

Integumentary System

CHAPTER

5

Chapter Outline

Objectives

Anatomy and Physiology

Anatomy and Physiology Key Terms

Skin

Epidermis

Dermis

Accessory Organs of the Skin

Glands

Hair

Nails

Connecting Body Systems—Integumentary System

Medical Word Elements

Combining Forms

Suffixes

Prefixes

Pathology

Skin Lesions

Burns

Oncology

Grading and Staging Systems

Basal Cell Carcinoma

Squamous Cell Carcinoma

Malignant Melanoma

Diagnostic, Symptomatic, and Related Terms

Diagnostic and Therapeutic Procedures

Pharmacology

Abbreviations

Learning Activities

Medical Record Activities

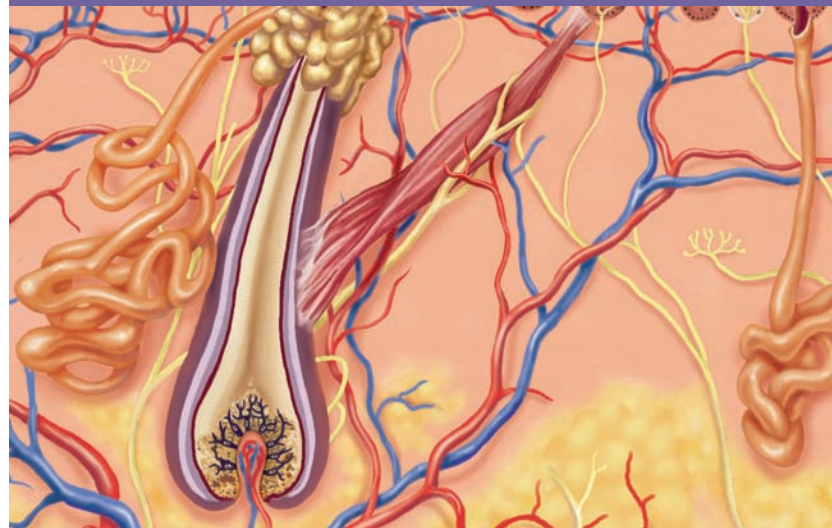
Pathology report: Skin lesion

Patient referral letter: Onychomycosis

Objectives

Upon completion of this chapter, you will be able to:

- Locate the major organs of the integumentary system and describe their structure and function.
- Describe the functional relationship between the integumentary system and other body systems.
- Pronounce, spell, and build words related to the integumentary system.
- Describe pathological conditions, diagnostic and therapeutic procedures, and other terms related to the integumentary system.
- Explain pharmacology associated with the treatment of skin disorders.
- Demonstrate your knowledge of this chapter by completing the learning and medical record activities.



Anatomy and Physiology

The skin, also called *integument*, is the largest organ in the body. Together with its accessory organs (hair, nails, and glands), the skin makes up the **integumentary system**. Its elaborate system of distinct tissues includes glands that produce several types of secretions, nerves that transmit impulses, and blood vessels that help regulate body temperature. The skin covers and protects all outer surfaces of the body and performs many vital functions, including the sense of touch. (See Figure 5–1.)

Skin

The skin protects underlying structures from injury and provides sensory information to the brain. Beneath the skin's surface is an intricate network of nerve fibers that register sensations of temperature, pain, and pressure. Other important functions of the skin include protecting the body

against ultraviolet rays, regulating body temperature, and preventing dehydration. The skin also acts as a reservoir for food and water. It also **synthesizes** vitamin D when exposed to sunlight. The skin consists of two distinct layers: the epidermis and the dermis. A subcutaneous layer of tissue binds the skin to underlying structures.

Epidermis

The outer layer, the (1) **epidermis**, is relatively thin over most areas but is thickest on the palms of the hands and the soles of the feet. Although the epidermis is composed of several sublayers called **strata**, the (2) **stratum corneum** and the (3) **basal layer**, which is the deepest layer, are of greatest importance.

The stratum corneum is composed of dead flat cells that lack a blood supply and sensory receptors. Its thickness is correlated with normal wear of the area it covers. The basal layer is the only layer of the epidermis that is composed of living cells

Anatomy and Physiology Key Terms

This section introduces important terms, along with their definitions and pronunciations. Word analyses for selected terms are also provided.

Term	Definition
androgen ĂN-drō-jĕn	Generic term for an agent (usually a hormone, such as testosterone and androsterone) that stimulates development of male characteristics
ductule DŪK-tŭl <i>duct</i> : to lead; carry <i>-ule</i> : small, minute	Very small duct
homeostasis hō-mē-ō-STĀ-sĭs <i>homeo-</i> : same, alike <i>-stasis</i> : standing still	State in which the regulatory mechanisms of the body maintain an internal environment within tolerable levels, despite changes in the external environment <i>The regulatory mechanisms of the body control temperature, acidity, and the concentration of salt, food, and waste products.</i>
scrotum SKRŌ-tŭm	Pouch of skin in the male that contains the testicles
synthesis SĪN-thĕs-ĭs	Formation of a complex substance by the union of simpler compounds or elements <i>Skin synthesizes vitamin D (needed by bones for calcium absorption).</i>
synthesize SĪN-thĕ-sĭz	To produce by synthesis
Pronunciation Help	Long Sound ā—rate ē—rebirth ĩ—isle ō—over ū—unite Short Sound ă—alone ě—ever ĭ—it ȏ—not ŭ—cut

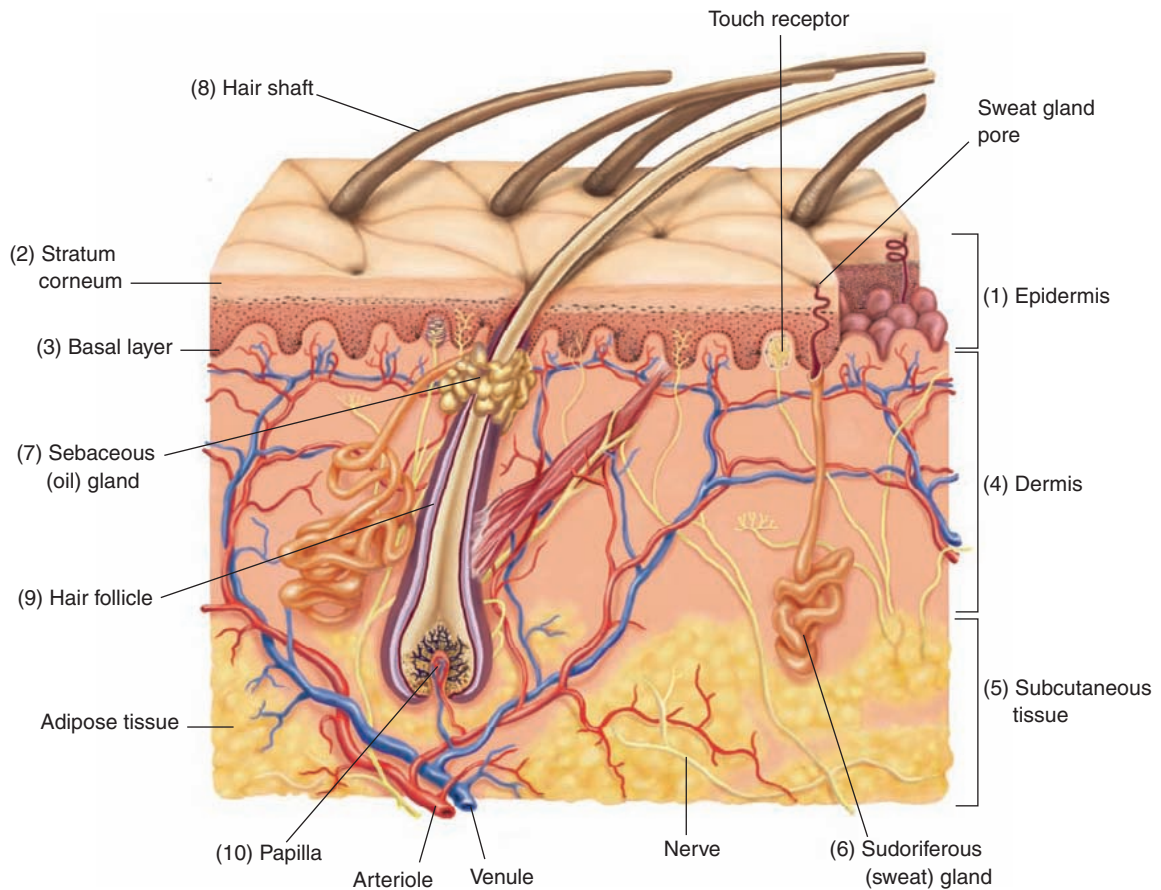


Figure 5-1. Structure of the skin and subcutaneous tissue.

where new cells are formed. As these cells move toward the stratum corneum to replace the cells that have been sloughed off, they die and become filled with a hard protein material called **keratin**. The relatively waterproof characteristic of keratin prevents body fluids from evaporating and moisture from entering the body. The entire process by which a cell forms in the basal layer, rises to the surface, becomes keratinized, and sloughs off takes about 1 month.

In the basal layer, special cells called **melanocytes** produce a black pigment called **melanin**. Melanin provides a protective barrier from the damaging effects of the sun's ultraviolet radiation, which can cause skin cancer. Moderate sun exposure increases the rate of melanin production and results in a suntan. However, overexposure results in sunburn due to melanin's inability to absorb sufficient ultraviolet rays to prevent the burn.

Differences in skin color are attributed to the amount of melanin in each cell. Dark-skinned people produce large amounts of melanin and are less likely to have wrinkles or skin cancer.

Production of melanocytes is genetically regulated and, thus, inherited. Local accumulations of melanin are seen in pigmented moles and freckles. An absence of pigment in the skin, eyes, and hair is most likely due to an inherited inability to produce melanin. An individual who cannot produce melanin has a marked deficiency of pigment in the eyes, hair, and skin and is known as an **albino**.

