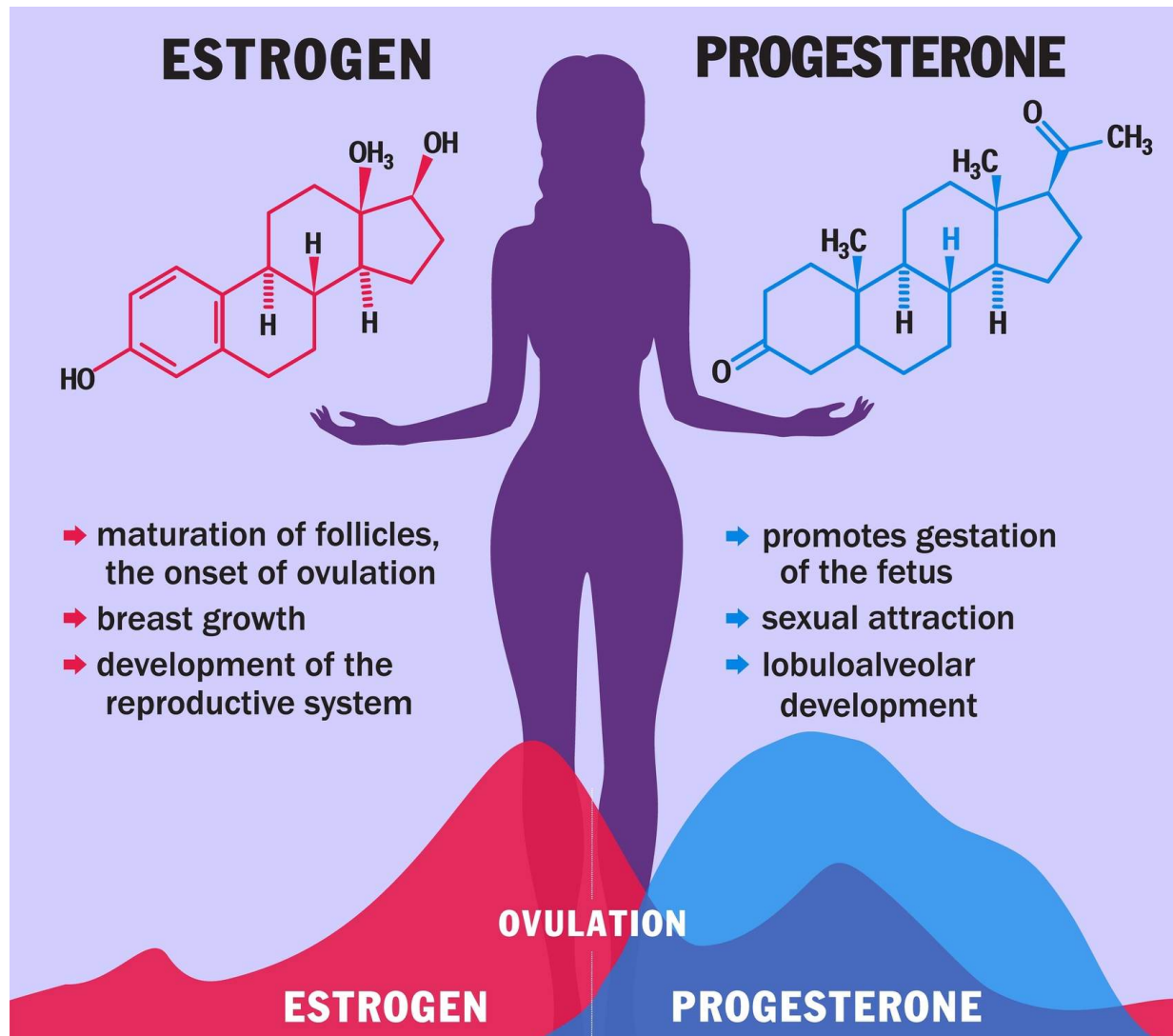
Complete the content above before moving on.

Watch the video below to learn more about fertilization.



Fertilization Video Transcript.pdf

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Hormones

During the menstrual cycle, the female hormones estrogen and progesterone are secreted to perform various functions and stimulate changes in the uterine lining.

These hormones are also essential in the development of the following secondary sex characteristics in the female:

- Development of pubic hair
- Development of broader hips and narrower shoulders
- Increased tissue mass in the hips, abdomen and buttocks
- Development of the mammary glands
- Development of menarche

CONTINUE

The Reproductive and Endocrine System

Some of the organs in the male reproductive system play a dual role in both the function of this system, as well as in the function of the urinary system. The female reproductive system performs many functions, beginning with conception and continuing through to the nourishing a newborn.

