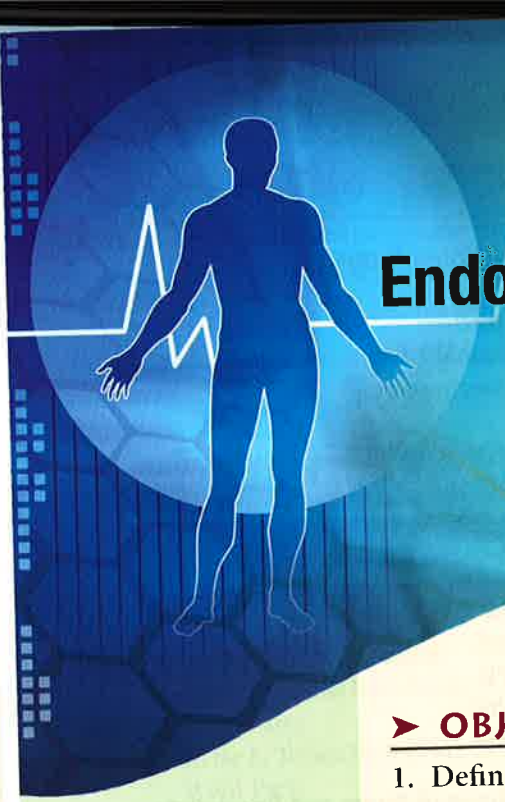

Endocrine System

LESSON 12

➤ OBJECTIVES

1. Define, build, pronounce, and spell medical terms built from word parts related to the endocrine system (p. 334).
2. Define, pronounce, and spell medical terms not built from word parts related to the endocrine system (p. 340).
3. Interpret the meaning of abbreviations related to the endocrine system (p. 342).
4. Use medical language in clinical statements and documents and review lesson content (p. 342).

INTRODUCTION TO THE ENDOCRINE SYSTEM

Endocrine System Organs and Related Anatomic Structures

adrenal gland (2)	gland that secretes adrenaline, one of which is located above each kidney (see Figure 12-1)
hormone	a chemical substance secreted by an endocrine gland that is carried by the blood to a target tissue
islets of Langerhans	clusters of endocrine tissue found throughout the pancreas, made up of different cell types that secrete the hormone insulin (see Figure 12-2)
metabolism	sum total of all the chemical processes that take place in a living organism

Endocrine System Organs and Related Anatomic Structures—cont'd	
pancreas	long organ that lies transversely across the upper abdomen that has a role in digestion as well as hormone secretion; contains the islets of Langerhans, which perform endocrine functions (See Figures 12-1 and 12-2)
pituitary gland	pea-sized gland located under the hypothalamus near the brain; often called the master gland because it regulates many of the other glands
thymus	lymphatic organ located behind the sternum; produces T cells and secretes a hormone that supports the immune system
thyroid gland	butterfly-shaped gland below the larynx on the front and sides of the trachea; secretes hormones that regulate the metabolism of carbohydrates, proteins, and fats

FUNCTIONS OF THE ENDOCRINE SYSTEM

- Regulates body activities
- Secretes hormones
- Influences growth, development, and metabolism

HOW THE ENDOCRINE SYSTEM WORKS

The endocrine system is made up of glands that secrete hormones assisting in the regulation of body activities (see Figure 12-1). The nervous system also regulates body activities but does so through nerve impulses. Nervous system regulation takes place quickly and the effects only last a short while. The endocrine system communicates through **hormones,** or chemical messengers, which take longer to produce results; however, the effects of endocrine system regulation usually last longer.

Hormones produced by endocrine glands are released directly into the bloodstream and are transported throughout the body. Target tissues are designed to respond to the specific hormone that influences their activities. Each endocrine gland secretes specialized hormones that affect various body systems. The **pituitary gland** is referred to as the master gland because it secretes several hormones that influence the activities of other endocrine glands.

➤ OBJECTIVE 1: Define, build, pronounce, and spell medical terms built from word parts related to the endocrine system.

WORD PARTS

Use the flashcards to familiarize yourself with the following word parts.