Dermis

The second layer of the skin, the (4) **dermis**, also called **corium**, lies directly beneath the epidermis. It is composed of living tissue and contains numerous capillaries, lymphatic vessels, and nerve endings. Hair follicles, **sebaceous** (oil) glands, and **sudoriferous** (sweat) glands are also located in the dermis.

The (5) **subcutaneous layer**, also called **hypodermis**, binds the dermis to underlying structures. It is composed primarily of loose connective tissue and **adipose** (fat) tissue interlaced with blood vessels. The subcutaneous layer stores fats, insulates and cushions the body, and regulates temperature.

The amount of fat in the subcutaneous layer varies with the region of the body and sex, age, and nutritional state.

Accessory Organs of the Skin

The accessory organs of the skin consist of integumentary glands, hair, and nails. The glands play an important role in defending the body against disease and maintaining **homeostasis**, whereas the hair and nails have more limited functional roles.

Glands

Two important glands located in the dermis produce secretions: the (6) **sudoriferous (sweat) glands** produce sweat and the (7) **sebaceous (oil) glands** produce oil. These two glands are **exocrine glands** because they secrete substances through ducts to an outer surface of the body rather than directly into the bloodstream.

The sudoriferous glands secrete perspiration, or sweat, onto the surface of the skin through pores. Pores are most plentiful on the palms, soles, forehead, and **axillae** (armpits). The main functions of the sudoriferous glands are to cool the body by evaporation, excrete waste products, and moisten surface cells.

The sebaceous glands are filled with cells, the centers of which contain fatty droplets. As these cells disintegrate, they yield an oily secretion called **sebum**. The acidic nature of sebum helps destroy harmful organisms on the skin, thus preventing infection. When **ductules** of the sebaceous glands become blocked, acne may result. Congested sebum causes formation of pimples or whiteheads. If the sebum is dark, it forms blackheads. Sex hormones, particularly **androgens**, regulate production and secretion of sebum. During

adolescence, secretions increase; as the person ages, secretions diminish. The loss of sebum, which lubricates the skin, may be one of the reasons for the formation of wrinkles that accompany old age. Sebaceous glands are present over the entire body except on the soles of the feet and the palms of the hands. They are especially prevalent on the scalp and face; around such openings as the nose, mouth, external ear, and anus; and on the upper back and **scrotum**.

Hair

Hair is found on nearly all parts of the body except for the lips, nipples, palms of the hands, soles of the feet, and parts of the external genitalia. The visible part of the hair is the (8) **hair shaft**; the part that is embedded in the dermis is the hair root. The root, together with its coverings, forms the (9) **hair follicle**. At the bottom of the follicle is a loop of capillaries enclosed in a covering called the (10) **papilla**. The cluster of epithelial cells lying over the papilla reproduces and is responsible for the eventual formation of the hair shaft. As long as these cells remain alive, hair will regenerate even if it is cut, plucked, or otherwise removed. **Alopecia** (baldness) occurs when the hairs of the scalp are not replaced because of death of the papillae (singular, *papilla*).

Like skin color, hair color is related to the amount of pigment produced by epidermal melanocytes. Melanocytes are found at the base of the hair follicle. Melanin ranges in color from yellow to reddish brown to black. Varying amounts of melanin produce hair ranging in color from blond to brunette to black; the more abundant the melanin, the darker the hair. Heredity and aging affect melanin levels. A decrease or an absence of melanin causes loss of hair color.

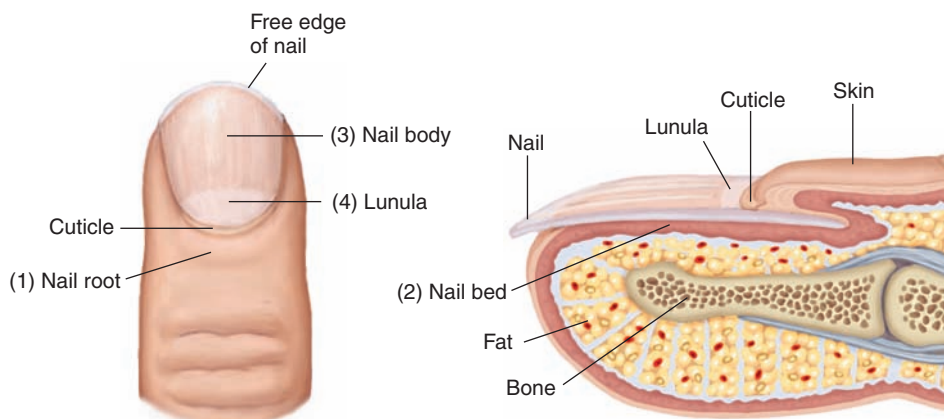


Figure 5-2. Structure of a fingernail.

Connecting Body Systems–Integumentary System

The main function of the skin is to protect the entire body, including all of its organs, from the external environment. Specific functional relationships between the skin and other body systems are summarized below.



Blood, lymph, and immune

- Skin is the first line of defense against the invasion of pathogens in the body.



Cardiovascular

- Cutaneous blood vessels dilate and constrict to help regulate body temperature.



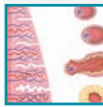
Digestive

- Skin absorbs vitamin D (produced when skin is exposed to sunlight) needed for intestinal absorption of calcium.
- Excess calories are stored as subcutaneous fat.



Endocrine

- Subcutaneous layer of the skin stores adipose tissue when insulin secretions cause excess carbohydrate intake to fat storage.



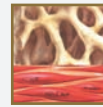
Female Reproductive

- Subcutaneous receptors provide pleasurable sensations associated with sexual behavior.
- Skin stretches to accommodate the growing fetus during pregnancy.



Genitourinary

- Receptors in the skin respond to sexual stimuli.
- Skin provides an alternative route for excreting salts and nitrogenous wastes in the form of perspiration.



Musculoskeletal

- Skin synthesizes vitamin D needed for absorption of calcium essential for muscle contraction.
- Skin also synthesizes vitamin D needed for growth, repair, and maintenance of bones.



Nervous

- Cutaneous receptors detect stimuli related to touch, pain, pressure, and temperature.



Respiratory

- Skin temperature may influence respiratory rate. As temperature increases, respiratory rate may also increase.
- Hairs of the nasal cavity filter particles from inspired air before it reaches the lower respiratory tract.



It is time to review anatomy by completing Learning Activity 5–1.

Nails

Nails protect the tips of the fingers and toes from bruises and injuries. (See Figure 5–2.) Each nail is formed in the (1) **nail root** and is composed of keratinized stratified squamous epithelial cells producing a very tough covering. As the nail grows, it stays attached and slides forward over the layer of epithelium called the (2) **nail bed**.

This epithelial layer is continuous with the epithelium of the skin. Most of the (3) **nail body** appears pink because of the underlying vascular tissue. The half-moon-shaped area at the base of the nail, the (4) **lunula**, is the region where new growth occurs. The lunula has a whitish appearance because the vascular tissue underneath does not show through.

Medical Word Elements

This section introduces combining forms, suffixes, and prefixes related to the integumentary system. Word analyses are also provided.

Element	Meaning	Word Analysis
Combining Forms		
adip/o	fat	adip /osis (ăd-ĭ-PŌ-sĭs): abnormal condition of fat -osis: abnormal condition; increase (used primarily with blood cells) <i>Adiposis is an abnormal accumulation of fatty tissue in the body.</i>
lip/o		lip /o/cele (LĪP-ō-sēl): hernia containing fat -cele: hernia, swelling
steat/o	skin	steat /itis (stē-ă-TĪ-tĭs): inflammation of fatty (adipose) tissue -itis: inflammation
cutane/o		sub/ cutane /ous (sŭb-kŭ-TĀ-nē-ŭs): pertaining to beneath the skin sub-: under, below -ous: pertaining to
dermat/o		dermat /o/plasty (DĚR-mă-tō-plă-s-tē): surgical repair of the skin -plasty: surgical repair
derm/o		hypo/ derm /ic (hĭ-pō-DĚR-mĭk): pertaining to under the skin hypo-: under, below -ic: pertaining to <i>A hypodermic injection is one in which the needle is inserted under the skin.</i>
hidr/o	sweat	hidr /aden/itis (hĭ-drăd-ě-NĪ-tĭs): inflammation of the sweat glands aden: gland -itis: inflammation <i>Do not confuse hidr/o (sweat) with hydr/o (water).</i>
sudor/o		sudor /esis (soo-dō-RĒ-sĭs): profuse sweating -esis: condition
ichthy/o	dry, scaly	ichthy /osis (ĭk-thē-Ō-sĭs): abnormal condition of dry or scaly skin -osis: abnormal condition; increase (used primarily with blood cells) <i>Ichthyosis can be any of several dermatological conditions in which the skin is dry and hardened (hyperkeratotic), resembling fish scales. A mild form of ichthyosis, called winter itch, is commonly seen on the legs of older patients, especially during the winter months.</i>
kerat/o	horny tissue; hard; cornea	kerat /osis (kĕr-ă-TŌ-sĭs): abnormal condition of horny tissue -osis: abnormal condition; increase (used primarily with blood cells) <i>Keratosis is a thickened area of the epidermis or any horny growth on the skin, such as a callus or wart.</i>
melan/o	black	melan /oma (mĕl-ă-NŌ-mă): black tumor -oma: tumor
myc/o	fungus (plural, fungi)	dermat/o/ myc /osis (dĕr-mă-tō-mĭ-KŌ-sĭs): fungal infection of the skin dermat/o: skin -osis: abnormal condition; increase (used primarily with blood cells) <i>Melanoma is a malignant tumor of melanocytes that commonly begins in a darkly pigmented mole and can metastasize widely.</i>