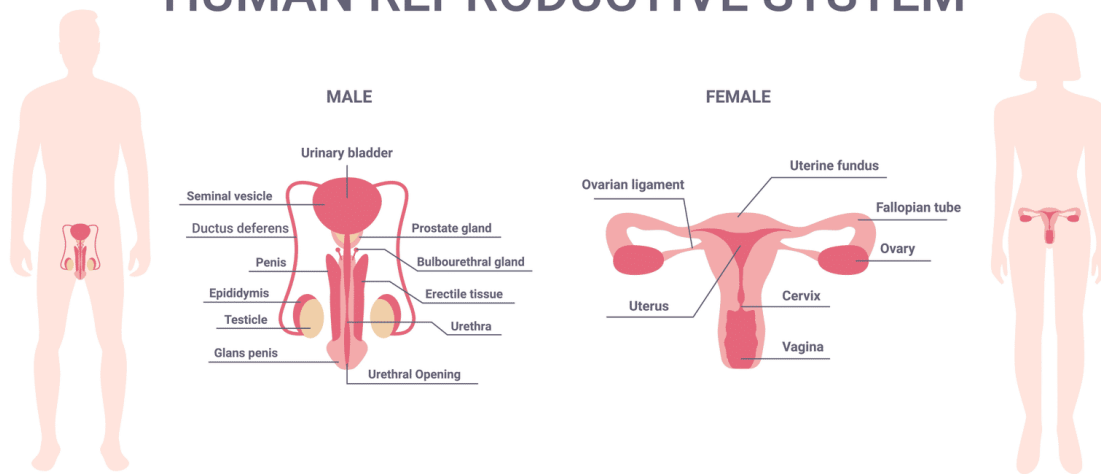
The **endocrine system** works with the nervous system to direct body functions, specifically controlling and maintaining stabilization by **releasing hormones**. The components of the male reproductive system are divided into **two** groups: the primary and accessory sex organs which are further divided into internal and external organs.

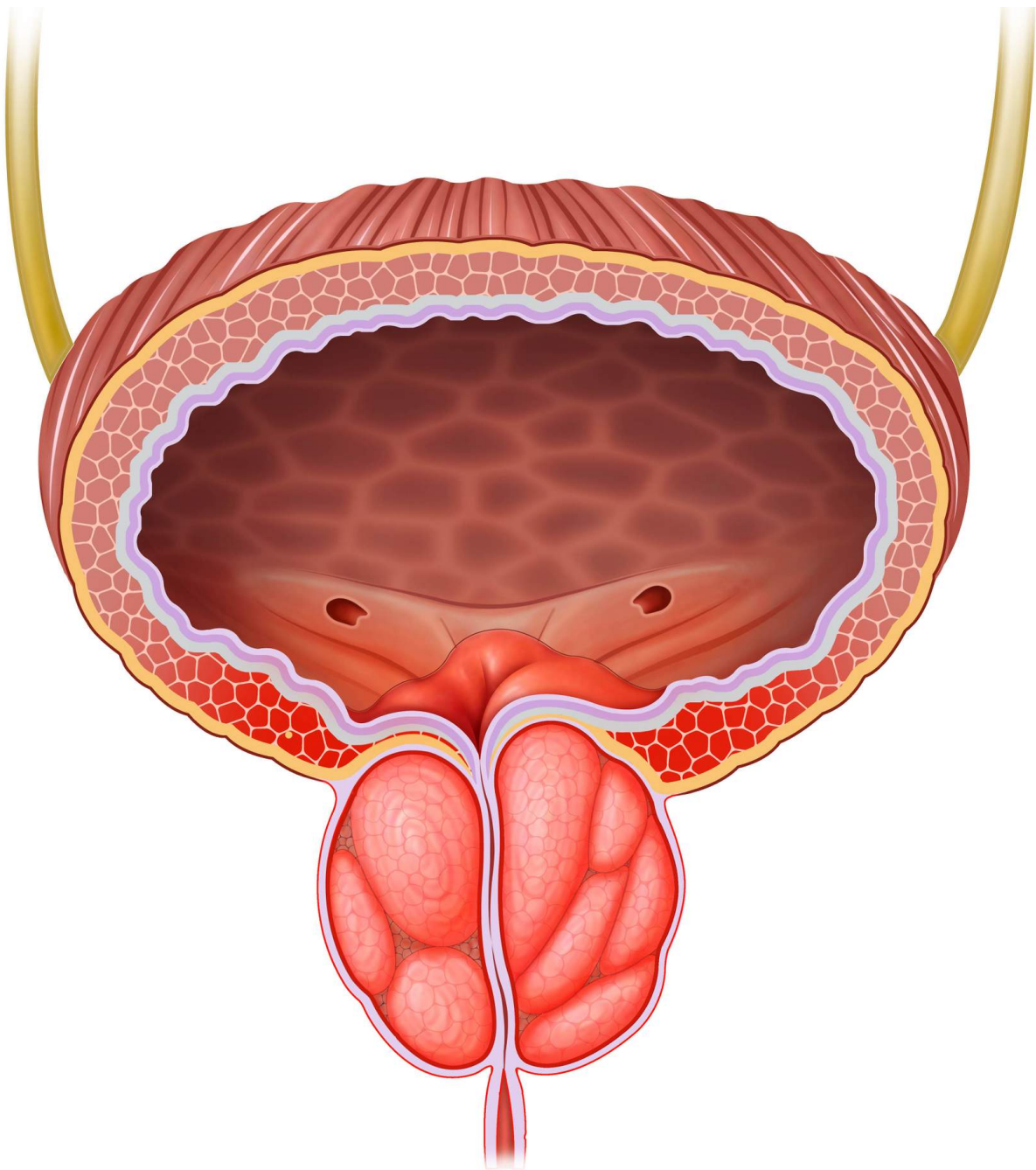
The primary organs are the testes, two oval shaped structures made of a tough, fibrous capsule composed of connective tissue. Within the testes, there are many coiled tubules called

seminiferous tubules. The internal accessory sex organs are the epididymis, vas deferens, seminal vesicles, ejaculatory duct, prostate gland and urethra. The epididymis is a coiled tubule located on top and to the side of each testis.

