

# INTEGUMENTARY SYSTEM

# 4

## Chapter Outline

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- Pressure, Pain, and Temperature
- Perception
- Hair and Nails

### Structure and Function Practice Exercises

### Combining Forms and Abbreviations

- Combining Forms
- Abbreviations

### Combining Forms and Abbreviations

### Practice Exercises

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- Pathology Terms
- Common Diagnostic Tests and Procedures
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### Pathologies, Procedures, and Pharmacology

### Practice Exercises

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## Structure and Function

You may not think of the skin as an organ, but it is actually the largest organ of the body. Let's take a look at the structure and function of the integumentary system.

The skin consists of three layers (Fig. 4-1). The **epidermis** is the thin outer layer that is constructed mostly of nonliving, keratinized (hardened) cells. It is waterproof and provides protection for the deeper layers. The epidermis is thickest on the palms of the hands and the soles of the feet. The base of this layer, aptly named the **basement membrane**, is where new, living epidermal cells are produced. These cells are pushed upward as even newer cells form beneath them. Eventually, they rise to the top, away from blood vessels and nerve endings, and die, thus becoming keratinized tissue. This is why cells on the top layer of your skin can be scraped away without causing pain.

### Flashpoint

The prefix *epi-* means *above* or *upon*; so the name *epi-dermis*, which means *above or upon the dermis*, tells you exactly where it is located.



### Learning Style Tip

Look carefully at the illustrations and photos in this book. Draw and label what you see.

The **dermis** lies just beneath the epidermis and is much thicker. It is made of fibrous connective tissue containing elastin, which provides elasticity, and collagen, which provides strength. It also contains a good blood supply and numerous other structures, including hair follicles, nerves, sweat glands, oil glands, and sensory receptors.

Beneath the dermis is the **subcutaneous layer**. This layer contains fat tissue as well as deeper blood vessels, nerves, the lower part of hair follicles, elastin, and collagen. The subcutaneous layer provides insulation for deeper structures.

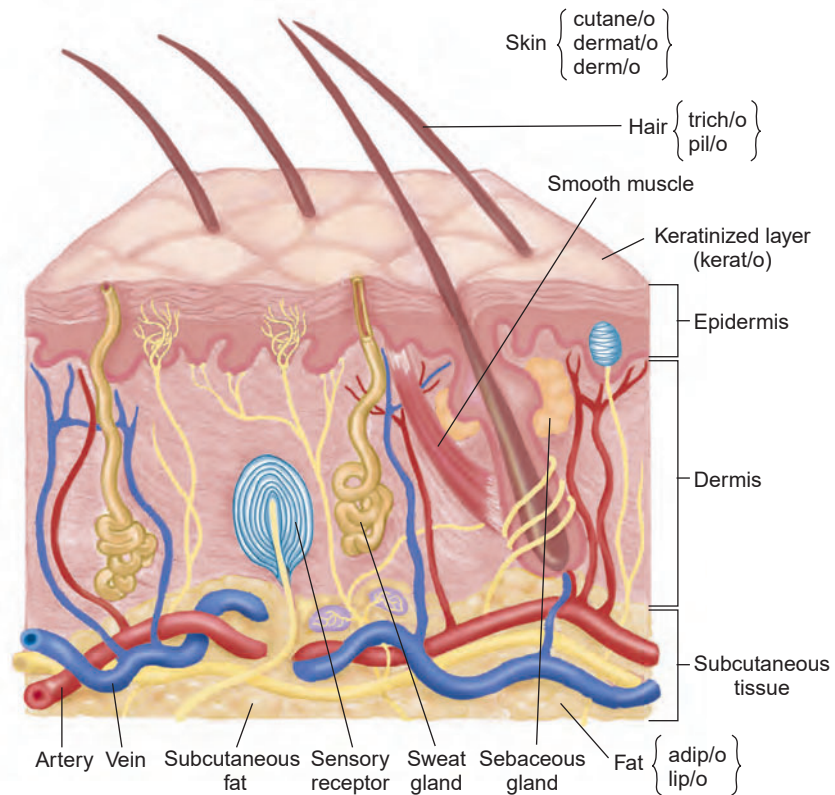


FIGURE 4-1 The skin.