Medical Word Elements—cont'd		
Element	Meaning	Word Analysis
onych/o	nail	onych/o /malacia (ŏn-ĭ-kŏ-mă-LĀ-shĕ-ă): softening of the nails -malacia: softening
ungu/o		ungu/al (ŨNG-gwăł): pertaining to the nails -al: pertaining to
pil/o	hair	pil/o /nid/al (pĭ-lŏ-NĪ-dăl): pertaining to hair in a nest <i>nid</i> : nest -al: pertaining to <i>A pilonidal cyst commonly develops in the skin at the base of the spine. It develops as a growth of hair in a dermoid cyst.</i>
trich/o		trich/o /pathy (trĭk-ŎP-ă-thĕ): disease involving the hair -pathy: disease
scler/o	hardening; sclera (white of eye)	scler/o /derma (sklĕ-rŏ-DĚR-mă): hardening of the skin -derma: skin <i>Scleroderma is an autoimmune disorder that causes the skin and internal organs to become progressively hardened due to deposits of collagen. It may occur as a localized form or as a systemic disease.</i>
seb/o	sebum, sebaceous	seb/o /rrhea (sĕb-ŏ-REĕ-ă): discharge of sebum -rrhea: discharge, flow <i>Seborrhea is an excessive secretion of sebum from the sebaceous glands.</i>
squam/o	scale	squam/ous (SKWĀ-mŭs): pertaining to scales (or covered with scales) -ous: pertaining to
xen/o	foreign, strange	xen/o /graft (ZĔN-ŏ-grăft): skin transplantation from a foreign donor (usually a pig) for a human; also called <i>heterograft</i> . <i>Xenografts are used as a temporary graft to protect the patient against infection and fluid loss.</i> -graft: transplantation
xer/o	dry	xer/o /derma (zĕ-rŏ-DĚR-mă): dry skin -derma: skin <i>Xeroderma is a chronic skin condition characterized by dryness and roughness and is a mild form of ichthyosis.</i>
Suffixes		
-cyte	cell	lip/o/ cyte (LĪP-ŏ-sĭt): fat cell <i>lip/o</i> : fat
-derma	skin	py/o/ derma (pĭ-ŏ-DĚR-mă): pus in the skin <i>py/o</i> : pus <i>Pyoderma is an acute, inflammatory, purulent bacterial dermatitis. It may be primary, such as impetigo, or secondary to a previous skin condition.</i>
-logist	specialist in the study of	dermat/o/ logist (dĕr-mă-TŎL-ŏ-jĭst): specialist in treatment of skin disorders <i>dermat/o</i> : skin
-logy	study of	dermat/o/ logy (dĕr-mă-TŎL-ŏ-jĕ): study of the skin (and its diseases) <i>dermat/o</i> : skin

(continued)

Medical Word Elements—cont'd		
Element	Meaning	Word Analysis
-therapy	treatment	cry/o/ therapy (krī-ō-THĒR-ă-pē): use of cold in the treatment (of disease) cry/o: cold <i>Cryotherapy is used to destroy tissue by freezing with liquid nitrogen. Cutaneous warts and actinic keratosis are common skin disorders that respond well to cryotherapy treatment.</i>
Prefixes		
an-	without, not	an /hidr/osis (ăn-hĭ-DRŌ-sĭs): abnormal condition of absence of sweat hidr: sweat -osis: abnormal condition; increase (used primarily with blood cells)
dia-	through, across	dia /phoresis (dĭ-ă-fă-RĒ-sĭs): excessive or profuse sweating; also called <i>sudoresis</i> or <i>hyperhidrosis</i> -phoresis: carrying; transmission
epi-	above, upon	epi /derm/is (ĕp-ĭ-DĒR-mĭs): above the skin derm: skin -is: noun ending <i>Epidermis is the outermost layer of the skin.</i>
homo-	same	homo /graft (HŌ-mŏ-grăft): transplantation of tissue between individuals of the same species; also called <i>allograft</i> -graft: transplantation
hyper-	excessive, above normal	hyper /hidr/osis (hĭ-pĕr-hĭ-DRŌ-sĭs): excessive or profuse sweating; also called <i>diaphoresis</i> or <i>sudoresis</i> hidr: sweat -osis: abnormal condition; increase (used primarily with blood cells)
sub-	under, below	sub /ungu/al (sŭb-ŨNG-gwăł): pertaining to beneath the nail of a finger or toe ungu: nail -al: pertaining to



It is time to review medical word elements by completing Learning Activity 5–2. For audio pronunciations of the above-listed key terms, you can visit www.davisplus.fadavis.com/gyls/systems to download this chapter's Listen and Learn exercises or use the book's audio CD (if included).

Pathology

General appearance and condition of the skin are clinically important because they may provide clues to body conditions or dysfunctions. Pale skin may indicate shock; red, flushed, very warm skin may indicate fever and infection. A rash may indicate allergies or local infections. Even chewed fingernails may be a clue to emotional problems. For diagnosis, treatment, and management of skin disorders, the medical services of a specialist may be warranted. **Dermatology** is the medical specialty concerned with diseases that directly affect the skin and systemic diseases that manifest their effects on the skin. The

physician who specializes in diagnosis and treatment of skin diseases is known as a **dermatologist**.

Skin Lesions

Lesions are areas of tissue that have been pathologically altered by injury, wound, or infection. Lesions may affect tissue over an area of a definite size (**localized**) or may be widely spread throughout the body (**systemic**). Evaluation of skin lesions, injuries, or changes to tissue helps establish the diagnosis of skin disorders. Lesions are described as primary or secondary. **Primary skin lesions** are the initial reaction to **pathologically**

altered tissue and may be flat or elevated. **Secondary skin lesions** are changes that take place in the primary lesion due to infection, scratching, trauma, or various stages of a disease. Lesions are also described by their appearance, color, location, and size as measured in centimeters. Some of the major primary and secondary skin lesions are described and illustrated in Figure 5–3.

Burns

Burns are tissue injuries caused by contact with thermal, chemical, electrical, or radioactive agents. Although burns generally occur on the skin, they can also affect the respiratory and digestive tract linings. Burns that have a local effect are not as serious as those that have a systemic effect.

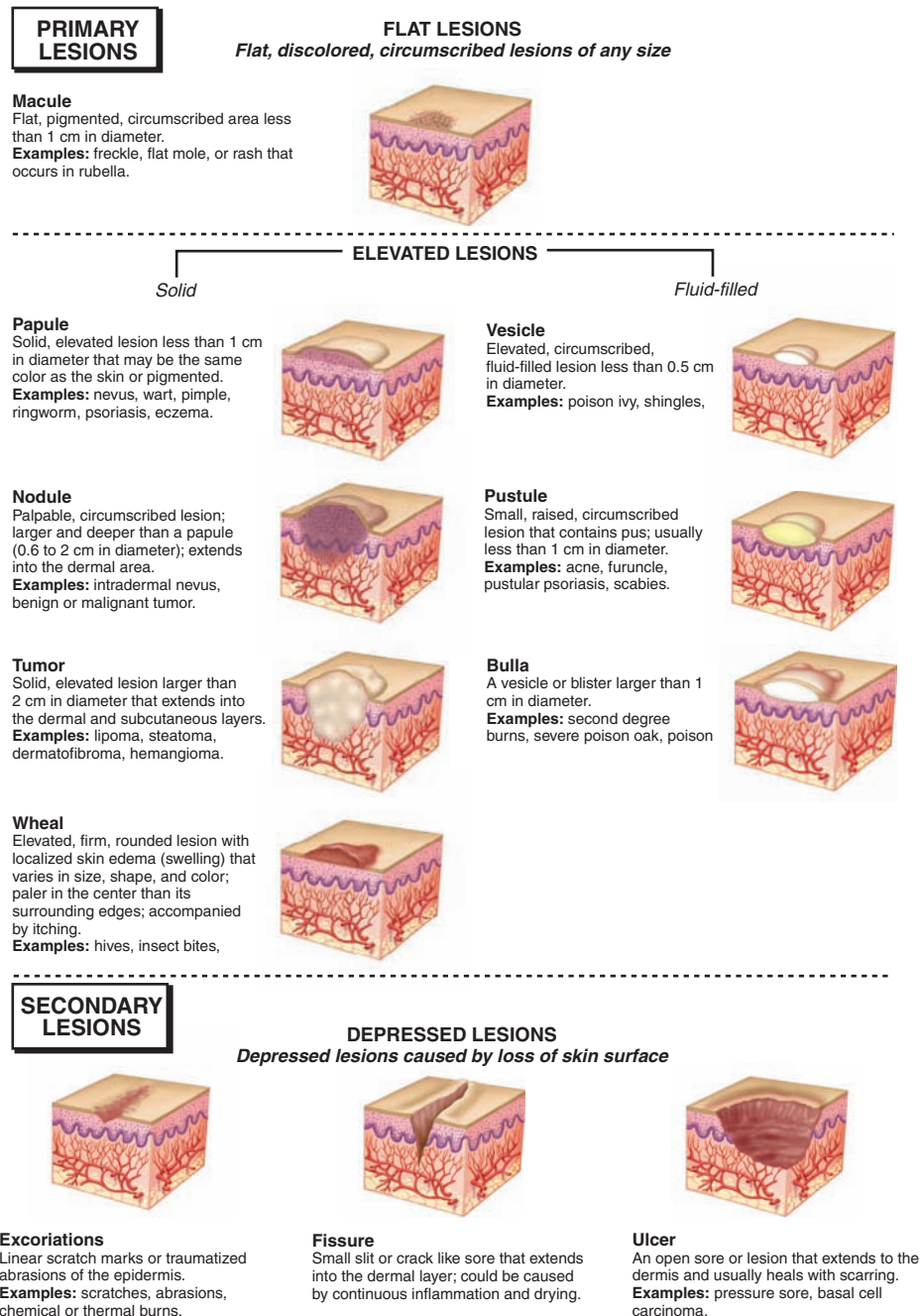


Figure 5-3. Primary and secondary lesions.