The vas deferens is tubule connecting the epididymis with the seminal vesicle. Seminal vesicles are passageways leading from the vas deferens. The ducts of these vesicles unite to form the ejaculatory duct. The ejaculatory duct is the part of the system that passes through the prostate gland and on to the urethra.

HUMAN REPRODUCTIVE SYSTEM





The prostate gland is a semi round organ surrounding the beginning of the urethra, just below the urinary bladder. Finally, the urethra is a tubule that leads from the urinary bladder to the exterior of the body. The two external organs are the penis and scrotum. The penis is composed of erectile and connective tissue. Erectile tissue is comprised mainly of masses of blood vessels.

The distal end of the penis is the glans penis with a loose flap of skin covering, known as the foreskin. The surgical removal of the foreskin is called a circumcision. The urethra extends

along the lower interior surface of the penis and opens to the exterior of the body through the external urinary meatus. The scrotum contains two testes and is made of skin and muscle.

Watch the video below to learn more about the anatomy and physiology of the male reproductive system.



**Male Reproductive System Crash Course Anatomy & Physiology
Transcript.pdf**

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The purpose of the male reproductive system is to produce male sperm cells, transport to the female reproductive system, and secrete male sex hormones within the body. Sperm cells are produced in the testes and transported to the epididymis where they mature. During sexual stimulation, sperm cells are forced through the vas deferens with additional fluids secreted from the seminal vesicles to the ejaculatory duct.

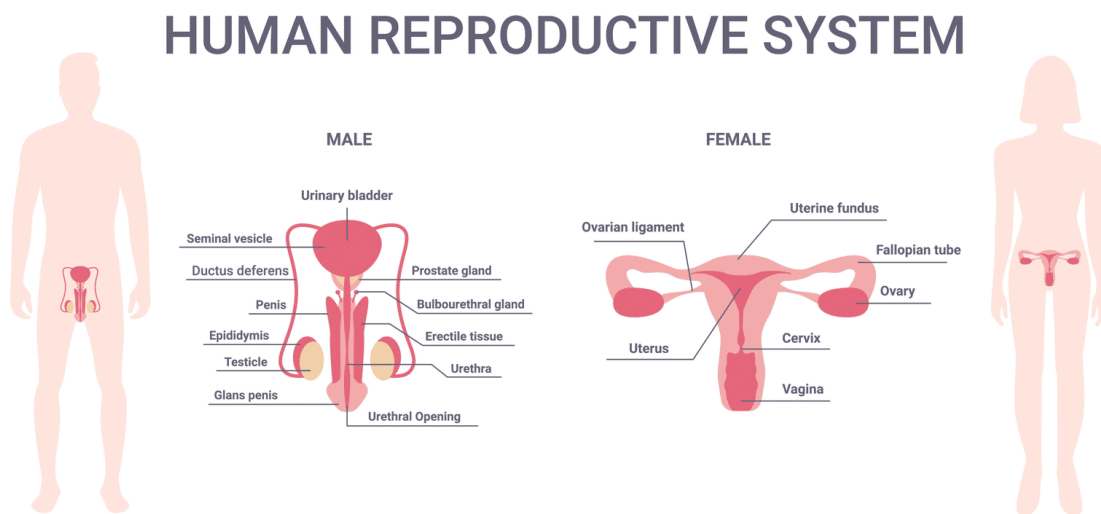
Additionally, the prostate gland secretes a fluid into the ejaculatory duct protecting the sperm from acidic secretions present in the female vagina. The sperm and semen are then released into the vagina during sexual intercourse. The testes are the primary male sexual characteristic along with testosterone production.

Testosterone is responsible for numerous changes in the body, to include:

- Growth of body hair
- Thickening of skin
- Strengthening of the bones
- Enlargement of the larynx and thickening of the vocal cords; resulting in a lower-pitched voice
- Increased muscle growth
- Development of broader shoulders and relatively narrow waist

CONTINUE

The female organs also are divided into two main categories: the primary sex organs and the internal and external accessory organs. The primary sex organs are two ovaries: solid, round-shaped structures. Both ovaries are located inside the lateral wall of the pelvic cavity. The ovaries are held in position by several ligaments. Each ovary has two main parts: an inner medulla and an outer cortex. The three female internal accessory sex organs are the fallopian tubes, uterus and vagina.



There are two fallopian tubes, each approximately four inches long extending from the uterus to the ovaries, with the open end of each tube located near an ovary. The openings in the fallopian tubes have finger-like extensions called fimbriae. One of the longer fimbriae is attached directly to the ovary; the rest of the fimbriae remain free. The uterus is a hollow, muscular, pear-shaped

organ located in the anterior portion of the pelvic cavity above the vagina. The upper two-thirds of the uterus is the body, and the top of the body is the fundus. The lower third of the uterus is known as the cervix which extends to the vagina. The uterine wall is divided into three layers; perimetrium, myometrium, and endometrium.

Watch the video below to learn more about the female reproductive system.





Female Reproductive System Crash Course Anatomy & Physiology Transcript.pdf

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Perimetrium is the outer layer that covers the uterine body and part of the cervix. Myometrium is the thick, muscular inner portion of the uterus. Endometrium lines the inner wall of the uterus. The vagina is a tube-like organ that extends from the uterus to the exterior of the body and measures approximately three inches long. The opening of the vagina is called the vaginal orifice and partially covered by a thin membrane of connective tissue called the hymen.

