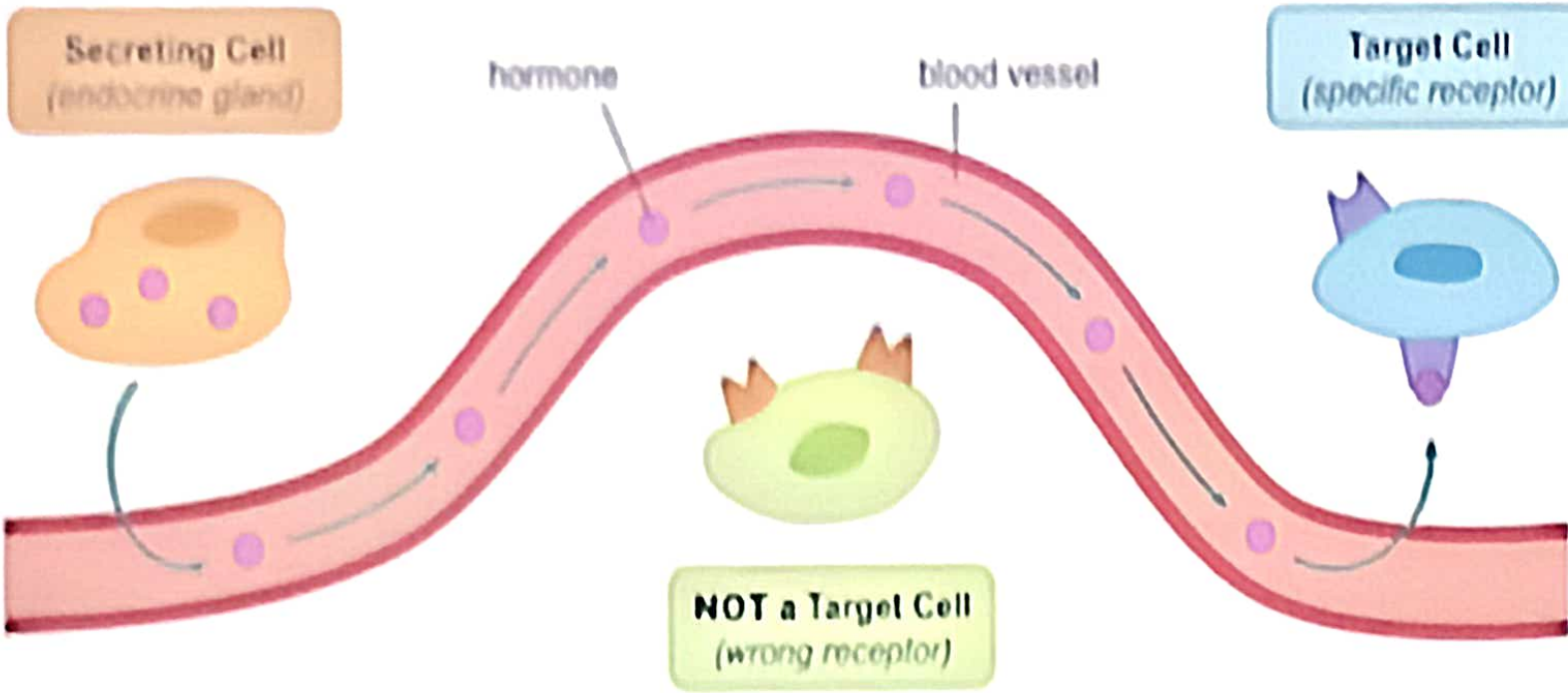
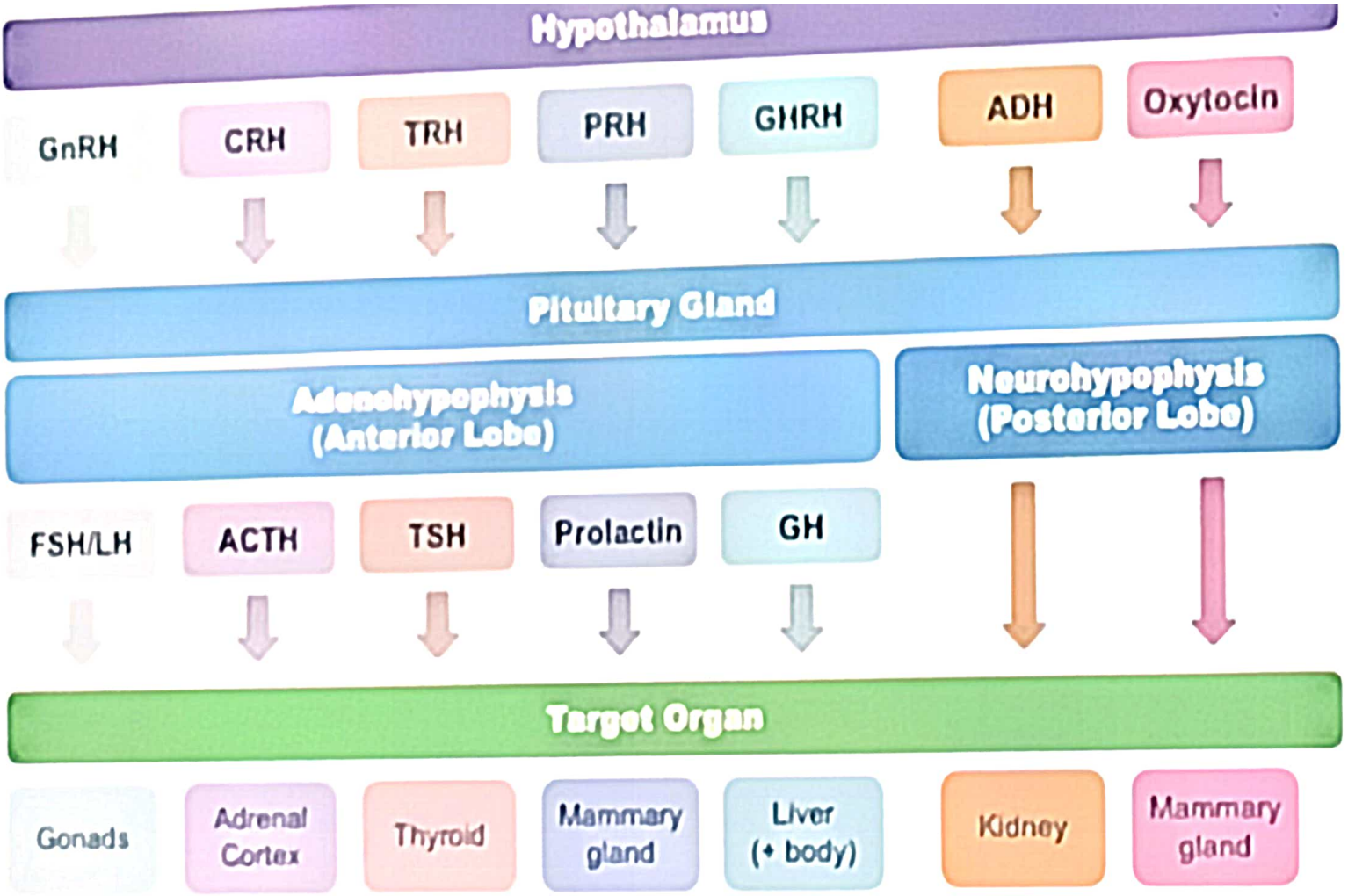