It is time to review skin lesions by completing Learning Activity 5–3.

Systemic effects are life threatening and may include dehydration, shock, and infection.

Burns are usually classified as first-, second-, or third-degree burns. The extent of injury and degree of severity determine a burn's classification.

First-degree (superficial) burns are the least serious type of burn because they injure only the top layers of the skin, the epidermis. These burns are most often caused by brief contact with either dry or moist heat (**thermal burn**), spending too much time in the sun (**sunburn**), or exposure to chemicals. Injury is restricted to local effects, such as skin redness (**erythema**) and acute sensitivity to sensory stimuli (**hyperesthesia**), such as touch, heat, or cold. Generally, blisters do not form and the burn heals without scar formation. **Second-degree (partial-thickness) burns** are deep burns that damage both the epidermis and part of the dermis. These burns may be caused by contact with flames, hot liquids, or chemicals. Symptoms mimic those of first-degree burns, but fluid-filled blisters (**vesicles** or **bullae**) form and the burn may heal with little or no scarring. See Figure 5-4.)

In **third-degree (full-thickness) burns**, the epidermis and dermis are destroyed and some of the underlying connective tissue is damaged, leaving the skin waxy and charred with insensitivity to touch. The underlying bones, muscles, and tendons may also be damaged. These burns may be caused by corrosive chemicals, flames, electricity, or extremely hot objects; immersion of the body in extremely hot water, or clothing that catches fire. Because of the extensiveness of tissue destruction,

ulcerating wounds develop and the body attempts to heal itself by forming scar tissue. Skin grafting (**dermatoplasty**) is commonly required to protect the underlying tissue and assist in recovery.

A formula for estimating the percentage of adult body surface area affected by burns is to apply the Rule of Nines. This method assigns values of 9% or 18% of surface areas to specific regions. The formula is modified in infants and children because of the proportionately larger head size. (See Figure 5-5.) To determine treatment, it is important to know the amount of the burned surface area because IV fluids for hydration are required to replace fluids lost from tissue damage.

Oncology

Neoplasms are abnormal growths of new tissue that are classified as benign or malignant. **Benign neoplasms** are noncancerous growths composed of the same type of cells as the tissue in which they are growing. They harm the individual only insofar as they place pressure on surrounding structures. If the benign neoplasm remains small and places no pressure on adjacent structures, it commonly is not removed. When it becomes excessively large, causes pain, or places pressure on other organs or structures, excision is necessary. **Malignant neoplasms** are composed of cells that are invasive and spread to remote regions of the body. These cells show altered function, altered appearance, and uncontrolled growth. They invade surrounding tissue and, ultimately, some of the malignant cells from the



Figure 5-4. Second-degree burn of the hand. From Goldsmith, Lazarus, & Tharp: *Adult and Pediatric Dermatology: A Color Guide to Diagnosis and Treatment*. FA Davis, Philadelphia, 1997, p 318, with permission.

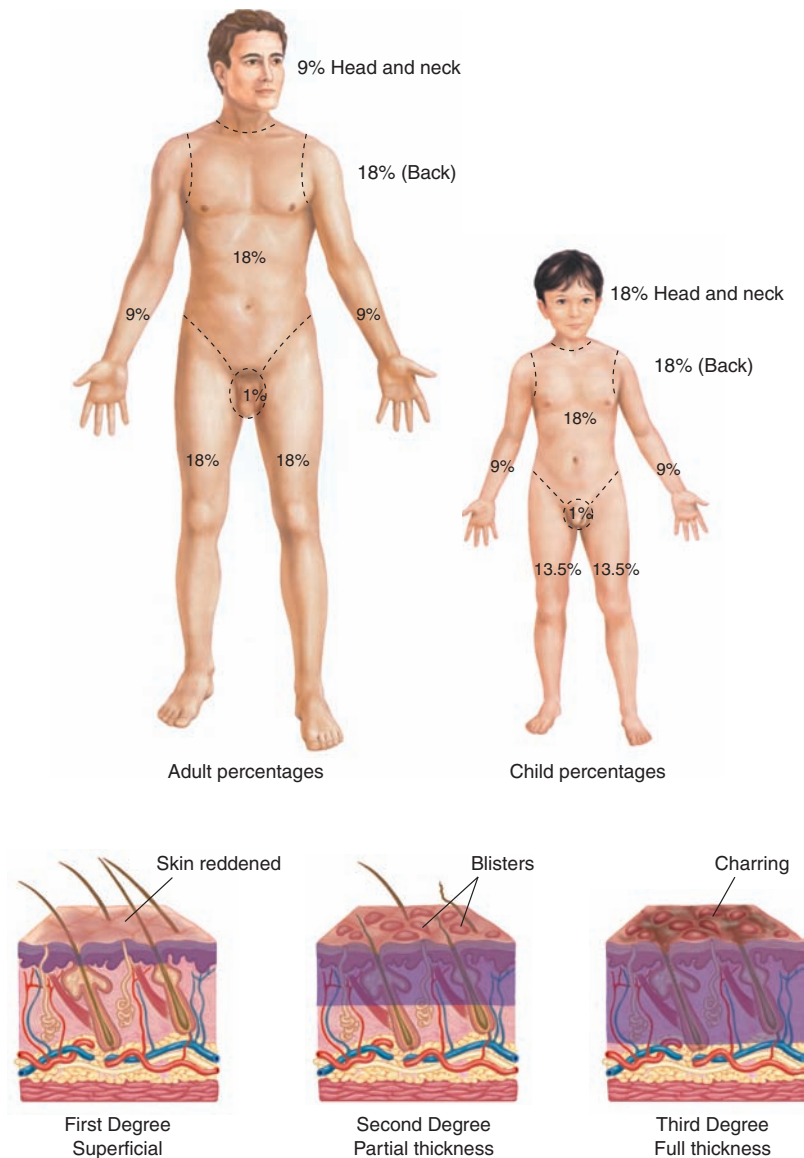


Figure 5-5. Rule of Nines and burn classification.

primary tumor may enter blood and lymph vessels and travel to remote regions of the body to form secondary tumor sites, a process called *metastasis*. The presence of a malignant growth (tumor), is the disease called *cancer*. The ability to invade surrounding tissues and spread to remote regions of the body is a distinguishing feature of cancer. If left untreated, cancer is usually progressive and generally fatal.

Cancer (CA) treatment includes surgery, chemotherapy, immunotherapy, and radiation therapy. **Immunotherapy**, also called *biotherapy*, is a recent treatment that stimulates the body's own immune defenses to fight tumor cells. To provide the most effective treatment, the physician may prescribe one of the above treatments or

use a combination of them (**combined modality treatment**).

Grading and Staging Systems

Pathologists grade and stage tumors for **diagnostic** and **therapeutic** purposes. A **tumor** grading system is used to evaluate the appearance and maturity of malignant cells in a tumor. Pathologists commonly describe tumors by four grades of severity based on the microscopic appearance of their cells. (See Table 5–1.) A patient with a grade I tumor has the best **prognosis**; one with grade IV tumor has the poorest prognosis.

The tumor, node, metastasis (TNM) system of staging is used to identify the invasiveness of the malignant tumor. It also helps the **oncologist**

Table 5-1 Tumor Grading

The table below defines the four tumor grades and their characteristics.

Grading	Tumor Characteristics
Grade I Tumor cells well differentiated	<ul style="list-style-type: none"> • Close resemblance to tissue of origin, thus, retaining some specialized functions
Grade II Tumor cells moderately differentiated	<ul style="list-style-type: none"> • Less resemblance to tissue of origin • More variation in size and shape of tumor cells • Increased mitoses
Grade III Tumor cells poorly to very poorly differentiated	<ul style="list-style-type: none"> • Only remotely resembles tissue of origin • Marked variation in shape and size of tumor cells • Greatly increased mitoses
Grade IV Tumor cells very poorly differentiated	<ul style="list-style-type: none"> • Little or no resemblance to tissue of origin • Extreme variation in size and shape of tumor cells

determine the most effective method of treatment. The TNM system stages tumors according to three basic criteria:

- **T**—size and invasiveness of the primary tumor
- **N**—nodal involvement
- **M**—spreading of the primary tumor to remote regions of the body (**metastasis**).

Numbers are used to indicate size or spread of the tumor. The higher the number, the greater the extent or spread of the malignancy. For example, T2 designates a small tumor; M0 designates no evidence of metastasis. (See Table 5–2.)

Basal Cell Carcinoma

Basal cell carcinoma, the most common type of skin cancer, is a malignancy of the basal layer of the epidermis, or hair follicles. This type of cancer is commonly caused by overexposure to sunlight. (See Figure 5–6.) These tumors are locally invasive but rarely metastasize. Basal cell carcinoma is most prevalent in blond, fair-skinned men and is the most common malignant tumor affecting white people. Although these tumors grow slowly, they commonly ulcerate as they increase in size and develop crusting that is firm to the touch. Metastases are uncommon with this type of cancer; however, the disease can invade the tissue sufficiently to destroy an ear, nose, or eyelid. Depending on the location, size, and depth of the lesion, treatment may include curettage and electrodesiccation, chemotherapy, surgical excision, irradiation, or chemosurgery.

Squamous Cell Carcinoma

Squamous cell carcinoma arises from skin that undergoes pathological hardening (**keratinizing**) of epidermal cells. It is an invasive tumor with potential for metastasis and occurs most commonly in fair-skinned white men over age 60. Repeated overexposure to the sun's ultraviolet rays greatly increases the risk of squamous cell carcinoma. Other predisposing factors associated with this type of cancer include radiation therapy, chronic skin irritation and inflammation, exposure to cancer causing agents (**carcinogens**), including tar and oil, hereditary diseases (such as **xeroderma pigmentosum** and **albinism**), and the presence of premalignant lesions (such as **actinic keratosis** or **Bowen disease**).