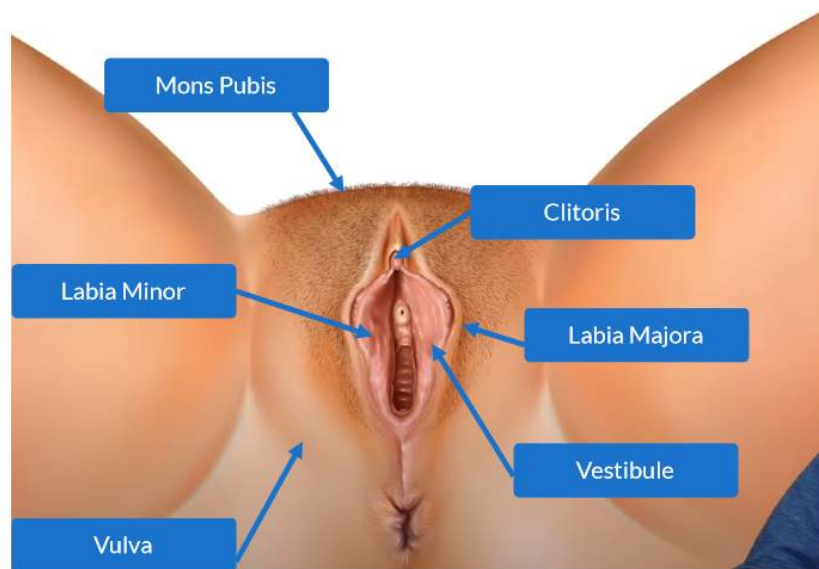
The four external organs in the female are the labia majora, labia minora, clitoris and vestibule collectively known as the vulva. Labia majora, is a fold of adipose tissue containing sweat glands, sebaceous glands and hair follicles that encloses protecting the external reproductive organs.


Superior to the labia majora is the mons pubis. The Labia minora is a layer of connective tissue containing many blood vessels located beneath the labia majora. Clitoris is a small organ that is made of erectile tissue. It is located anteriorly between the labia minora. Vestibule is the area of the vulva that is enclosed by the labia minora housing vestibular glands.

The vagina opens into the vestibule, as does the urethra. Additionally, the mammary glands or breasts play a role in the female reproductive system. Each mammary gland is comprised of numerous irregularly shaped lobes with highly branched glands that have a separate duct leading to the nipple.

Practice below by dragging the correct term to the correct area of the vagina.

Sections of the Vaginal structure



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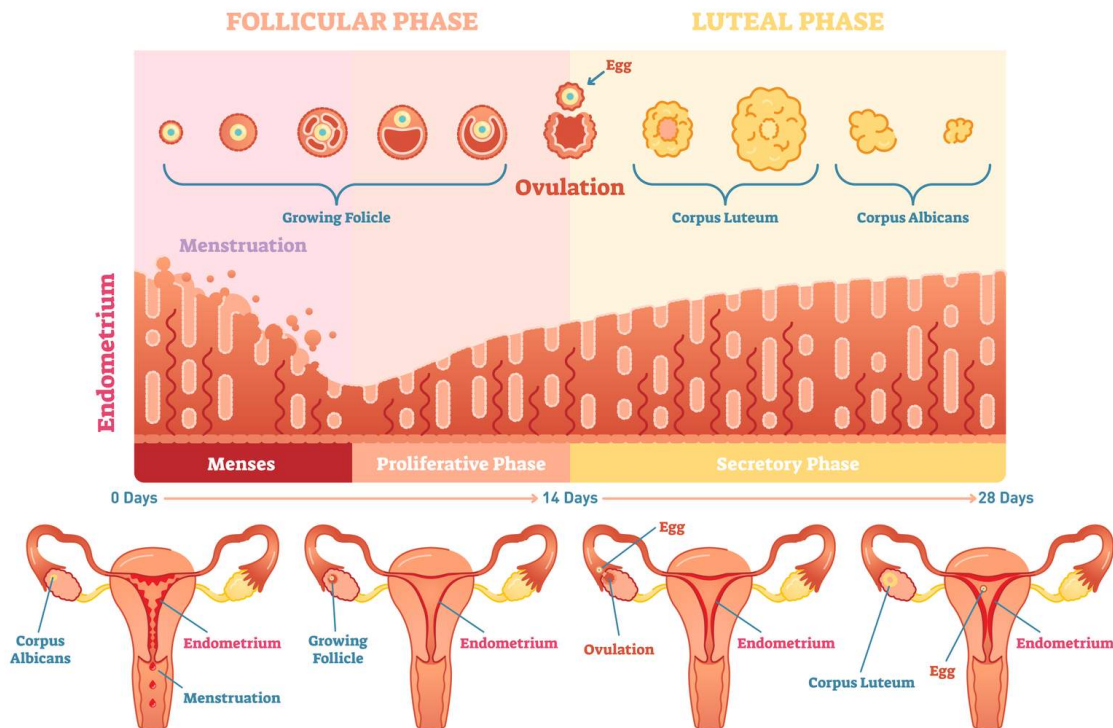
The Female Menstrual Cycle



The female reproductive system is designed to produce ova, receive sperm from the male for fertilization of the ova, generate the growth of unborn offspring, give birth and nourish the newborn. Once puberty is reached, around the age of 13, the female menstrual cycles begin. This first menstrual cycle is known as menarche. The first phase of the cycle begins with menstruation sometimes called menses. Blood, secretions and tissue debris flow from the uterus through the vagina for approximately three to seven days.