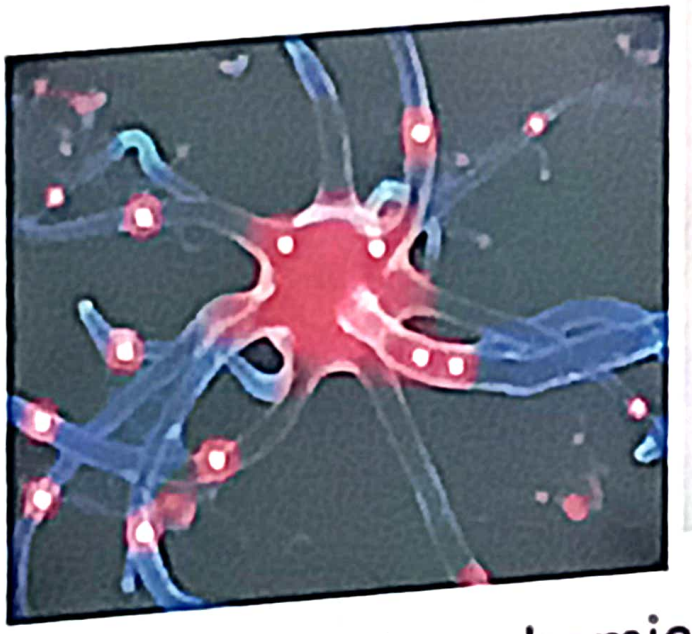