WR	WORD ROOT	DEFINITION
	adrenal	adrenal gland
	crin	to secrete
	dips	thirst
	glyc	glucose (sugar)
	thym	thymus gland
	thyroid	thyroid gland
S	**SUFFIX**	**DEFINITION**
	-ism	state of

EXERCISE A: LEARN WORD PARTS AND DEFINE MEDICAL TERMS

Cover the answer column on the left. Use Word Parts above to complete the exercises. Check your answers as you go by sliding the cover down the answer column. The terms you will work with in this exercise can be translated literally to find their meanings.

within
to secrete; to secrete
within

1. The prefix **endo-** means _____. The word root **crin** means _____. The term **endo/crin/e** means _____. The **-e** is a noun suffix with no meaning. The endocrine system secretes within, in that the glands of the endocrine system secrete hormones and release them directly into the bloodstream.

endo/crin/o/logy

endo/crin/o/logist

2. The **study of the endocrine system** is called _____/_____/_____/_____. The **specialist (physician) who studies and treats diseases of the endocrine system** is called an _____/_____/_____/_____.

3. Write the word roots for the endocrine system on Figure 12-1.

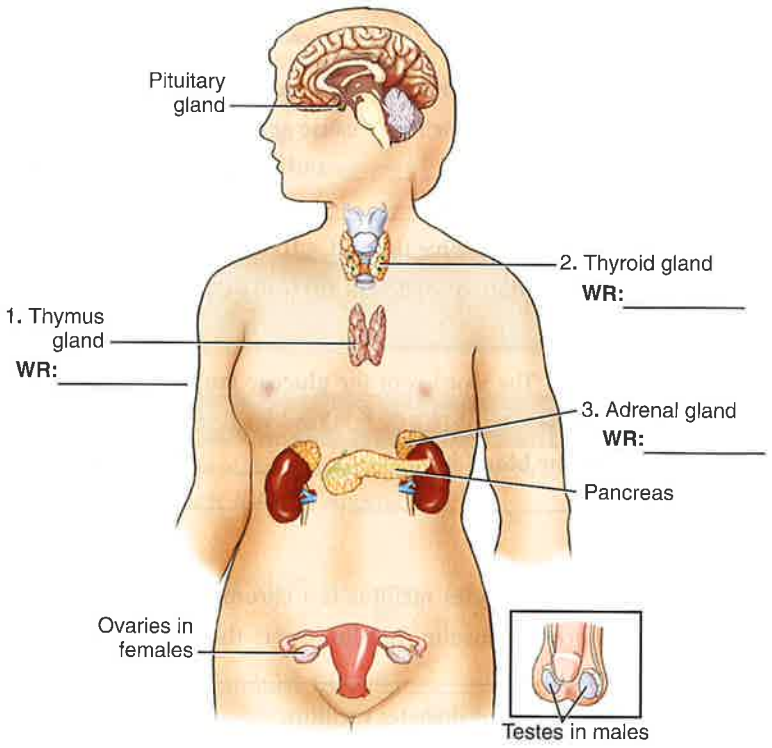

Figure 12-1 The endocrine system.

1. thym
2. thyroid
3. adrenal

4. The word root meaning **gland** is _____ (introduced in Lesson 7). The medical term meaning **tumor composed of glandular tissue** is _____/_____. An adenoma is a benign tumor. Translate the following terms:

aden
aden/oma

aden/osis _____

_____

abnormal condition of a gland

aden/o/megaly _____

enlargement of a gland

5. The word root **acr** means _____ (introduced in Lesson 1). **Acr/o/megaly,** or _____

_____, (and bones of the face, hands, and feet) is caused by excessive production of the growth hormone by the pituitary gland after puberty.

extremities
enlargement of the extremities

thyroid
thyroid/itis
excision

6. The thyroid gland is located in the neck region and produces hormones that are necessary for metabolism. The word root for thyroid gland is _____. The term meaning **inflammation of the thyroid gland** is _____/_____. **Thyroid/ectomy** means _____ of the thyroid gland.

hyper-; hypo-
state of
hyper/thyroid/ism
hypo/thyroid/ism

7. The thyroid gland can become either overactive (excessive) or underactive (deficient), which may cause abnormal conditions within the body. The prefix meaning **excessive** is _____, and the prefix meaning **deficient** is _____. **-ism** is the suffix meaning _____. Using these word parts, build the term that means **state of excessive thyroid activity** _____/_____/____ and the term that means **state of deficient thyroid activity** _____/_____/____.