The second phase of the cycle begins on approximately the 14th day, when an egg or ovum is released from one of the ovaries, known as ovulation. The ovum travels to the fallopian tube where it awaits fertilization by the sperm. If a sperm fertilizes the ovum, the ovum will travel to the uterus where it attaches to the endometrium. Pregnancy has occurred and growth of the fetus begins. If the ovum is not fertilized, the endometrium breaks up and discharges through the vagina on approximately the 28th day of the cycle.

FEMALE SEXUAL CYCLE



The entire process is then repeated until the female is in her late forties or early fifties, when she is said to have reached menopause. During the menstrual cycle, the female hormones estrogen and progesterone are secreted to perform various functions and stimulate changes in the uterine lining. Additionally, these hormones are also essential in the development of the following secondary sex characteristics in the female such as the development of pubic hair, broader hips and narrower shoulders, increased tissue mass in the hips, abdomen and buttocks and the development of the mammary glands.

Watch the video below for a nice overview of the female reproductive system, menstrual cycle, hormones and regeneration.



Female Reproductive System - Menstrual Cycle, Hormones and Regulation Transcript.pdf

161 KB



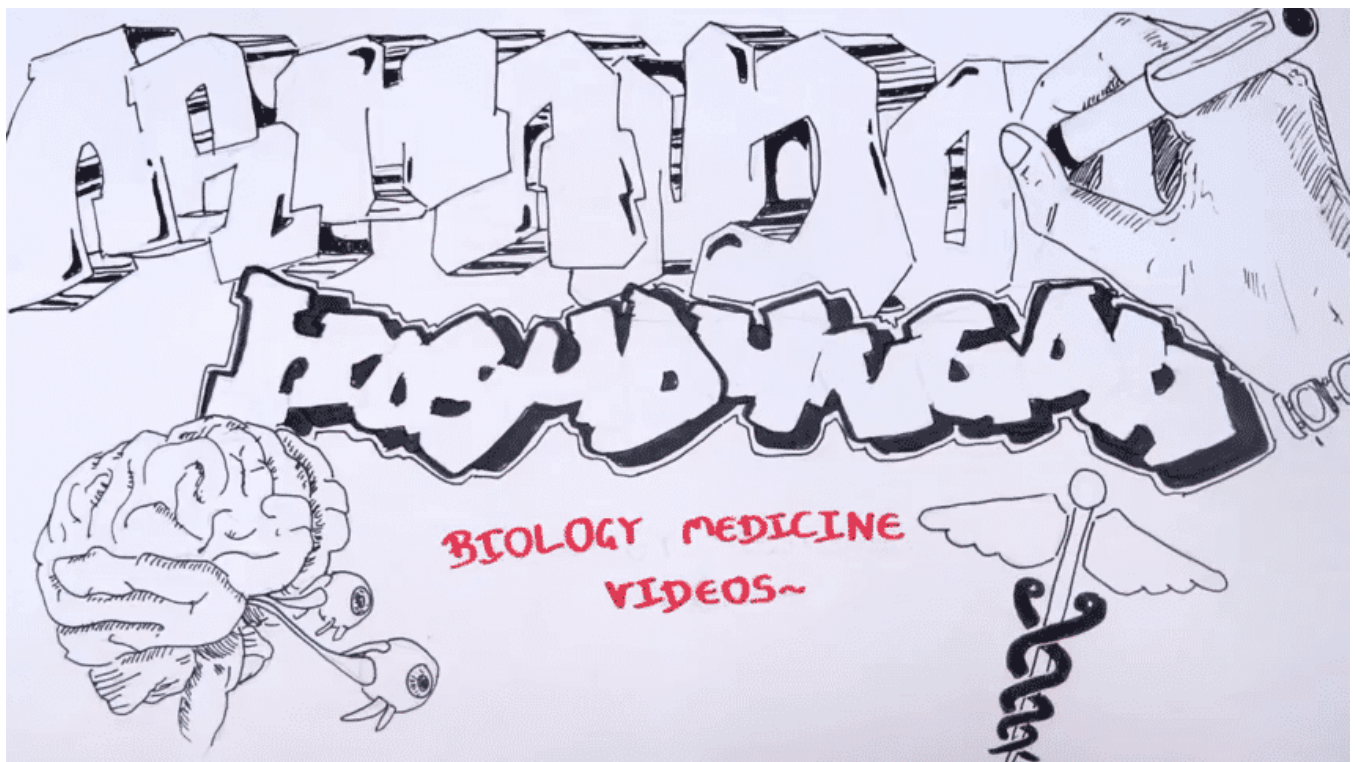
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Hormones are chemical substances secreted by certain cells to **control** various bodily functions.

The endocrine system is the network of glands that produce and secrete the hormones. This system of glands and the hormones they produce influence everything that's going on in your body, whether you are digesting your lunch or running from a wild tiger. In this section, you will learn what the glands of the endocrine system are and a little about what each of them does for us.

Each of the glands within the endocrine system secretes a specific hormone. These hormones either travel short distances to nearby cells or are released into the bloodstream to travel to other parts of the body. Cells that receive the hormones and act as receptors are known as "target cells." Though some small, specialized cell groups produce and secrete hormones, this lesson focuses only on the major glands of the body—pituitary, thyroid, parathyroid, adrenal and pancreas. The pituitary gland is also referred to as the body's "master gland" because of the controlling effect it has on the other glands. Being approximately one cm in diameter, this gland is located at the base of the brain and attached to the hypothalamus.