Secreting Cell
(endocrine gland)
hormone
blood vessel
Target Cell
(specific receptor)
NOT a Target Cell
(wrong receptor)

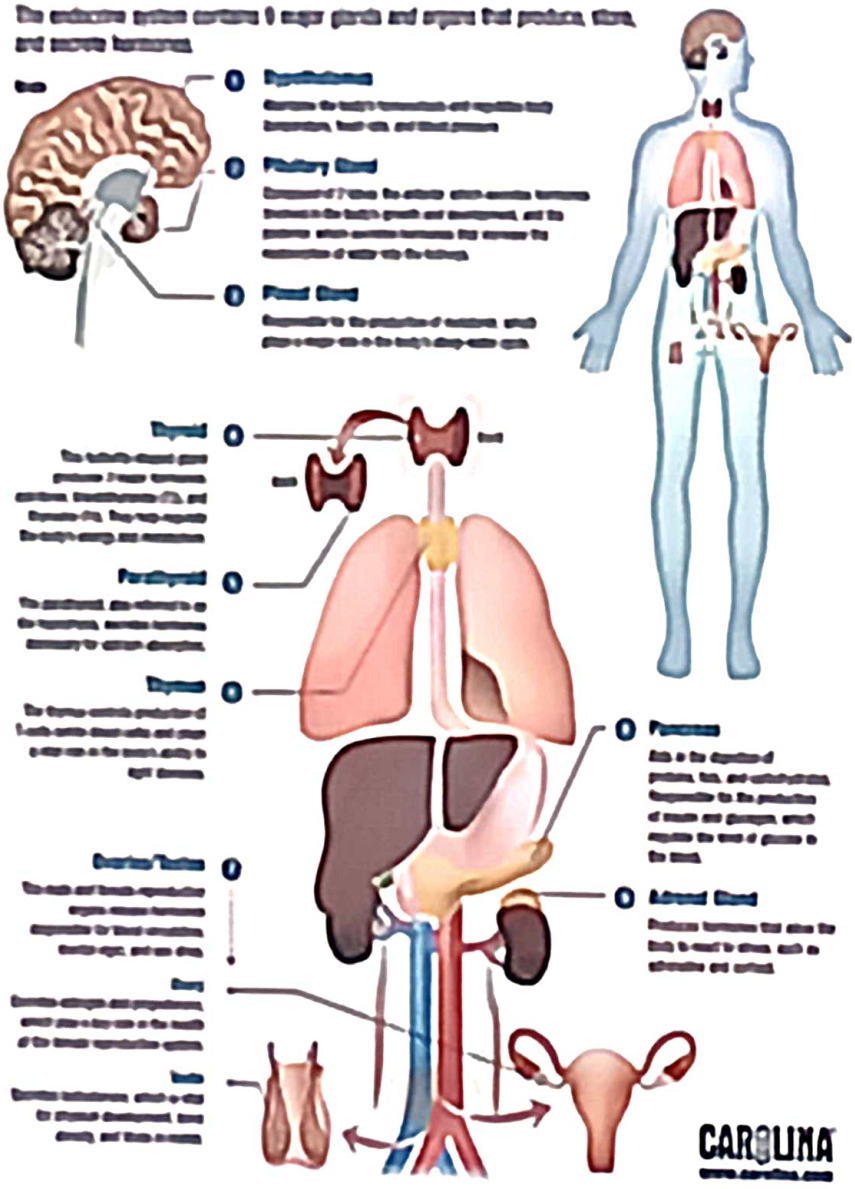

Hypothalamus
GnRH
CRH
TRH
PRH
GHRH
ADH
Oxytocin
Pituitary Gland
Adenohypophysis (Anterior Lobe)
Neurohypophysis (Posterior Lobe)
FSH/LH
ACTH
TSH
Prolactin
GH
Target Organ
Gonads
Adrenal Cortex
Thyroid
Mammary gland
Liver (+ body)
Kidney
Mammary gland

Hormones...



