

INTRODUCTION

C, I: Use a very light color for C and a darker one for D (actually located on posterior surface of thyroid). (1) After coloring endocrine glands and tissues, color the scheme at lower left.

ENDOCRINE GLANDS:

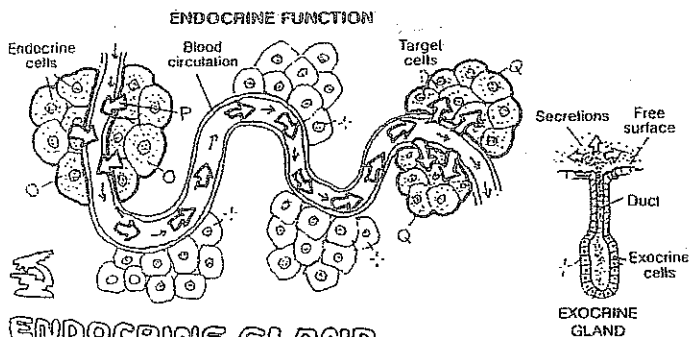
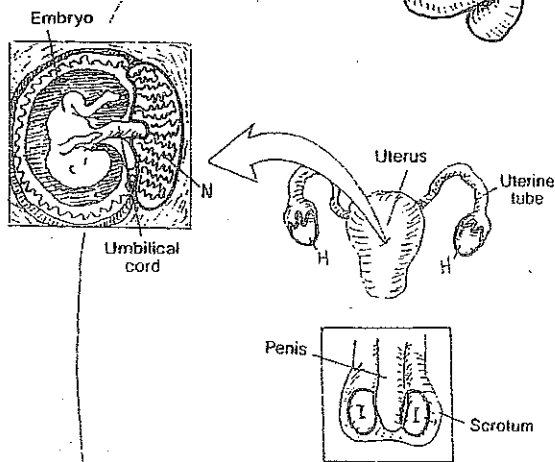
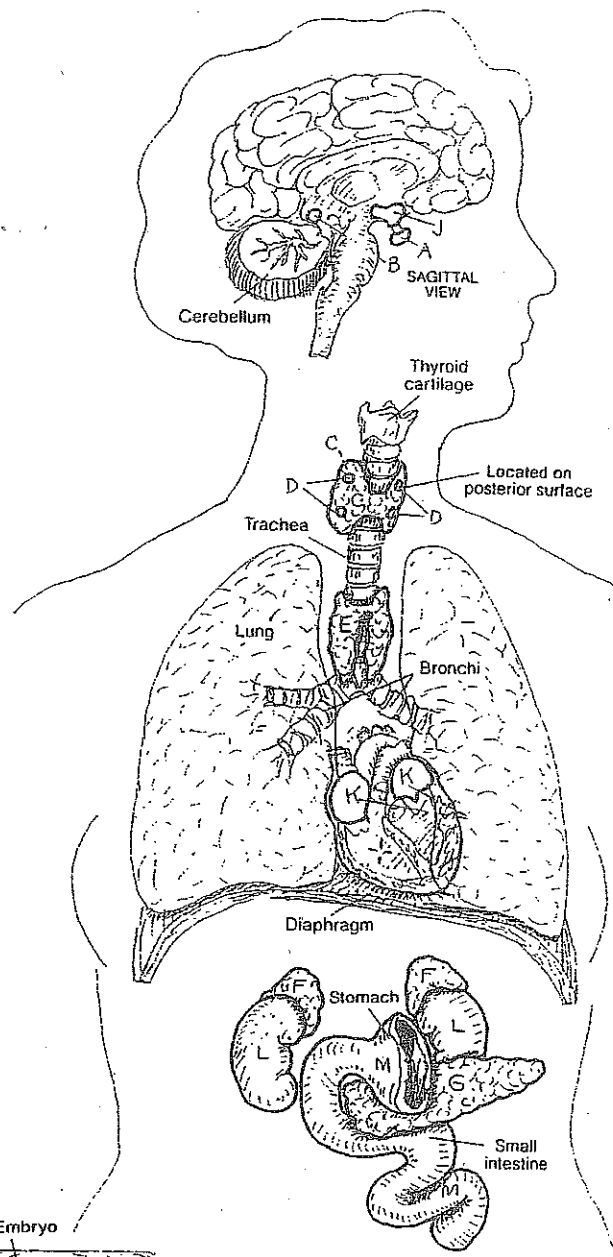
- HYPOPHYSIS (PITUITARY) A
- PINEAL B
- THYROID C
- PARATHYROID (4) D
- THYMUS E
- ADRENAL (SUPRARENAL) (2) F
- PANCREAS G
- OVARY (2) H
- TESTIS (2) I