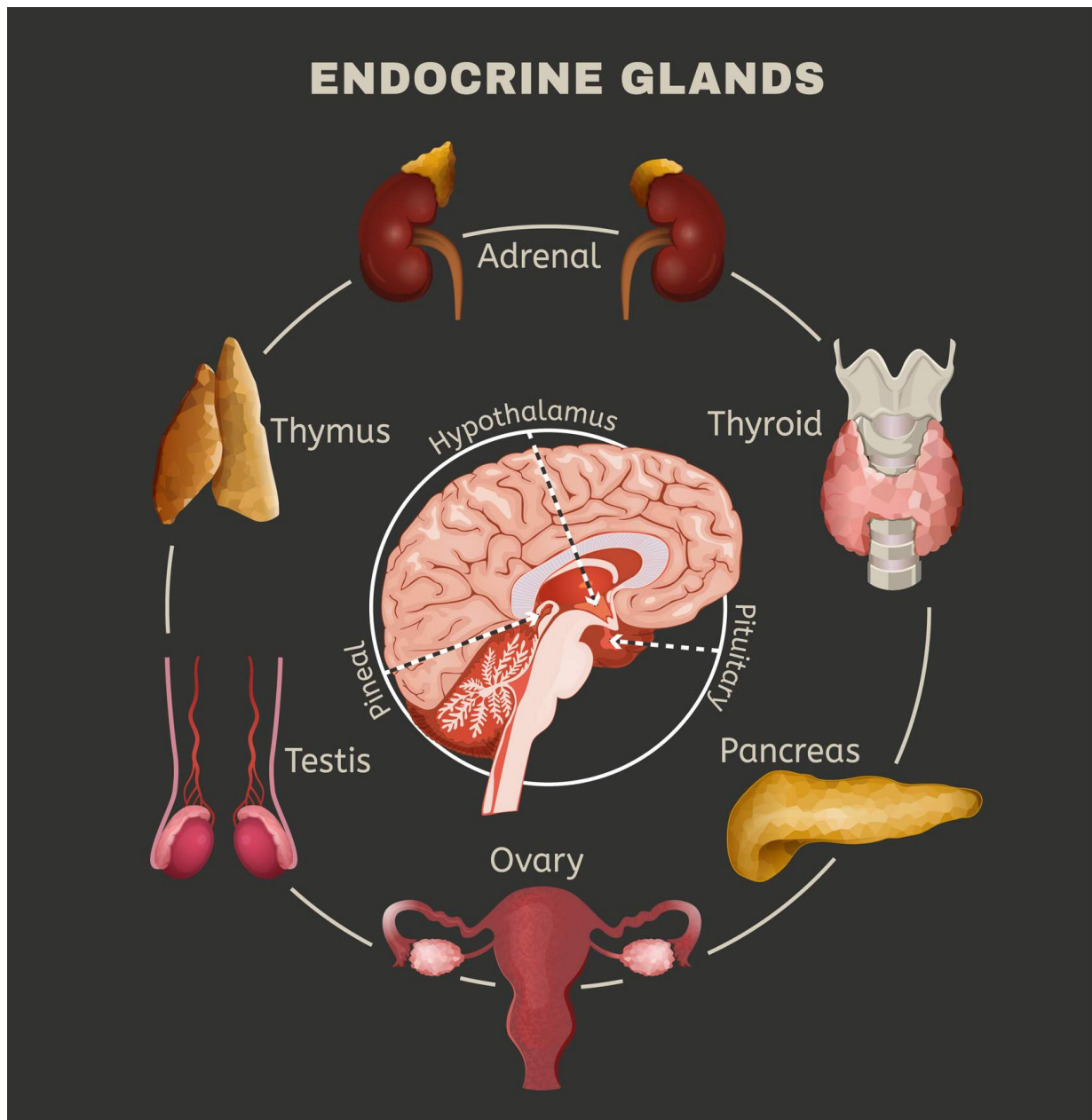
Watch the video below to learn more about endocrinology.



Endocrinology Overview Transcript.pdf

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The pituitary gland is divided into two main sections the anterior and posterior lobe. The anterior lobe secretes six hormones while the posterior lobe secretes two. Antidiuretic (ADH) and oxytocin (OT) hormones are produced from the posterior lobe. ADH reduces the amount of water excreted by the kidneys.

High concentrations of this hormone cause the blood pressure to rise. Oxytocin (OT) stimulates uterine wall contractions and those within the mammary glands to produce milk. The thyroid gland is located just below the larynx and anterior to the trachea. It has two large lateral lobes that are attached to a central stem, which gives the thyroid gland a butterfly shape.