A hormone is a chemical transmitter. It is released in small amounts from glands, and is transported in the bloodstream to target organs or other cells. Hormones are chemical messengers, transferring information and instructions from one set of cells to another.

Human Body: Endocrine System



CAROLINA

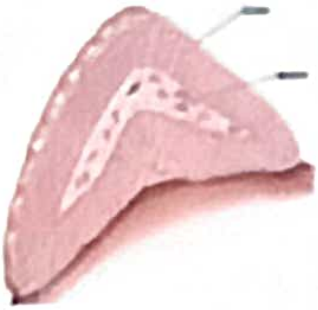
TABLE 10.2 Endocrine Glands, Hormones, and Their Target Tissues

Gland	Hormone	Target Tissue	Response
Pituitary gland			
Anterior	Growth hormone	Most tissues	Increases gene expression, breakdown of lipids, and release of fatty acids from cells; increases blood glucose levels
	Thyroid-stimulating hormone (TSH)	Thyroid gland	Increases thyroid hormone secretion (thyroxine and triiodothyronine)
	Adrenocorticotropic hormone (ACTH)	Adrenal cortex	Increases secretion of glucocorticoid hormones, such as cortisol; increases skin pigmentation at high concentrations
	Melanocyte-stimulating hormone (MSH)	Melanocytes in skin	Increases melanin production in melanocytes to make skin darker in color
	Luteinizing hormone (LH) or interstitial cell-stimulating hormone (ICSH)	Ovary in females, testis in males	Promotes ovulation and progesterone production in ovary; promotes testosterone synthesis and support for sperm cell production in testis
	Follicle-stimulating hormone (FSH)	Follicles in ovary in females, seminiferous tubules in males	Promotes follicle maturation and estrogen secretion in ovary; promotes sperm cell production in testis
	Prolactin	Ovary and mammary gland in females, testis in males	Stimulates milk production and prolongs progesterone secretion following ovulation and during pregnancy in women; increases sensitivity to LH in males
Posterior	Antidiuretic hormone (ADH)	Kidney	Conserves water; constricts blood vessels
	Oxytocin	Uterus	Increases uterine contractions
		Mammary gland	Increases milk letdown from mammary glands

TABLE 10.2 Endocrine Glands, Hormones, and Their Target Tissues

Gland	Hormone	Target Tissue	Response
Thyroid gland 	Thyroid hormones (thyroxine, triiodothyronine)	Most cells of the body	Increase metabolic rates, essential for normal process of growth and maturation
	Calcitonin	Primarily bone	Decreases rate of bone breakdown, prevents large increase in blood Ca^{2+} levels following a meal
Parathyroid glands 	Parathyroid hormone	Bone, kidney	Increases rate of bone breakdown by osteoclasts; increases vitamin D synthesis, essential for maintenance of normal blood calcium levels
Adrenal medulla 	Epinephrine mostly, some norepinephrine	Heart, blood vessels, liver, fat cells	Increases cardiac output; increases blood flow to skeletal muscles and heart; increases release of glucose and fatty acids into blood; in general, prepares body for physical activity
Adrenal cortex 	Mineralocorticoids (aldosterone)	Kidneys, to lesser degree, intestine and sweat glands	Increase rate of sodium transport into body; increase rate of potassium excretion; secondarily lower water retention
	Glucocorticoids (cortisol)	Most tissues (e.g., liver, fat, skeletal muscle, immune tissues)	Increase fat and protein breakdown; increase glucose synthesis from amino acids; increase blood nutrient levels; inhibit inflammation and immune response
	Adrenal androgens	Most tissues	Insignificant in males; increase female sexual drive, growth of pubic and axillary hair
Pancreas 	Insulin	Especially liver, skeletal muscle, adipose tissue	Increases uptake and use of glucose and amino acids
	Glucagon	Primarily liver	Increases breakdown of glycogen and release of glucose into the circulatory system

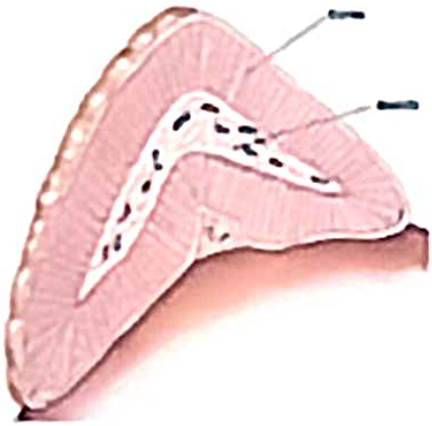
Secretions from the adrenal cortex...