ENDOCRINE TISSUES:

- HYPOTHALAMUS J
- HEART (ATRIA) K
- KIDNEY (2) L
- GASTROINTESTINAL TRACT M
- PLACENTA N

Endocrine glands and tissues are discrete masses of secretory cells and their supporting tissues in close proximity to blood capillaries, into which the cells secrete their hormones. The glands and tissues are ductless. Hormones are chemical agents usually effective among cells (target organs) located some distance from their source. Hormonal secretion results in negative or positive feedback control mechanisms. In the broader scope, hormonal activity results in growth, reproduction, and related activity as well as metabolic stability in the internal environment. Stability of the internal environment is called homeostasis.

The classical endocrine glands listed and shown here are presented in the following plates, with the exception of the pineal gland (see Plate 75) and the thymus (see Plate 124). Also listed here are just a few of the myriad tissues/cells that secrete chemical agents influential in cellular activities. The role of the hypothalamus can be colored in Plates 152 and 153. The atria of the heart secrete atrial natriuretic peptide (ANP) during periods of weak myocardial contraction, resulting in increased excretion of sodium and water. The juxtaglomerular cells of the kidney (Plate 150) secrete renin, an enzyme that converts angiotensinogen to angiotensin I and indirectly induces increased blood pressure and conservation of body fluids, such as during hemorrhage. Numerous endocrine factors secreted by cells of the gastrointestinal tract influence intestinal motility and enzyme secretion. The placenta secretes, among many hormones, human chorionic gonadotropin, which contributes to the support of embryonic growth during the first 90 days post-fertilization by stimulating the growth of the corpus luteum (Plates 161, 163, 165, 166).



ENDOCRINE GLAND.  
HORMONAL SECRETION.

**Table 10.1 Principal Endocrine Glands and Their Hormones**

Endocrine Gland	Hormone Released	Target Tissues/Organ	Chief Function of Hormone
Hypothalamus	Hypothalamic-releasing and release-inhibiting hormones	Anterior pituitary	Regulate anterior pituitary hormones
Posterior pituitary (storage of hypothalamic hormones)	Antidiuretic hormone (ADH), also known as vasopressin	Kidneys	Stimulates water reabsorption by kidneys
	Oxytocin	Uterus, mammary glands	Stimulates uterine muscle contraction and release of milk by mammary glands
Anterior pituitary	Growth hormone (GH), also known as somatotropin	Soft tissues, bones	Stimulates cell division, protein synthesis, and bone growth
	Prolactin (PRL)	Mammary glands	Stimulates milk production and secretion
	Thyroid-stimulating hormone (TSH)	Thyroid	Stimulates thyroid
	Adrenocorticotropic hormone (ACTH)	Adrenal cortex	Stimulates adrenal cortex
Thyroid	Gonadotropic hormones	Gonads (testes and ovaries)	Control gamete and sex hormone production
	Thyroxine	All tissues	Increases metabolic rate; helps to regulate growth and development
	Calcitonin	Bones, kidneys, intestine	Lowers blood calcium level
Parathyroids	Parathyroid hormone (PTH)	Bones, kidneys, intestine	Raises blood calcium level
Adrenal medulla	Epinephrine and norepinephrine	Cardiac and other muscles	Stimulate "fight-or-flight" reactions; raise blood glucose level
Adrenal cortex	Glucocorticoids* (e.g., cortisol)	All tissues	Raise blood glucose level
	Mineralocorticoids* (e.g., aldosterone)	Kidneys	Stimulate kidneys to reabsorb sodium and to excrete potassium
	Sex hormones	Sex organs, skin, muscles, bones	Stimulate development of secondary sex characteristics
Pancreas	Insulin	Liver, muscles, adipose tissue	Lowers blood glucose level
Testes	Glucagon	Liver, muscles, adipose tissue	Raises blood glucose level
	Androgens* (e.g., testosterone)	Sex organs, skin, muscles	Stimulate spermatogenesis; develop and maintain primary and secondary male sex characteristics
Ovaries	Estrogen and progesterone*	Sex organs, skin, muscles, bones	Stimulate oogenesis; develop and maintain primary and secondary female sex characteristics
Thymus	Thymosins	T lymphocytes	Stimulate maturation of T lymphocytes
Pineal gland	Melatonin	Various tissues	Involved in daily rhythms; possibly involved in maturation of sex organs

\*Steroid hormones