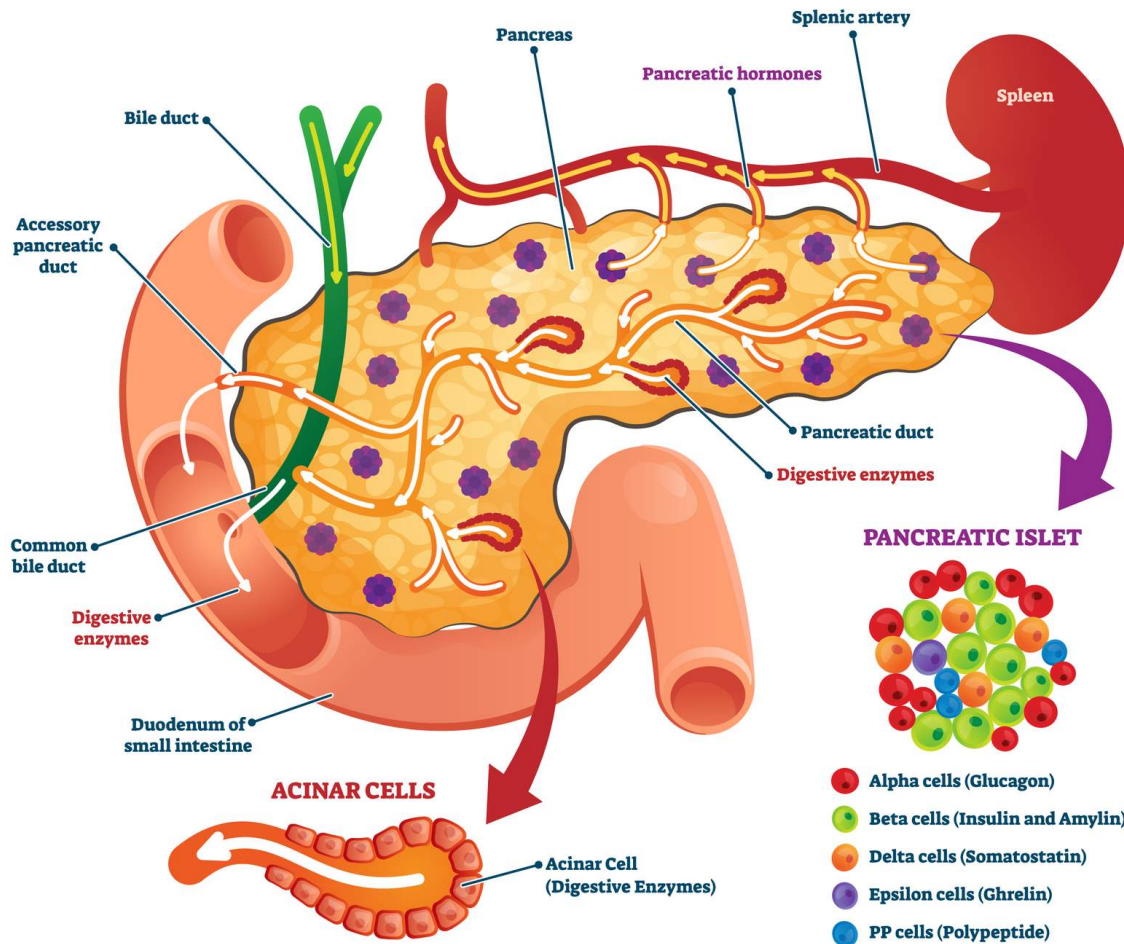
The thyroid gland secretes three hormones calcitonin, thyroxine and triiodothyronine. Calcitonin lowers calcium and phosphate concentrations in the blood by limiting the release of these substances from the bones and stimulating the kidneys to excrete excess amounts of the substances. Thyroxine accounts for about 95% of the thyroid hormones. Thyroxine stimulates release of energy from carbohydrates, increases protein metabolism, growth and nervous system activity. Triiodothyronine is the same as thyroxine, but five times more potent and circulated in a much smaller amount.

There are four parathyroid glands, all located on the posterior surface of the thyroid gland attached to the top and bottom of each lobe. The parathyroid glands secrete parathormone which stimulates the release of calcium from the bones, causes kidneys to conserve calcium by preventing overexcretion and assists in stimulating the intestines to absorb calcium. There are two adrenal glands, shaped like pyramids on the superior portion of each kidney. Each adrenal gland has two parts, the adrenal cortex and adrenal medulla.

The adrenal cortex is the outer part composed of layers of cells that are packed closely together making up most of the gland. Additionally, the adrenal cortex secretes the aldosterone, cortisol, and sex hormones. Aldosterone helps regulate electrolytes by causing sodium to be reabsorbed and potassium to be excreted. Cortisol promotes the metabolism of proteins and fats causing an increase in use of fatty acids for energy and a decrease in use of glucose for energy. Cortisol also promotes an increase in blood glucose concentration. Sex hormones assist in stimulating the development of sex organs. The adrenal medulla is the inner part containing irregularly shaped cells grouped around blood vessels and connects to the sympathetic nervous system. The adrenal medulla secretes epinephrine and norepinephrine hormones.

Epinephrine increases heart rate stimulating forceful contractions, causes skeletal muscle blood vessels and airway to dilate and increases the level of blood sugar and metabolism. Norepinephrine increases the force of heart contractions but has less effect on heart rate than epinephrine. Additionally, this hormone causes skin blood vessels to constrict, resulting in a greater flow of blood to skeletal muscles. Norepinephrine affects the airway less than epinephrine does and it has little effect on blood sugar level; however, it does increase the metabolism.

PANCREAS



Lastly, the pancreas is a long, flat organ lying posterior to the stomach. It is attached to the duodenum by a duct. The portion of the pancreas that functions as part of the endocrine system is called the “Islets of Langerhans.” The Islets of Langerhans contain cells that are closely associated with blood vessels, and secrete three hormones: glucagon, insulin, and somatostatin. Glucagon stimulates the liver to break down fats into fatty acids and glycerol and to convert certain substances into glucose.

Insulin regulates metabolism of glucose and inhibits the conversion of certain substances into glucose. Insulin also stimulates the transportation of amino acids into the cells and the storage

of fat by adipose cells. Somatostatin helps regulate carbohydrates by inhibiting the secretion of glucagon.