Aldosterone: essential in regulating electrolyte and water balance by promoting sodium and chloride retention and potassium excretion.

Androgens: several hormones including testosterone; they promote the development of secondary sex characteristics in the male.

Secretions from the adrenal medulla...



- Place the victim in shock position
- Keep the person warm and comfortable
- Turn the victim's head to one side if neck injury is not suspected

Dopamine is used to treat shock. It dilates the arteries, elevates systolic blood pressure, increases cardiac output, and increases urinary output.

Secretions from the adrenal medulla...

Epinephrine is also called adrenalin. It elevates systolic blood pressure, increases heart rate and cardiac output, speeds up the release of glucose from the liver... giving a spurt of energy, dilates the bronchial tubes and relaxes airways, and dilates the pupils to see more clearly. It is often used to counteract an allergic reaction.

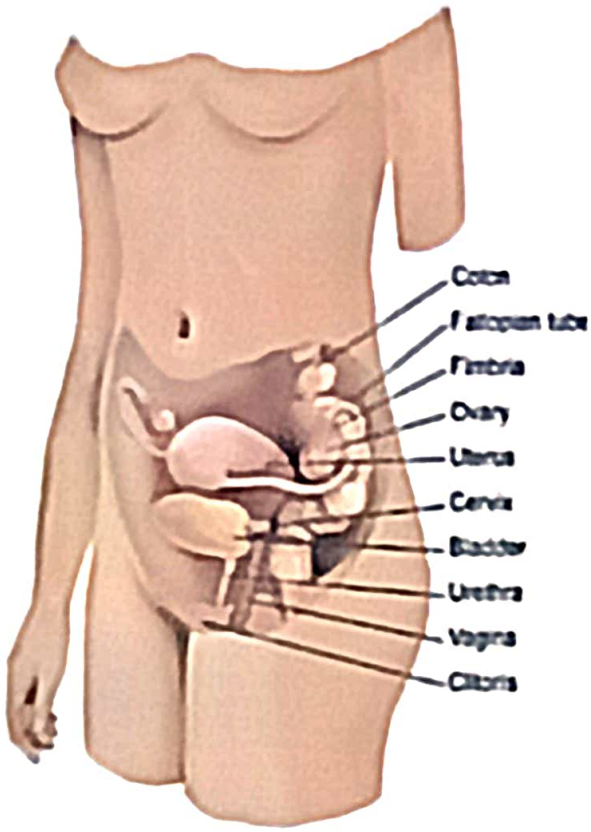
Secretions from the adrenal medulla...

Norepinephrine, like epinephrine, is released when the body is under stress. It creates the underlying influence in the *fight or flight response*.

Secretions of the ovaries...

The ovaries produce several **estrogen** hormones and **progesterone**. These hormones prepare the uterus for pregnancy, promote the development of mammary glands, play a role in sex drive, and develop secondary sex characteristics in the female.