There are two types of squamous cell carcinoma: those that are confined to the original site (**in situ**) and those that penetrate the surrounding tissue (**invasive**). Treatment may consist of surgical excision; curettage and electrodesiccation, which provide good cosmetic results for smaller lesions; radiation therapy, usually for older or debilitated patients; and chemotherapy, depending on the location, size, shape, degree of invasion, and condition of underlying tissue. A combination of these treatment methods may be required for a deeply invasive tumor.

Malignant Melanoma

Malignant melanoma is a neoplasm composed of abnormal melanocytes that commonly begin in a darkly pigmented mole. Although malignant melanoma is relatively rare, the incidence is rising more rapidly than any other malignancy.

Table 5-2 **TNM System of Staging**

*The table below outlines the tumor, node, metastasis (TNM) system of staging, including designations, stages, and degrees of tissue involvement.**

Designation	Stage	Tissue involvement
Tumor		
T0		No evidence of tumor
Tis	Stage I	Carcinoma in situ indicates the tumor is in a defined location and shows no invasion into surrounding tissues
T1, T2, T3, T4	Stage II	Primary tumor size and extent of local invasion, where T1 is small with minimal invasion and T4 is large with extensive local invasion into surrounding organs and tissues
Node		
N0		Regional lymph nodes show no abnormalities
N1, N2, N3, N4	Stage III	Degree of lymph node involvement and spread to regional lymph nodes, where N1 is less involvement with minimal spreading and N4 is more involvement with extensive spreading
Metastasis		
M0		No evidence of metastasis
M1	Stage IV	Indicates metastasis

*The designations Tx, Nx, and Mx indicate that the tumor, node, or metastasis cannot be assessed clinically.

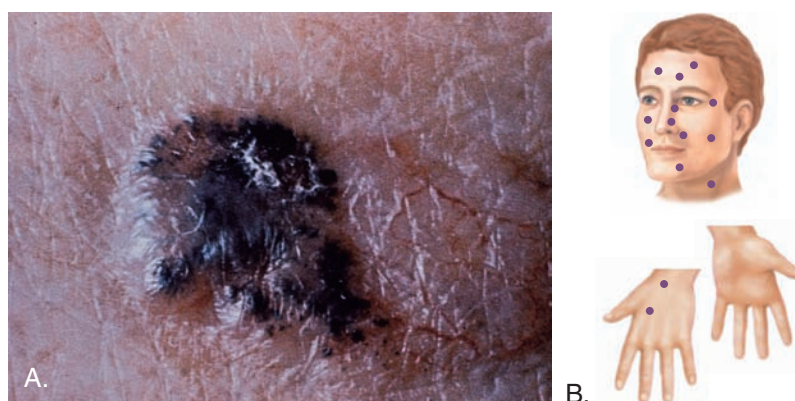


Figure 5-6. (A) Basal cell carcinoma (late stage). (B) common sites of basal cell carcinoma.

It is the most lethal of the skin cancers and can metastasize extensively to the liver, lungs, or brain.

Several factors may influence the development of melanoma, but persons at greatest risk have fair complexions, blue eyes, red or blonde hair, and freckles. Excessive exposure to sunlight and severe sunburn during childhood are believed to increase the risk of melanoma in later life. Avoiding the sun

and using sunscreen have proved effective in preventing the disease.

Melanomas are diagnosed by **biopsy** along with histological examination. Treatment requires surgery to remove the primary cancer, along with adjuvant therapies to reduce the risk of metastasis. The extent of surgery depends on the size and location of the primary tumor and is determined by staging the disease.



It is time to review burn and oncology terms by completing Learning Activity 5-4.

Diagnostic, Symptomatic, and Related Terms

This section introduces diagnostic, symptomatic, and related terms and their meanings. Word analyses for selected terms are also provided.


Term	Definition
abscess ÄB-sēs	<p>Localized collection of pus at the site of an infection (characteristically a <i>staphylococcal</i> infection)</p> <p><i>When a localized abscess originates in a hair follicle, it is called a furuncle, or boil. A cluster of furuncles in the subcutaneous tissue results in the formation of a carbuncle. (See Figure 5-7.)</i></p> 
acne ÄK-nē	<p>Inflammatory disease of the sebaceous glands and hair follicles of the skin with characteristic lesions that include blackheads (comedos), inflammatory papules, pustules, nodules, and cysts; usually associated with seborrhea; also called <i>acne vulgaris</i></p> <p><i>Acne results from thickening of the follicular opening, increased sebum production, and the presence of bacteria. It is associated with an inflammatory response. The face, neck, and shoulders are common sites for this condition.</i></p>
alopecia äĭ-ō-PĒ-shē-ä	<p>Partial or complete loss of hair resulting from normal aging, an endocrine disorder, a drug reaction, anticancer medication, or a skin disease; commonly called <i>baldness</i></p>
Bowen disease BŌ-ēn	<p>Form of intraepidermal carcinoma (squamous cell) characterized by red-brown scaly or crusted lesions that resemble a patch of psoriasis or dermatitis; also called <i>Bowen precancerous dermatosis</i></p> <p><i>Treatment for Bowen disease includes curettage and electrodesiccation.</i></p>
cellulitis sĕĭ-ŭ-LĪ-tīs	<p>Diffuse (widespread), acute infection of the skin and subcutaneous tissue</p> <p><i>Cellulitis is characterized by a light glossy appearance of the skin, localized heat, redness, pain, swelling, and, occasionally, fever, malaise, and chills.</i></p>
chloasma klō-ÄZ-mă	<p>Pigmentary skin discoloration usually occurring in yellowish brown patches or spots</p>
comedo KŌM-ē-dō	<p>Typical small skin lesion of acne vulgaris caused by accumulation of keratin, bacteria, and dried sebum plugging an excretory duct of the skin</p> <p><i>The closed form of comedo, called a whitehead, consists of a papule from which the contents are not easily expressed.</i></p>

Figure 5-7. Dome-shaped abscess that has formed a furuncle in hair follicles of the neck. Large furuncles with connecting channels to the skin surface form a carbuncle.

Diagnostic, Symptomatic, and Related Terms—cont'd



Term	Definition
dermatomycosis dĕr-mă-tō-mī-KŌ-sĭs <i>dermat/o:</i> skin <i>myc:</i> fungus <i>-osis:</i> abnormal condition; increase (used primarily with blood cells)	Infection of the skin caused by fungi <i>A common type of dermatomycosis is called ringworm.</i>
ecchymosis ĕk-ĭ-MŌ-sĭs	Skin discoloration consisting of a large, irregularly formed hemorrhagic area with colors changing from blue-black to greenish brown or yellow; commonly called a <i>bruise</i> (See Figure 5-8.)
	
Figure 5-8. Ecchymosis.	
eczema ĔK-zĕ-mă	Chronic skin inflammation characterized by erythema, papules, vesicles, pustules, scales, crusts, scabs, and, possibly, itching <i>Symptoms of eczema may occur alone or in combination.</i>
erythema ĕr-ĭ-TĤĒ-mă	Redness of the skin caused by swelling of the capillaries <i>An example of erythema is a mild sunburn or nervous blushing.</i>
eschar ĔS-kăr	Damaged tissue following a severe burn
impetigo ĭm-pĕ-TĪ-gŏ	Bacterial skin infection characterized by isolated pustules that become crusted and rupture
keratosis kĕr-ă-TŌ-sĭs <i>kerat:</i> horny tissue, hard; cornea <i>-osis:</i> abnormal condition; increase (used primarily with blood cells)	Thickened area of the epidermis or any horny growth on the skin (such as a callus or wart)
lentigo lĕn-TĪ-gŏ	Small brown macules, especially on the face and arms, brought on by sun exposure, usually in a middle-aged or older person <i>These pigmented lesions of the skin are benign and no treatment is necessary unless cosmetic repair is desired.</i>
pallor PĀL-or	Unnatural paleness or absence of color in the skin

(continued)

Diagnostic, Symptomatic, and Related Terms—cont'd

Term	Definition
<p>pediculosis pĕ-dĭk-ŭ-LŌ-sĭs <i>pedicul</i>: lice <i>-osis</i>: abnormal condition; increase (used primarily with blood cells)</p>	<p>Infestation with lice, transmitted by personal contact or common use of brushes, combs, or headgear</p>
<p>petechia pĕ-TĒ-kĕ-ă</p>	<p>Minute, pinpoint hemorrhage under the skin <i>A petechia is a smaller version of an ecchymosis.</i></p>
<p>pressure ulcer ŪL-sĕr</p>	<p>Skin ulceration caused by prolonged pressure from lying in one position that prevents blood flow to the tissues, usually in bedridden patients; also known as <i>decubitus ulcer</i> <i>Pressure ulcers are most commonly found in skin overlying a bony projection, such as the hip, ankle, heel, shoulder, and elbow.</i></p>
<p>pruritus proo-RĪ-tŭs</p>	<p>Intense itching</p>
<p>psoriasis sō-RĪ-ă-sĭs</p>	<p>Chronic skin disease characterized by circumscribed red patches covered by thick, dry, silvery, adherent scales caused by excessive development of the basal layer of the epidermis (See Figure 5-9.) <i>New psoriasis lesions tend to appear at sites of trauma. They may be found in any location but commonly on the scalp, knees, elbows, umbilicus, and genitalia. Treatment includes topical application of various medications, keratolytics, phototherapy, and ultraviolet light therapy in an attempt to slow hyperkeratosis.</i></p>
	