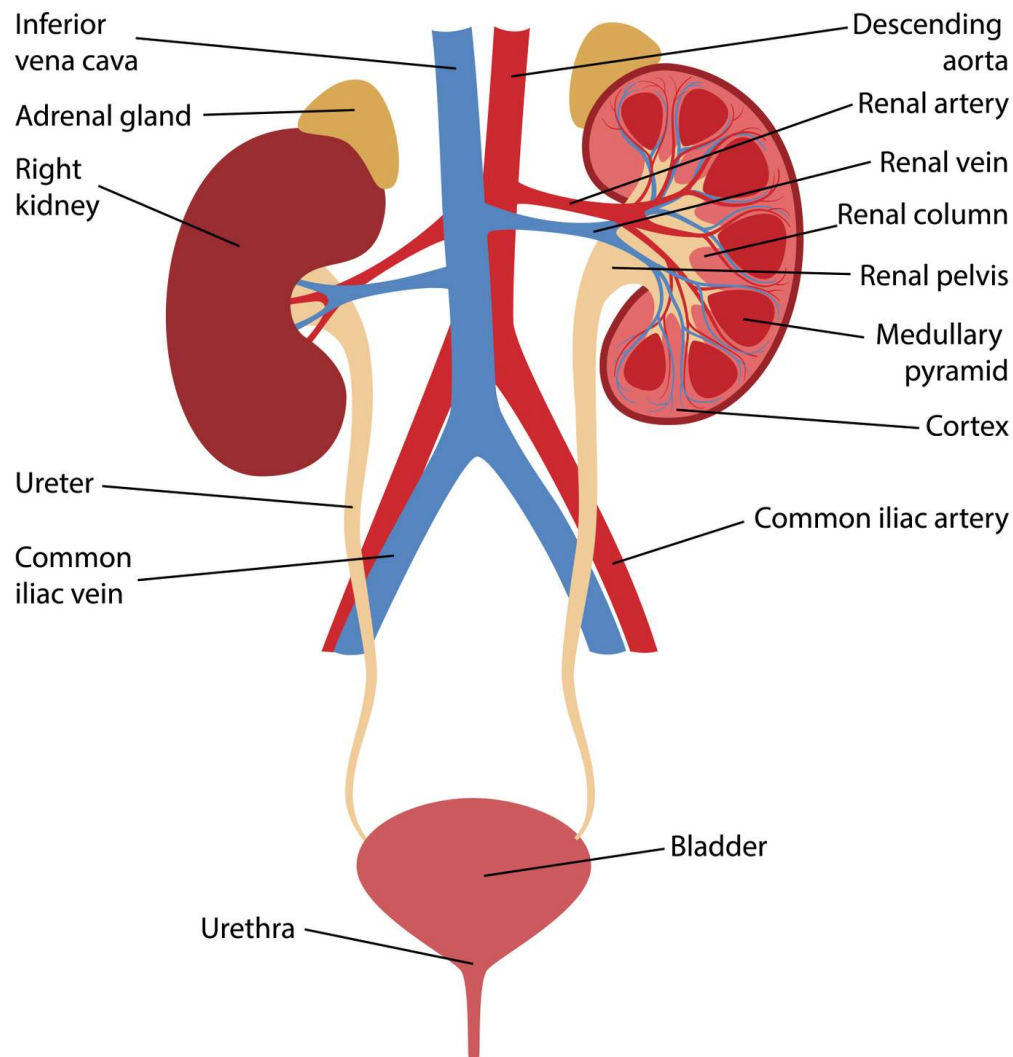


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The Urinary System

The urinary system removes waste from the body only through the proper functioning of all the system components. The urinary system consists of four main parts: the kidneys, ureters, urinary bladder and urethra. The human body has two kidneys, bean-shaped organs located in the superior portion of the posterior abdominal cavity approximately 12 cm long, 6 cm wide and 3 cm thick. The kidneys lie on either side of the spinal column and extend from near the twelfth thoracic vertebrae to the third lumbar vertebrae. Little protection is provided to the kidneys, except from the lower ribs.

Anatomy of the urinary system



The renal pelvis is the concave or indented portion of the kidneys, where blood vessels, lymphatic vessels, nerves and the ureter connect to the kidney entering a hollow chamber, the renal sinus. Within each kidney are two areas: the renal cortex, which is the outer area, and the renal medulla, which is the inner portion of the kidney. The renal cortex is responsible for protecting the vital kidney functions that occur within the renal medulla. Each kidney contains approximately one million microscopic structures called nephrons. The nephrons make up the complex filtration system that performs the primary function of the kidneys. A nephron is composed of a cluster of capillaries called a glomerulus.

The glomerulus is enclosed within a thin sac called the Bowman's capsule, a tiny system of coiled tubules leading to and from the glomerulus. Extending from the renal pelvis of each kidney is a tubular structure, the ureter. In adults, each ureter is approximately 10 in. long. The ureters are muscular organs that provide a passage for urine from the kidneys to the urinary bladder with a flap of mucous membrane located at each distal end. The urinary bladder is a hollow, muscular structure located in the pelvic cavity.

Finally, is urethra, the final passageway urine passes through, leading to the exterior of the body through an opening known as the urinary meatus. In adult males, the urethra is approximately 6 in. long; in females, approximately 1½ in. long. Additionally, there are two sphincter muscles within the urethra: the internal and external sphincter. The internal sphincter, an involuntary muscle, is located at the base of the bladder.

END OF LESSON