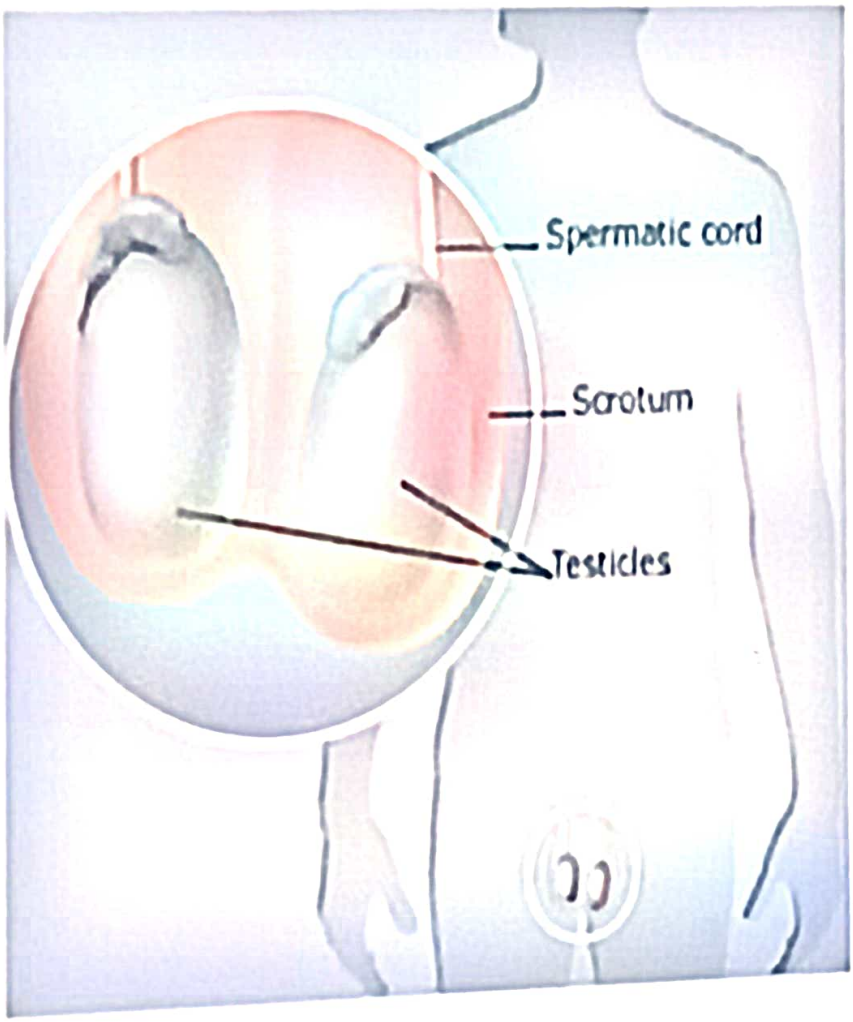
The Female Reproductive System



Estrogen is essential for the growth, development, and maintenance of female sex organs.

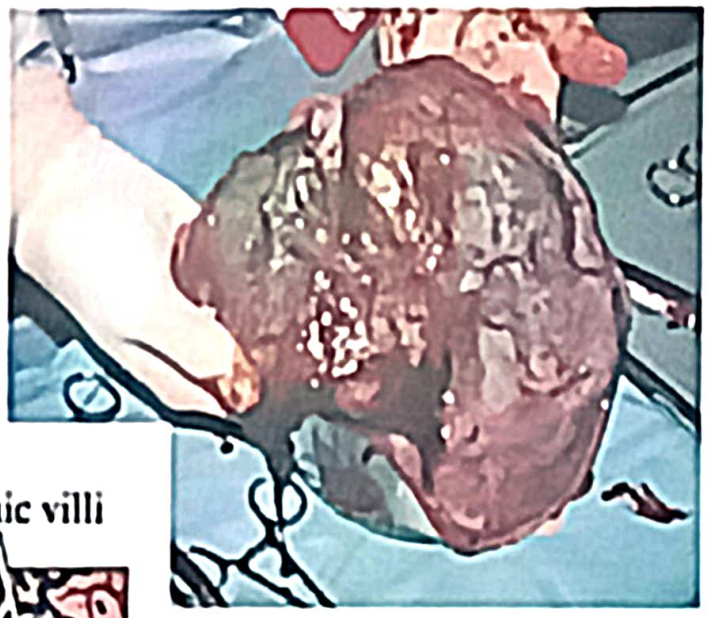
Secretions of the testes...