glyc
-emia
glyc/emia; condition of deficient glucose in the blood

8. The word root for **glucose (sugar)** is _____, and the suffix meaning **blood condition** is _____. The medical term literally translated as **condition of glucose in the blood** is _____/_____. **Hypo/glyc/emia,** or _____ _____, can be a result of overproduction of insulin.

condition of excessive

9. Diabetes mellitus is a chronic disorder caused by insufficient production of the hormone insulin. Insulin lowers the levels of glucose in the blood. **Hyper/glyc/emia,** meaning _____ sugar in the blood, is a symptom of diabetes mellitus.

much
condition of
poly/dips/ia
poly/ur/ia

10. The prefix **poly-** means many, or _____. The suffix **-ia** means diseased state, or _____. Other common symptoms of diabetes mellitus are **condition of much thirst,** _____/_____/____, and **condition of much urine,** _____/_____/____.

excision of the thymus gland
pertaining to the thymus gland
tumor of the thymus gland

11. The thymus gland lies behind the sternum and plays an immunologic role in body function. Translate the following terms:

thym/ectomy _____

_____

thym/ic _____

_____

thym/oma _____

adrenal

adrenal/o/path/y

12. The adrenal glands are located above each kidney and produce hormones that affect body function. The word root for adrenal gland is _____. The medical term meaning (any) **disease of the adrenal gland** is _____/____/_____/____.

excision of the adrenal gland

inflammation of the adrenal gland

13. Translate the following terms:

adrenal/ectomy _____

_____

adrenal/itis _____

_____

FYI

The word root *thym* also means mind or emotion. For example, dysthymic disorder is a chronic mood disorder.

EXERCISE B: BUILD MEDICAL TERMS

Build the medical terms that match the definitions below. Refer to the Word Parts listed on p. 334 as needed. Answers are listed in Appendix D.

1. enlargement of the extremities _____/_____/_____
wr cv s

2. tumor composed of glandular tissue _____/_____
wr s

3. enlargement of a gland _____/_____/_____
wr cv s

4. abnormal condition of a gland _____/_____
wr s

5. excision of the adrenal gland _____/_____
wr s

6. inflammation of the adrenal gland _____/_____
wr s

7. (any) disease of the adrenal gland
_____/_____/_____/_____
wr cv wr s

8. to secrete within _____/_____/_____
p wr s

9. study of the endocrine system
_____/_____/_____/_____
p wr cv s

10. specialist (physician) who studies and treats diseases of the endocrine system
_____/_____/_____/_____
p wr cv s

11. condition of glucose in the blood _____/_____
wr s

12. condition of excessive glucose in the blood
_____/_____/_____
p wr s

13. state of excessive thyroid activity _____/_____/_____
p wr s

14. condition of deficient glucose in the blood _____/_____/_____
p wr s

15. state of deficient thyroid activity _____/_____/_____
p wr s

16. condition of much thirst _____/_____/_____
p wr s

17. condition of much urine _____/_____/_____
p wr s

18. excision of the thymus gland _____/_____
wr s

19. pertaining to the thymus gland _____/_____
wr s

20. tumor of the thymus gland _____/_____
wr s

21. excision of the thyroid gland _____/_____
wr s

22. inflammation of the thyroid gland _____/_____
wr s

EXERCISE C: PRONOUNCE AND SPELL MEDICAL TERMS BUILT FROM WORD PARTS

1. Say aloud the terms listed below. Refer to the Pronunciation Key on p. 15.

To hear the terms, access the Pronunciation activity on the student CD accompanying the textbook.

acromegaly	ak-rō-MEG-a-lē
adenoma	ad-e-NŌ-ma
adenomegaly	ad-e-nō-MEG-a-lē
adenosis	ad-e-NŌ-sis
adrenalectomy	ad-rē-nal-EK-to-mē
adrenalitis	a-drē-nal-Ī-tis
adrenalopathy	a-drē-nal-OP-a-thē
endocrine	EN-dō-krin
endocrinologist	en-dō-kri-NOL-o-jist
endocrinology	en-dō-kri-NOL-o-jē
glycemia	glī-SĒ-mē-a
hyperglycemia	hī-per-glī-SĒ-mē-a
hyperthyroidism	hī-per-THĪ-royd-izm
hypoglycemia	hī-pō-glī-SĒ-mē-a
hypothyroidism	hī-pō-THĪ-royd-izm
polydipsia	pol-ē-DIP-sē-a
polyuria	pol-ē-Ū-rē-a
thymectomy	thī-MEK-to-mē
thymic	THĪ-mik
thymoma	thī-MŌ-ma
thyroidectomy	thī-royd-EK-to-mē
thyroiditis	thī-royd-Ī-tis

2. Practice spelling the terms listed above by having them read to you. Use a separate piece of paper.

To hear and type the terms, access the Spelling activity on the student CD accompanying the textbook.