	<p>Figure 5-9. Psoriasis. From Goldsmith, Lazarus, & Tharp: <i>Adult and Pediatric Dermatology: A Color Guide to Diagnosis and Treatment</i>. FA Davis, Philadelphia, 1997, p 381, with permission.</p>
<p>purpura PŪR-pŭ-ră</p>	<p>Any of several bleeding disorders characterized by hemorrhage into the tissues, particularly beneath the skin or mucous membranes, producing ecchymoses or petechiae <i>Hemorrhage into the skin shows red darkening into purple and then brownish yellow and finally disappearing in 2 to 3 weeks. Areas of discoloration do not disappear under pressure.</i></p>


Diagnostic, Symptomatic, and Related Terms—cont'd

Term	Definition
scabies SKĀ-bēz	Contagious skin disease transmitted by the itch mite, commonly through sexual contact <i>Scabies manifests as papules, vesicles, pustules, and burrows and causes intense itching commonly resulting in secondary infections. The axillae, genitalia, inner aspect of the thighs, and areas between the fingers are most commonly affected.</i>
tinea TĪN-ē-āh	Fungal skin infection whose name commonly indicates the body part affected; also called <i>ringworm</i> <i>Examples include tinea barbae (beard), tinea corporis (body), tinea pedis (athlete's foot), tinea versicolor (skin), tinea cruris (jock itch).</i>
urticaria ūr-tī-KĀR-ē-ā	Allergic reaction of the skin characterized by the eruption of pale red, elevated patches called <i>wheals</i> or <i>hives</i> (See Figure 5-10)
	
	Figure 5-10. Urticaria. From Goldsmith, Lazarus, & Tharp: <i>Adult and Pediatric Dermatology: A Color Guide to Diagnosis and Treatment</i> . FA Davis, Philadelphia, 1997, p 381, with permission.
verruca vēr-ROO-kă	Epidermal growth caused by a virus; also known as warts. Types include plantar warts, juvenile warts, and venereal warts <i>Verrucae may be removed by cryosurgery, electrocautery, or acids; however, they may regrow if the virus remains in the skin.</i>
vitiligo vīt-īl-Ī-gō	Localized loss of skin pigmentation characterized by milk-white patches (See Figure 5-11.)
	
	Figure 5-11. Vitiligo. From Goldsmith, Lazarus, & Tharp: <i>Adult and Pediatric Dermatology: A Color Guide to Diagnosis and Treatment</i> . FA Davis, Philadelphia, 1997, p 121, with permission.

(continued)

Diagnostic and Therapeutic Procedures

This section introduces procedures used to diagnose and treat skin disorders. Descriptions are provided as well as pronunciations and word analyses for selected terms.

Procedure	Description
<i>Diagnostic Procedures</i>	
Clinical	
skin test (ST)	<p>Any test in which a suspected allergen or sensitizer is applied to or injected into the skin to determine the patient's sensitivity to it</p> <p><i>Most commonly used skin tests are the intradermal, patch, and scratch tests used for allergy testing. The intensity of the response is determined by the wheal-and-flare reaction after the suspected allergen is applied. Positive and negative controls are used to verify normal skin reactivity (See Figure 5-12.)</i></p>
	 <p>Figure 5-12. Skin tests. (A) Intradermal allergy test reactions. (B) Scratch (prick) skin test kit for allergy testing.</p>
intradermal in-tră-dēr-māl	<p>Skin test that identifies suspected allergens by subcutaneously injecting small amounts of extracts of the suspected allergens and observing the skin for a subsequent reaction</p> <p><i>Intradermal skin tests are used to determine immunity to diphtheria (Schick test) or tuberculosis (Mantoux test).</i></p>
patch	<p>Skin test that identifies suspected allergens by topical application of the substance to be tested (such as food, pollen, and animal fur), usually on the forearm, and observing for a subsequent reaction</p> <p><i>After the patch is removed, a lack of noticeable reaction indicates a negative result; skin reddening or swelling indicates a positive result.</i></p>
scratch (prick)	<p>Skin test that identifies suspected allergens by placing a small quantity of the suspected allergen on a lightly scratched area of the skin</p> <p><i>Redness or swelling at the scratch sites within 10 minutes indicates an allergy to the substance, or a positive test result. If no reaction occurs, the test result is negative.</i></p>

Diagnostic and Therapeutic Procedures—cont'd	
Procedure	Description
Surgical	
biopsy BĪ-ōp-sē	Representative tissue sample removed from a body site for microscopic examination <i>Skin biopsies are used to establish or confirm a diagnosis, estimate prognosis, or follow the course of disease. Any lesion suspected of malignancy is removed and sent to the pathology laboratory for evaluation.</i>
needle	Removal of a small tissue sample for examination using a hollow needle, usually attached to a syringe
punch	Removal of a small core of tissue using a hollow punch
shave	Removal of surgical blade is used to remove elevated lesions
frozen section (FS)	Ultrathin slice of tissue from a frozen specimen for immediate pathological examination <i>FS is commonly used for rapid diagnosis of malignancy after the patient has been anesthetized to determine treatment options.</i>
Therapeutic Procedures	
chemical peel	Chemical removal of the outer layers of skin to treat acne scarring and general keratoses; also called <i>chemabrasion</i> <i>Chemical peels are also commonly used for cosmetic purposes to remove fine wrinkles on the face.</i>
debridement dā-brēd-MŌN	Removal of necrotized tissue from a wound by surgical excision, enzymes, or chemical agents <i>Debridement is used to promote healing and prevent infection.</i>
dermabrasion DĒRM-ă-brā-zhūn	Rubbing (abrasion) using wire brushes or sandpaper to mechanically scrape away (abrade) the epidermis <i>This procedure is commonly used to remove acne scars, tattoos, and scar tissue.</i>
fulguration fūl-gū-RĀ-shūn	Tissue destruction by means of high-frequency electric current; also called <i>electrodesiccation</i>
Surgical	
cryosurgery krī-ō-SĒR-jēr-ē	Use of subfreezing temperature (commonly liquid nitrogen) to destroy or eliminate abnormal tissue, such as tumors, warts, and unwanted, cancerous, or infected tissue (continued)

Diagnostic and Therapeutic Procedures—cont'd

Procedure	Description
incision and drainage (I&D)	Process of cutting through a lesion such as an abscess and draining its contents
skin graft	Surgical procedure to transplant healthy tissue by applying it to an injured site <i>Human, animal, or artificial skin can be used to provide a temporary covering or permanent layer of skin over a wound or burn.</i>
allograft ÄL-ō-grăft	Transplantation of healthy tissue from one person to another person; also called <i>homograft</i> <i>In an allograft, the skin donor is usually a cadaver. This type of skin graft is temporary and is used to protect the patient against infection and fluid loss. The allograft is frozen and stored in a skin bank until needed.</i>
autograft AW-tō-grăft	Transplantation of healthy tissue from one site to another site in the same individual
synthetic sĭn-THĒT-ĭk	Transplantation of artificial skin produced from collagen fibers arranged in a lattice pattern <i>The recipient's body does not reject synthetic skin (produced artificially) and healing skin grows into it as the graft gradually disintegrates.</i>
xenograft ZĒN-ō-grăft	Transplantation (dermis only) from a foreign donor (usually a pig) and transferred to a human; also called <i>heterograft</i> <i>A xenograft is used as a temporary graft to protect the patient against infection and fluid loss.</i>

Pharmacology

Various medications are available to treat skin disorders. (See Table 5–3.) Because of their superficial nature and location, many skin disorders respond well to topical drug therapy. Such mild, localized skin disorders as contact dermatitis, acne, poison ivy, and diaper rash can be effectively treated with topical agents available as over-the-counter products.

Widespread or particularly severe dermatological disorders may require systemic treatment. For example, poison ivy with large areas of open, weeping lesions may be difficult to treat with topical medication and may require a prescription-strength drug. In such a case, an oral steroid or antihistamine might be prescribed to relieve inflammation and severe itching.

Table 5-3 Drugs Used to Treat Skin Disorders

This table lists common drug classifications used to treat skin disorders, their therapeutic actions, and selected generic and trade names.

Classification	Therapeutic Action	Generic and Trade Names
antifungals	Alter the cell wall of fungi or disrupt enzyme activity, resulting in cell death <i>Antifungals are used to treat ringworm (tinea corporis), athlete's foot (tinea pedis), and fungal infection of the nail (onychomycosis). When topical antifungals are not effective, oral or intravenous antifungal drugs may be necessary.</i>	nystatin NĪS-tă-tĭn Mycostatin, Nyston itraconazole ĭt-ră-KÖN-ă-zōl Sporanox

Table 5-3

Drugs Used to Treat Skin Disorders—cont'd

This table lists common drug classifications used to treat skin disorders, their therapeutic actions, and selected generic and trade names.

Classification	Therapeutic Action	Generic and Trade Names
antihistamines	Inhibit allergic reactions of inflammation, redness, and itching caused by the release of histamine <i>In a case of severe itching, antihistamines may be given orally. As a group, these drugs are also known as antipruritics (pruritus means itching).</i>	diphenhydramine dī-fĕn-HĪ-dră-mĕn Benadryl loratadine lor-ĀH-tă-dĕn Claritin
antiseptics	Topically applied agents that inhibit growth of bacteria, thus preventing infections in cuts, scratches, and surgical incisions	ethyl or isopropyl alcohol ĒTH-ĭl ĩ-sō-PRŌ-pĭl hydrogen peroxide HĪ-drō-jĕn pĕ-RŌK-sĭd
corticosteroids	Decrease inflammation and itching by suppressing the immune system's inflammatory response to tissue damage <i>Topical corticosteroids are used to treat contact dermatitis, poison ivy, insect bites, psoriasis, seborrhea, and eczema. Oral corticosteroids may be prescribed for systemic treatment of severe or widespread inflammation or itching.</i>	hydrocortisone* hĪ-drō-KOR-tĭ-sōn Certacort, Cortaid triamcinolone trĭ-ām-SĪN-ō-lōn Azmecort, Kenalog
keratolytics	Destroy and soften the outer layer of skin so that it is sloughed off or shed <i>Strong keratolytics remove warts and corns and aid in penetration of antifungal drugs. Milder keratolytics promote shedding of scales and crusts in eczema, psoriasis, seborrheic dermatitis, and other dry, scaly conditions. Weak keratolytics irritate inflamed skin, acting as a tonic to accelerate healing.</i>	tretinoin TRĒT-ĭ-noyn Retin-A, Vesanoid
parasiticides	Kill insect parasites, such as mites and lice <i>Parasiticides are used to treat scabies (mites) and pediculosis (lice). The drug is applied as a cream or lotion to the body and as a shampoo to treat the scalp.</i>	lindane LĪN-dān Kwell, Thion permethrin pĕr-MĒTH-rĭn Nix
protectives	Cover, cool, dry, or soothe inflamed skin <i>Protectives do not penetrate the skin or soften it. Rather, they allow the natural healing process to occur by forming a long-lasting film that protects the skin from air, water, and clothing.</i>	lotions Cetaphil moisturizing lotion ointments Vaseline
topical anesthetics	Block sensation of pain by numbing the skin layers and mucous membranes <i>These topical drugs are administered directly by means of sprays, creams, gargles, suppositories, and other preparations. They provide temporary symptomatic relief of minor burns, sunburns, rashes, and insect bites.</i>	lidocaine LĪ-dō-kān Xylocaine procaine PRŌ-kān Novocain

*The suffixes -sone, -olone, and -onide are common to generic corticosteroids.