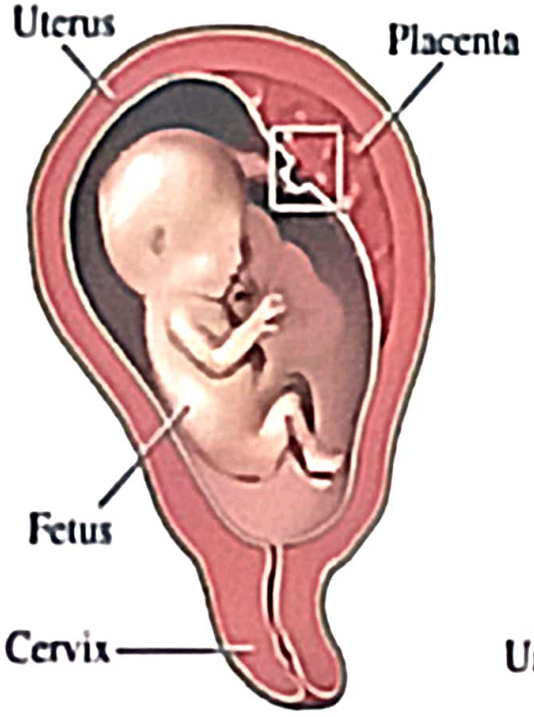
The testes produce the male sex hormone called **testosterone**. It is essential for normal growth and development of the male sex organs. Testosterone is responsible for the erection of the penis.

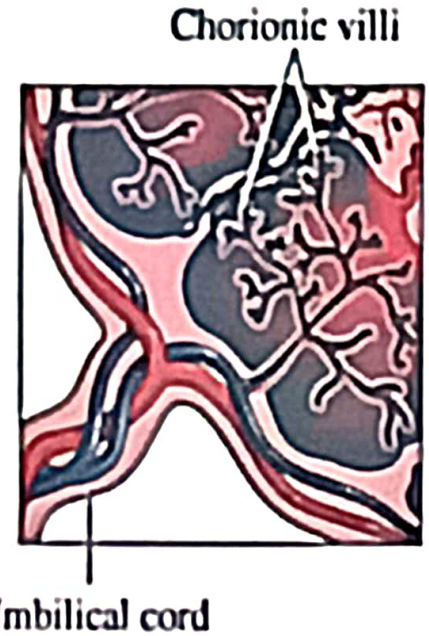


Secretions of the placenta...

During pregnancy, the placenta serves as an endocrine gland.