➤ OBJECTIVE 2: Define, pronounce, and spell medical terms not built from word parts related to the endocrine system.

The terms listed below may contain word parts, but are difficult to translate literally.

Medical Terms Not Built from Word Parts

Term	Definition	Abbreviation
Addison disease	chronic syndrome resulting from a deficiency in the hormonal secretion of the adrenal cortex	—
diabetes mellitus	chronic disease involving a disorder of carbohydrate metabolism caused by underactivity of the islets of Langerhans in the pancreas and resulting in insufficient production of insulin	DM
fasting blood sugar	a blood test to determine the amount of glucose (sugar) in the blood after fasting for 8 to 10 hours	FBS
goiter	enlargement of the thyroid gland (Figure 12-3)	—
Graves disease	a disorder of the thyroid gland characterized by the presence of hyperthyroidism, goiter, and exophthalmos (protrusion of the eyes)	—

FYI

DIABETES MELLITUS

Two major forms of diabetes mellitus are **type 1,** previously called *insulin-dependent diabetes mellitus (IDDM)* or *juvenile-onset diabetes,* and **type 2,** previously called *noninsulin-dependent diabetes mellitus (NIDDM)* or *adult-onset diabetes (AODM).* Long-term complications of both types of diabetes mellitus include neuropathy, which can lead to amputation, chronic renal disease, retinopathy, atherosclerosis, coronary artery disease, stroke, and peripheral artery disease.

Type 1 Diabetes Mellitus

Cause	the beta cells of the pancreas that produce insulin are destroyed and eventually no insulin is produced
Characteristics	abrupt onset, occurs primarily in childhood or adolescence. Patients often are thin.
Symptoms	polyuria, polydipsia, weight loss, hyperglycemia, acidosis, and ketosis
Treatment	insulin injections and diet

Type 2 Diabetes Mellitus

Cause	resistance of body cells to the action of insulin, which may eventually lead to a decrease in insulin secretion
Characteristics	slow onset, usually occurs in middle-aged or elderly adults. Most patients are obese.
Symptoms	fatigue, blurred vision, thirst, and hyperglycemia; may have neural or vascular complications
Treatment	diet, exercise, oral medication, and perhaps insulin

EXERCISE D: LEARN MEDICAL TERMS NOT BUILT FROM WORD PARTS

Cover the answer column on the left. Use the bolded words and phrases to guide you in filling in the blanks. Check your answers as you go by sliding the cover down the page.

fasting blood sugar

diabetes mellitus

1. Elevated results of a **blood test to determine the amount of glucose (sugar) in the blood after fasting for 8 to 10 hours,** or _____, indicate **chronic disease involving a disorder of carbohydrate metabolism caused by underactivity of the islets of Langerhans in the pancreas resulting in insufficient production of insulin,** or _____.

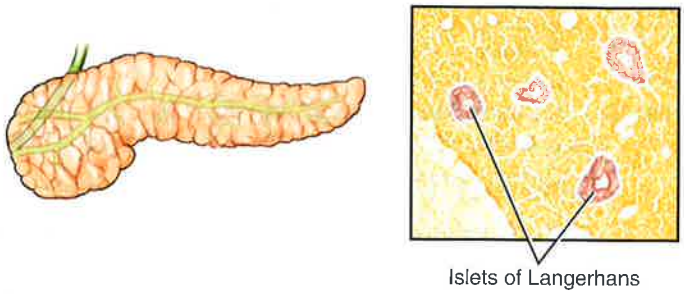

Figure 12-2 Pancreas, with islets of Langerhans.

goiter

2. Simple **enlargement of the thyroid gland,** or _____, may occur when the thyroid gland cannot produce enough hormones to meet the body's needs (Figure 12-3). If symptoms become significant, such as breathing difficulties, a thyroidectomy may be performed.