It is time to review diagnostic, symptomatic, procedure, and pharmacology terms by completing Learning Activity 5–5.

Abbreviations

This section introduces integumentary-related abbreviations and their meanings.

Abbreviation	Meaning	Abbreviation	Meaning
Bx, bx	biopsy	ID	intra-dermal
BCC	basal cell carcinoma	I&D	incision and drainage
CA	cancer; chronological age; cardiac arrest	IMP	impression (synonymous with diagnosis)
cm	centimeter	IV	intravenous
decub	decubitus (ulcer)	subcu, Sub-Q, subQ	subcutaneous (injection)
derm	dermatology	ung	ointment
FS	frozen section	XP, XDP	xeroderma pigmentosum

LEARNING ACTIVITIES

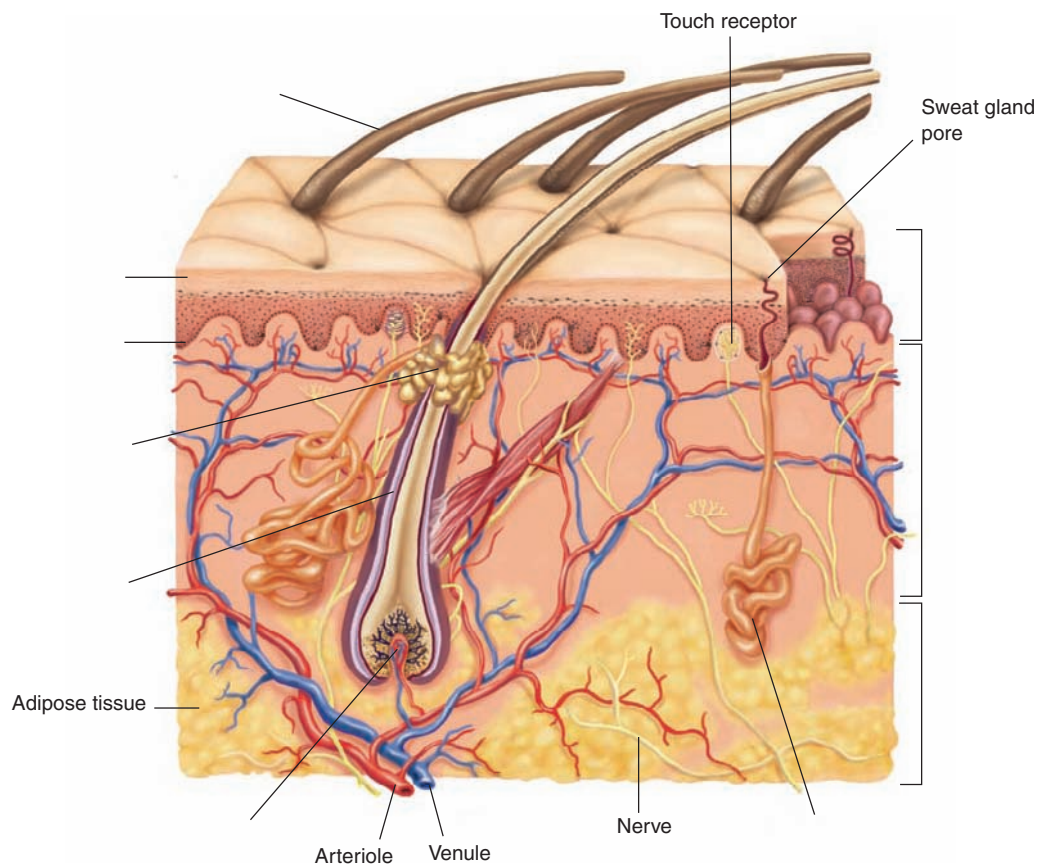
The following activities provide review of the integumentary system terms introduced in this chapter. Complete each activity and review your answers to evaluate your understanding of the chapter.

Learning Activity 5-1

Identifying Integumentary Structures

Label the following illustration using the terms listed below.

dermis papilla stratum germinativum
 epidermis sebaceous (oil) gland subcutaneous tissue
 hair follicle stratum corneum sudoriferous (sweat) gland
 hair shaft



Check your answers by referring to Figure 5-1 on page 73. Review material that you did not answer correctly.



Enhance your study and reinforcement of word elements with the power of DavisPlus. Visit www.davisplus.fadavis.com/gylys/systems for this chapter's flash-card activity. We recommend you complete the flash-card activity before completing Activity 5-2 below.

Learning Activity 5-2

Building Medical Words

Use *adip/o* or *lip/o* (fat) to build words that mean:

1. tumor consisting of fat _____
2. hernia containing fat _____
3. resembling fat _____
4. fat cell _____

Use *dermat/o* (skin) to build words that mean:

5. inflammation of the skin _____
6. instrument to incise the skin _____

Use *onych/o* (nail) to build words that mean:

7. tumor of the nails _____
8. softening of the nails _____
9. abnormal condition of the nails _____
10. abnormal condition of the nails caused by a fungus _____
11. abnormal condition of a hidden (ingrown) nail _____
12. disease of the nails _____

Use *trich/o* (hair) to build words that mean:

13. disease of the hair _____
14. abnormal condition of hair caused by a fungus _____

Use *-logy* or *-logist* to build words that mean:

15. study of the skin _____
16. specialist in skin (diseases) _____

Build surgical words that mean:

17. excision of fat (adipose tissue) _____
18. removal of a nail _____
19. incision of a nail _____
20. surgical repair (plastic surgery) of the skin _____



Check your answers in Appendix A. Review material that you did not answer correctly.

Correct Answers _____ × 5 = _____ % Score

Learning Activity 5-3

Identifying Skin Lesions

Label the following skin lesions on the lines provided, using the terms listed below.

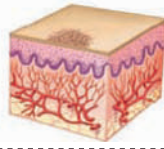
- | | | | |
|---------------------|---------------|----------------|----------------|
| <i>bulla</i> | <i>macule</i> | <i>pustule</i> | <i>vesicle</i> |
| <i>excoriations</i> | <i>nodule</i> | <i>tumor</i> | <i>wheel</i> |
| <i>fissure</i> | <i>papule</i> | <i>ulcer</i> | |

PRIMARY LESIONS

FLAT LESIONS

Flat, discolored, circumscribed lesions of any size

Flat, pigmented, circumscribed area less than 1 cm in diameter.
Examples: freckle, flat mole, or rash that occurs in rubella.



ELEVATED LESIONS

Solid

Solid, elevated lesion less than 1 cm in diameter that may be the same color as the skin or pigmented.
Examples: nevus, wart, pimple, ringworm, psoriasis, eczema.

Palpable, circumscribed lesion; larger and deeper than a papule (0.6 to 2 cm in diameter); extends into the dermal area.
Examples: intradermal nevus, benign or malignant tumor.

Solid, elevated lesion larger than 2 cm in diameter that extends into the dermal and subcutaneous layers.
Examples: lipoma, steatoma, dermatofibroma, hemangioma.

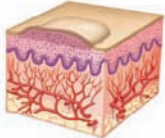
Elevated, firm, rounded lesion with localized skin edema (swelling) that varies in size, shape, and color; paler in the center than its surrounding edges; accompanied by itching.
Examples: hives, insect bites, urticaria.

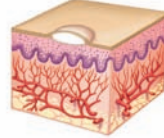
Fluid-filled

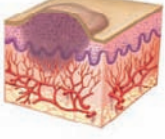
Elevated, circumscribed, fluid-filled lesion less than 0.5 cm in diameter.
Examples: poison ivy, shingles, chickenpox.

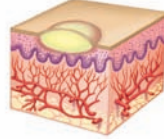
Small, raised, circumscribed lesion that contains pus; usually less than 1 cm in diameter.
Examples: acne, furuncle, pustular psoriasis, scabies.

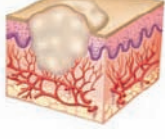
A vesicle or blister larger than 1 cm in diameter.
Examples: second-degree burns, severe poison oak, poison ivy.

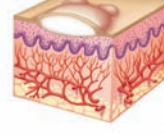


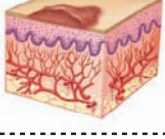








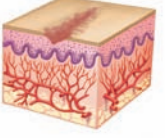


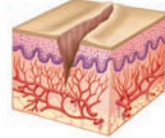


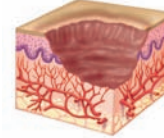
SECONDARY LESIONS

DEPRESSED LESIONS

Depressed lesions caused by loss of skin surface







Linear scratch marks or traumatized abrasions of the epidermis.
Examples: scratches, abrasions, chemical or thermal burns.