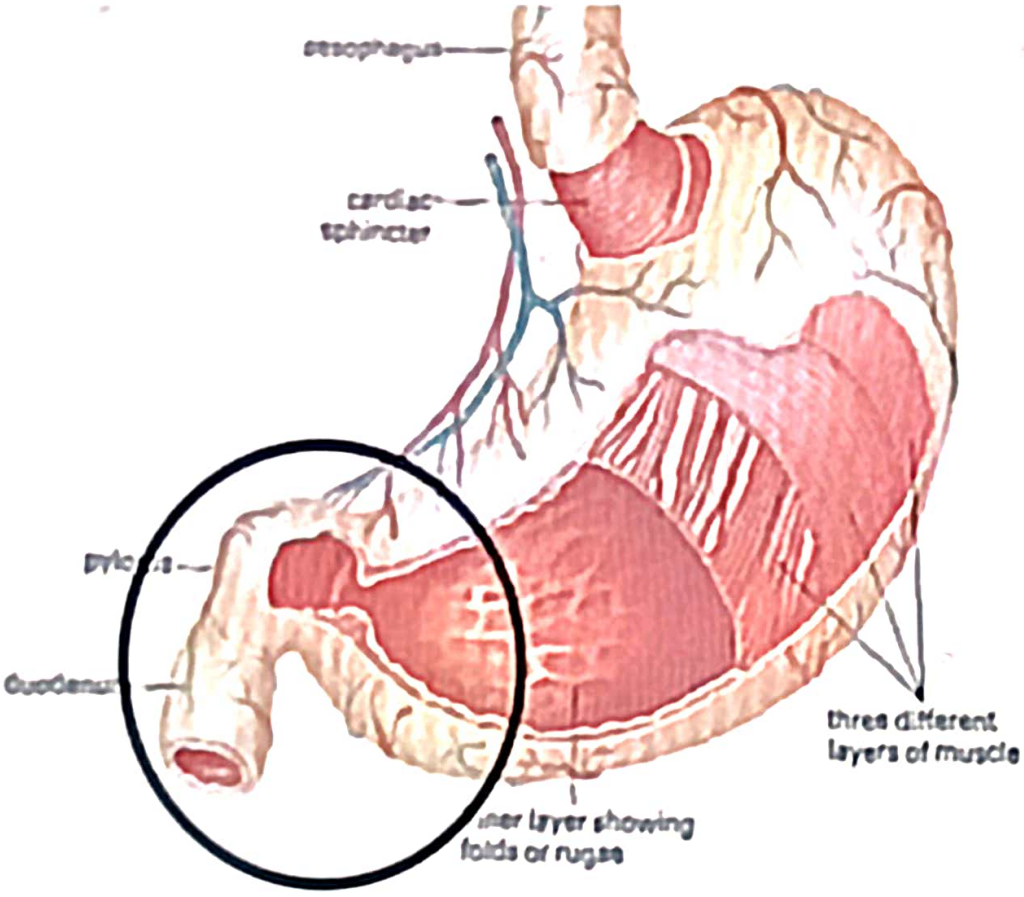




It produces chorionic **gonadotropin hormone, estrogen**, and **progesterone.**

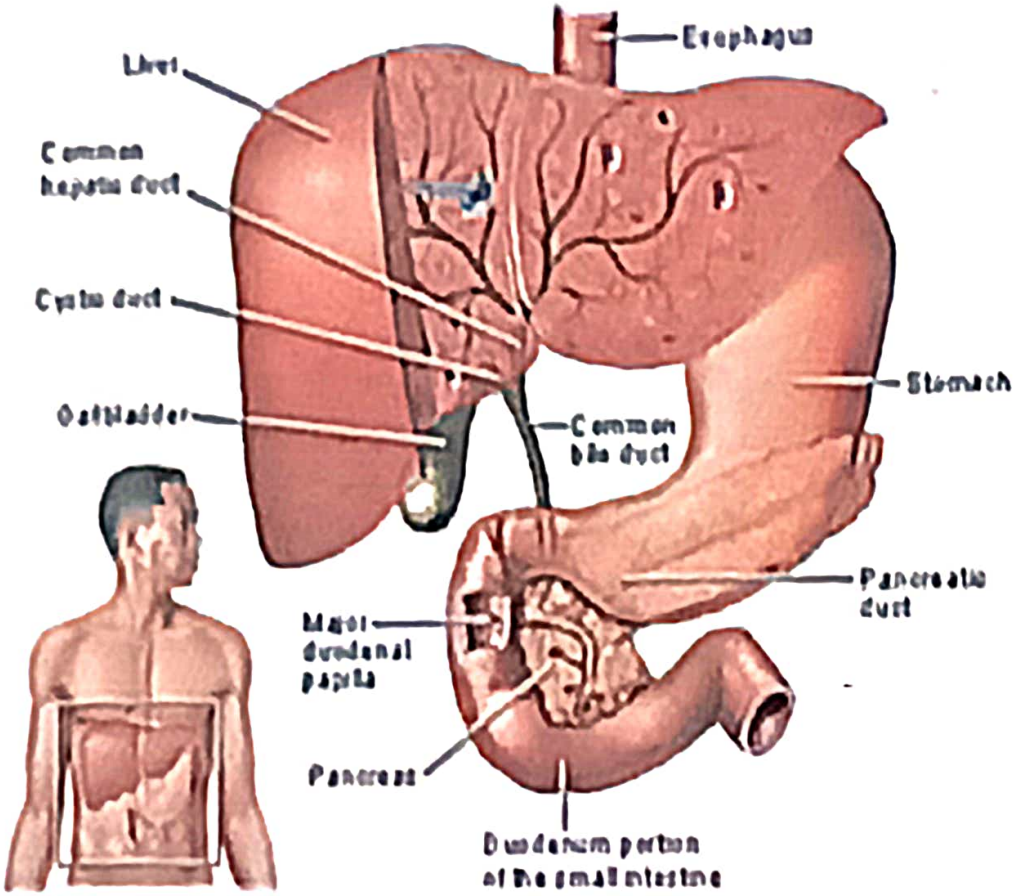
Secretions of the gastrointestinal mucosa...

The mucosa of the pyloric area of the stomach secretes the hormone **gastrin**, which stimulates the production of gastric acid for digestion.



Secretions of the gastrointestinal mucosa...

The mucosa of the duodenum and jejunum secretes the hormone **secretin**, which stimulates pancreatic juice, bile, and intestinal secretion.



Secretions of the thymus...

The thymus gland has two lobes, and is part of the lymphatic system. It is a ductless gland, and secretes **thymosin**. This is necessary for the Thymus' normal production of T cells for the immune system.