FYI

Goiter may be caused by Graves disease, thyroiditis, or a thyroid nodule, which is a lump on the thyroid gland. Goiter is a general term for the enlargement of the thyroid gland.

Figure 12-3 Goiter.

Graves disease

3. Goiter may also be a symptom of **a(n) disorder of the thyroid gland characterized by the presence of hyperthyroidism, goiter, and exophthalmos** _____.

Addison disease

4. A patient with a diagnosis of **chronic syndrome resulting from a deficiency in the hormonal secretion of the adrenal cortex,** or _____, may have weakness, darkening of skin, loss of appetite, and/or depression.

EXERCISE E: PRONOUNCE AND SPELL MEDICAL TERMS NOT BUILT FROM WORD PARTS

1. Say aloud the terms listed below. Refer to the Pronunciation Key on p. 15.

To hear the terms, access the Pronunciation activity on the student CD accompanying the textbook.

AD-di-son di-ZĒZ — Addison disease
dī-a-BĒ-tēz mel-LĪ-tus — diabetes mellitus
FAS-ting blud SHU-gar — fasting blood sugar
GOY-ter — goiter
grāvz di-ZĒZ — Graves disease

2. Practice spelling the terms listed above by having them read to you. Use a separate piece of paper.

To hear and type the terms, access the Spelling activity on the student CD accompanying the textbook.

➤ OBJECTIVE 3: Interpret the meaning of abbreviations related to the endocrine system.

EXERCISE F: IDENTIFY ABBREVIATIONS

Write the abbreviations for the following medical terms.

Medical Term	Abbreviation
diabetes mellitus	DM
fasting blood sugar	FBS

➤ OBJECTIVE 4: Use medical language in clinical statements and documents and review lesson content.

EXERCISE G: INTERACT WITH MEDICAL DOCUMENTS

Complete the history and physical by writing the medical terms in the blanks using the list of definitions with the corresponding numbers following the document. Answers are listed in Appendix D.

University Hospital and Medical Center
4700 North Main Street • Wellness, Arizona 54321 • (987) 555-3210

PATIENT NAME: Jane Nelson
DATE OF BIRTH: 05/21/19XX
CASE NUMBER: 021286-END
DATE: 06/20/20XX

HISTORY AND PHYSICAL

CHIEF COMPLANT: Jane Nelson is a 33-year-old Caucasian female presenting with an episode of syncope at work, complaining of excessive urination and thirst and fatigue for approximately 1 month.

HISTORY OF PRESENT ILLNESS: For the past 4 weeks she has been having 1. _____ and 2. _____, drinking 3 to 4 quarts of water daily for the past 10 days. This has also resulted in nocturia, getting up 2 to 3 times a night to void. She denies anorexia, nausea, vomiting, hematemesis, or any abdominal pain.

MEDICAL HISTORY: No known allergies. No previous hospitalizations. She does not smoke or drink. She has had no recent illness.

FAMILY HISTORY: Mother died of a 3. _____ at age 78. Father is still living at the age of 85, but has had 4. _____ for 20 years. She has two brothers, both in good health, and no sisters.

SOCIAL HISTORY: Unmarried without children. She does not smoke and uses alcohol rarely.

REVIEW OF SYSTEMS: She denies fever, chills, headache, palpitations, chest pain, or edema.

PHYSICAL EXAM: Temperature, 98.9°F. Pulse, 80. Respirations, 24. Her blood pressure is 125/80 mm Hg. Her weight is 143 pounds, down 10 pounds since her last routine visit 3 months ago. **HEENT:** Normal. **CHEST:** Clear to auscultation and percussion. **HEART:** Regular rhythm. No murmurs or extra heart sounds. **ABDOMEN:** Soft, nontender, bowel sounds normal, without evidence of organomegaly. **RECTAL:** Unremarkable. **EXTREMITIES:** No 5. _____, clubbing, or edema. Pedal pulses are intact. **NEUROLOGIC:** Alert and oriented to time, person, and place. Cranial nerves 2 through 12 are grossly intact.

LABORATORY FINDINGS: Random blood sugar was discovered to be greater than 600 mg/dL. Urinalysis showed moderate ketonuria. Guaiac was negative.

ASSESSMENT: Diabetic ketosis most likely caused by type 1 diabetes mellitus.

PLAN: Administer IV fluids and insulin. Schedule 6. _____ consult for this afternoon for complete diagnosis and treatment.