Small slit or crack-like sore that extends into the dermal layer; could be caused by continuous inflammation and drying.

An open sore or lesion that extends to the dermis and usually heals with scarring.
Examples: pressure sore, basal cell carcinoma.

Check your answers by referring to Figure 5-3 on page 79. Review material that you did not answer correctly.

Learning Activity 5-4

Matching Burn and Oncology Terms

Match each term on the left with its meaning on the right.

- | | |
|----------------------------------|--|
| 1. _____ erythema | a. develops from keratinizing epidermal cells |
| 2. _____ T0 | b. noncancerous |
| 3. _____ malignant | c. no evidence of metastasis |
| 4. _____ first-degree burn | d. extensive damage to underlying connective tissue |
| 5. _____ grading | f. determines degree of abnormal cancer cells compared with normal cells |
| 6. _____ squamous cell carcinoma | e. no evidence of primary tumor |
| 7. _____ benign | g. burn that heals without scar formation |
| 8. _____ T1 | h. cancerous; may be life-threatening |
| 9. _____ M0 | i. redness of skin |
| 10. _____ third-degree burns | j. primary tumor size, small with minimal invasion |



Check your answers in Appendix A. Review any material that you did not answer correctly.

Correct Answers _____ $\times 10 =$ _____ % Score

Learning Activity 5-5

Matching Diagnostic, Symptomatic, Procedure, and Pharmacology Terms

Match the following terms with the definitions in the numbered list.

<i>alopecia</i>	<i>dermabrasion</i>	<i>keratolytics</i>	<i>scabies</i>
<i>antifungals</i>	<i>ecchymosis</i>	<i>parasiticides</i>	<i>tinea</i>
<i>autograft</i>	<i>fulguration</i>	<i>patch test</i>	<i>urticaria</i>
<i>chloasma</i>	<i>impetigo</i>	<i>pediculosis</i>	<i>vitiligo</i>
<i>corticosteroids</i>	<i>intra-dermal test</i>	<i>petechiae</i>	<i>xenograft</i>

1. infestation with lice _____
2. skin depigmentation characterized by milk-white patches _____
3. fungal skin infection, also called ringworm _____
4. contagious skin disease transmitted by the itch mite _____
5. bacterial skin infection characterized by pustules that become crusted and rupture _____
6. allergic reaction of the skin characterized by elevated red patches called hives _____
7. hyperpigmentation of the skin, characterized by yellowish brown patches or spots _____
8. hemorrhagic spot or bruise on the skin _____
9. minute or small hemorrhagic spots on the skin _____
10. loss or absence of hair _____
11. topical agents to treat athlete's foot and onychomycosis _____
12. tissue destruction by means of high-frequency electric current _____
13. agents that decrease inflammation or itching _____
14. use of wire brushes or other abrasive materials to remove scars, tattoos, or fine wrinkles _____
15. agents that kill parasitic skin infestations _____
16. agents that soften the outer layer of skin so that it sloughs off _____
17. procedure in which extracts of suspected allergens are injected subcutaneously _____
18. procedure in which allergens are applied topically, usually on the forearm _____
19. skin graft taken from one site and applied to another site of the patient's body _____
20. skin graft taken from another species (usually a pig) to a human _____



Check your answers in Appendix A. Review material that you did not answer correctly.

Correct Answers _____ $\times 5 =$ _____ % Score

MEDICAL RECORD ACTIVITIES

The two medical records included in the following activities use common clinical scenarios to show how medical terminology is used to document patient care. Complete the terminology and analysis sections for each activity to help you recognize and understand terms related to the integumentary system.

Medical Record Activity 5-1

Pathology report: Skin lesion

Terminology

Terms listed in the following table are taken from *Pathology report: Skin lesion* that follows. Use a medical dictionary such as *Taber's Cyclopedic Medical Dictionary*, the appendices of this book, or other resources to define each term. Then review the pronunciations for each term and practice by reading the medical record aloud.

Term	Definition
atypia ā-TĪP-ē-ă	
atypical ā-TĪP-ī-kāl	
basal cell layer BĀ-sāl	
Bowen disease BŌ-ēn	
carcinoma kār-sī-NŌ-mă	
dermatitis dēr-mă-TĪ-tīs	
dermis DĚR-mīs	
dorsum DOR-sŭm	
epidermal hyperplasia ēp-ī-DĚR-māl hī- pēr-PLĀ-zē-ă	
fibroplasia fī-brō-PLĀ-sē-ă	
hyperkeratosis hī-pēr-kēr-ă-TŌ-sīs	
infiltrate ĪN-fil-trāt	

Term	Definition
keratinocytes kĕ-RĀT-ĭ-nō-sĭts	
lymphocytic lĭm-fō-SĪT-ĭk	
neoplastic nĕ-ō-PLĀS-tĭk	
papillary PĀP-ĭ-lār-ĕ	
pathological pāth-ō-LŌJ-ĭk-ăl	
solar elastosis SŌ-lār ĕ-lās-TŌ-sĭs	
squamous SKWĀ-mŭs	



Listen and Learn Online! *will help you master the pronunciation of selected medical words from this medical record activity. Visit www.davisplus.com/gyls/systems to find instructions on completing the Listen and Learn Online! exercise for this section and to practice pronunciations.*

PATHOLOGY REPORT: SKIN LESION

General Hospital

1511 Ninth Avenue ■■ Sun City, USA 12345 ■■ (555) 802-1887

PATHOLOGY REPORT

Date: April 14, 20xx
Patient: Franks, Robert
Physician: Dante Riox, MD

Pathology: 43022
Room: 910

Specimen: Skin from (a) dorsum left wrist and (b) left forearm, ulnar, near elbow.

Clinical Diagnosis: Bowen disease versus basal cell carcinoma versus dermatitis.

Microscopic Description: (a) There is mild hyperkeratosis and moderate epidermal hyperplasia with full-thickness atypia of squamous keratinocytes. Squamatization of the basal cell layer exists. A lymphocytic inflammatory infiltrate is present in the papillary dermis. Solar elastosis is present. (b) Nests, strands, and columns of atypical neoplastic basaloid keratinocytes grow down from the epidermis into the underlying dermis. Fibroplasia is present. Solar elastosis is noted.

Pathological Diagnosis: (a) Bowen disease of left wrist; (b) nodular and infiltrating basal cell carcinoma of left forearm, near elbow.

Samantha Roberts, MD
Samantha Roberts, MD

sr:bg

D: 4-16-xx
T: 4-16-xx

Analysis

Review the medical record *Pathology report: Skin lesion* to answer the following questions.

1. In the specimen section, what does “skin on dorsum left wrist” mean?

2. What was the inflammatory infiltrate?

3. What was the pathologist’s diagnosis for the left forearm?

4. Provide a brief description of Bowen disease, the pathologist’s diagnosis for the left wrist.

Medical Record Activity 5-2

Patient referral letter: Onychomycosis

Terminology

Terms listed in the following table are taken from the *Patient referral letter: Onychomycosis* that follows. Use a medical dictionary such as *Taber’s Cyclopedic Medical Dictionary*, the appendices of this book, or other resources to define each term. Then review the pronunciations for each term and practice by reading the medical record aloud.

Term	Definition
alkaline phosphatase ĀL-kā-līn FÖS-fā-tās	
bilaterally bī-LĀT-ēr-āl-ē	
CA	
debridement dā-brēd-MÖN	
hypertension hī-pēr-TĒN-shūn	
mastectomy mās-TĒK-tō-mē	
neurological noor-ō-LÖJ-īk-āl	
onychomycosis ōn-ī-kō-mī-KÖ-sīs	

Term	Definition
Sporanox* SPÖR-ă-nöks	
vascular VĀS-kū-lār	

*Refer to Table 5-3 to determine the drug classification and the generic name for *Sporanox*.



Listen and Learn Online! *will help you master the pronunciation of selected medical words from this medical record activity. Visit www.davisplus.com/gyls/systems to find instructions on completing the Listen and Learn Online! exercise for this section and to practice pronunciations.*

PATIENT REFERRAL LETTER: ONYCHOMYCOSIS

Physician Center

2422 Rodeo Drive ■■ Sun City, USA 12345 ■■ (555)788-2427

May 3, 20xx

John Roberts, MD
1115 Forest Ave
Sun City, USA 12345

Dear Doctor Roberts:

Thank you for referring Alicia Gonzoles to my office. Mrs. Gonzoles presents to the office for evaluation and treatment of onychomycosis with no previous treatment. Past pertinent medical history does reveal hypertension and breast CA. Pertinent surgical history does reveal mastectomy.

Examination of patient's feet does reveal onychomycosis, 1–5 bilaterally. Vascular and neurological examinations are intact. Previous laboratory work was within normal limits except for an elevated alkaline phosphatase of 100.

Tentative diagnosis: Onychomycosis, 1–5 bilaterally

Treatment consisted of debridement of mycotic nails, bilateral feet, as well as dispensing a prescription for Sporanox Pulse Pack to be taken for 3 months to treat the onychomycotic infection. I have also asked her to repeat her liver enzymes in approximately 4 weeks. Mrs. Gonzoles will make an appointment in 2 months for follow up, and I will keep you informed of any changes in her progress. If you have any questions, please feel free to contact me.

Sincerely yours,

Juan Perez, MD
Juan Perez, MD

jp:az

Analysis

Review the medical record *Patient referral letter: Onychomycosis* to answer the following questions.

1. What pertinent disorders were identified in the past medical history?

2. What pertinent surgery was identified in the past surgical history?

3. Did the doctor identify any problems in the vascular system or nervous system?

4. What was the significant finding in the laboratory results?

5. What treatment did the doctor employ for the onychomycosis?

6. What did the doctor recommend regarding the abnormal laboratory finding?