_____
Christina Kraemer, MD

CK/mcm

1. condition of much urine
2. condition of much thirst
3. interruption of blood supply to a region of the brain

4. chronic disease involving a disorder of carbohydrate metabolism resulting in insufficient production of insulin

5. abnormal condition of blue (bluish discoloration of skin)

6. study of the endocrine system

EXERCISE H: USE MEDICAL TERMS

Insert the medical term for phrases in bold. Answers are listed in Appendix D.

1. Two types of **chronic disease resulting in insufficient production of insulin,** or _____, are type 1, in which the onset is abrupt and occurs primarily in childhood or adolescence, and type 2, in which the onset is slow and usually occurs in middle aged or elderly adults. The cause of diabetes mellitus is a decrease in the hormone insulin, resulting in **excessive glucose in the blood,** or _____.

The **specialist (physician) who studies and treats diseases of the endocrine system,** or _____, uses a positive **blood test to determine the amount of glucose (sugar) in the blood,** or _____, to confirm the presence of this disease.

2. Excessive insulin in the blood causes **deficient glucose in the blood,** or _____.

3. **Pertaining to the thymus gland** _____ hypoplasia is a congenital condition caused by the absence or underdevelopment of the thymus gland.

4. Graves disease is a condition of **state of excessive thyroid activity** _____, whereas cretinism is a condition of **state of deficient thyroid activity** _____.

EXERCISE I: REVIEW

Answers are listed in Appendix D.

Word Root	Definition

Write the word root for the definitions.

1. _____ adrenal gland
2. _____ to secrete
3. _____ thirst
4. _____ glucose
5. _____ thymus gland
6. _____ thyroid gland

Suffix Definition

Write the suffix for the definition listed.

1. _____ state of

Medical Terms Built from Word Parts

Write the definition of the medical terms listed.

1. acromegaly _____
2. adenoma _____
3. adenomegaly _____
4. adenosis _____
5. adrenalectomy _____
6. adrenalitis _____
7. adrenalopathy _____
8. endocrine _____
9. endocrinologist _____
10. endocrinology _____
11. glycemia _____
12. hyperglycemia _____
13. hyperthyroidism _____
14. hypoglycemia _____
15. hypothyroidism _____
16. polydipsia _____
17. polyuria _____
18. thymectomy _____
19. thymic _____
20. thymoma _____
21. thyroidectomy _____

Medical Terms Not Built from Word Parts

Write the definition of the medical terms listed.

1. Addison disease _____
2. diabetes mellitus _____
3. fasting blood sugar _____
4. goiter _____
5. Graves disease _____

Abbreviations

Write the abbreviation for the medical terms defined.

1. chronic disease involving a disorder of carbohydrate metabolism _____
2. a blood test to determine the amount of glucose in the blood after fasting _____

EXERCISE J: REVIEW ON CD

For continued review, access Pronunciation and Spelling, Activities, Games, and Animations on the student CD accompanying the textbook. Place checkmarks in the boxes when you have completed the following:

Pronunciation and Spelling
- ❑ Exercise C: Terms Built from Word Parts
- ❑ Exercise E: Terms Not Built from Word Parts

Activities
- ❑ Picture It
- ❑ Word Part Review
- ❑ Build Medical Terms
- ❑ Word Shop
- ❑ Use Medical Language

Games
- ❑ Name that Word Part
- ❑ Term Explorer

Animation
- ❑ Adrenal Function

LESSON AT A GLANCE: ENDOCRINE SYSTEM

Signs and Symptoms
hyperglycemia
hypoglycemia
polydipsia
polyuria

Diseases and Disorders
acromegaly
Addison disease
adenoma
adenomegaly
adenosis
adrenalitis
adrenalopathy
diabetes mellitus (DM)
goiter
Graves disease
hyperthyroidism
hypothyroidism
thymoma
thyroiditis

Diagnostic Tests and Equipment
fasting blood sugar (FBS)

Surgical Procedures
adrenalectomy
thymectomy
thyroidectomy

Related Terms
endocrine
glycemia
thymic

Abbreviations
DM
FBS

Areas of Study and Specialists
endocrinologist
endocrinology

WEBLINK

For more information about diseases and disorders affecting the endocrine system visit the Stanford Health Library at http://healthlibrary.stanford.edu. Select **Health Conditions,** then **Endocrine System.**