Accessory structures of the skin include the **sudoriferous (sweat) glands**, **sebaceous (oil) glands**, hair, and nails. Sudoriferous glands are located throughout the body but are more concentrated in some areas, such as the soles of the feet and palms of the hands. Sebaceous glands are found at the base of hair follicles all over the body; they secrete an oily substance called **sebum**.



### Learning Style Tip

It can be helpful to *speak* and *hear* the information you are learning multiple times. Find a study partner or join a study group whenever possible. Take turns “teaching” each other the information by saying it aloud. Listeners should pay close attention and be prepared to discuss information they feel is incorrect or incomplete.

The **skin** (and its accessory structures) serve several important functions in the body. Its major functions are protection and temperature regulation. The skin protects your body from bacteria and other microorganisms, harmful ultraviolet light from the rays of the sun, and extreme temperatures. Because the outer layer of your skin is waterproof, it keeps pathogens (tiny disease-causing organisms) from entering even when it gets wet, unless there is a break in the skin. Sebum discourages bacterial growth; it also lubricates your skin to keep it soft and supple. If pathogens do get in through a **laceration** (a cut or tear in the flesh) or an **abrasion** (an area where skin or mucous membranes are scraped away), infection may occur. However, as the tissue becomes irritated, a natural inflammatory response occurs. When this happens, the body increases circulation of blood to the injured area. This is responsible for the **edema**

(swelling) and **erythema** (redness) that appear. Increased numbers of **leukocytes** (white blood cells) arrive to fight off the invaders and, quite literally, gobble them up. The increased circulation also helps speed the process of healing, as debris is cleared away and healthy new cells fill in the injured area, along with scar tissue.

The skin also contains **melanocytes**, which are pigment-producing skin cells. The pigment they produce, **melanin**, gives skin its colors. In response to ultraviolet light from the sun, melanocytes produce more melanin, causing a suntan. Melanin helps filter ultraviolet light and protect the skin from damage. The amount of melanin in your skin varies depending on your heredity and ethnicity.

### Flashpoint

A suntan is the body's way of protecting the skin from damage caused by ultraviolet light.

## Pressure, Pain, and Temperature Perception

Because the skin contains a number of different specialized nerves and sensory receptors, it plays a vital role in our ability to perceive pressure as well as pain and temperature. Messages from the receptors allow us to sense when we are being touched and recognize objects we are touching. They signal us to take measures to increase physical comfort, such as rolling over in bed or shifting in our chair to relieve excessive pressure (Box 4-1). We are able to manage our pain by receiving a massage or by applying an ice pack (IP) or moist hot pack (MHP) to the skin. In addition, sensory receptors also provide an important protective function: If you accidentally touch a very hot surface, your heat and pain receptors immediately send a message to your central nervous system, and you respond by pulling your hand away. Such a response is a protective **reflex**, which happens so quickly that you don't have time to think about it.

### Box 4-1 Pressure Ulcers

When soft tissue is compressed between a bony prominence and an external surface for a prolonged period of time, a pressure ulcer can develop. Pressure ulcers are integumentary system wounds that are also known as decubitus ulcers and bedsores. They can range in severity from a stage I ulceration with intact skin, to a stage IV ulcer in which muscle, tendon, or bone is visible in the wound. They can appear on various areas of the body, but it is common for them to be found on the back of the heel or on the sacrum. This is especially true when an individual has a decreased level of consciousness or is too weak to move themselves into a different position. Other risk factors for the development of pressure ulcers include inactivity, poor nutrition, incontinence, and impaired sensation. Individuals with prosthetic limbs are also prone to pressure ulcers as weight fluctuations can interfere with proper fit of the limb.

Techniques to prevent pressure ulcers, or to facilitate healing of existing ulcerations, include utilizing turning and repositioning schedules and using pressure relief devices such as cushions, wedges, or mattress overlays. A small rolled up towel under the ankle is a great way to keep the heel off of the bed. Forces such as shear and friction should also be minimized. The head of the bed should not be raised to a point that the person slides downward, and body parts should not be dragged across surfaces. In addition, excessive moisture should be eliminated by keeping clothing dry and using skin sealants or moisture barriers.

The integumentary system also plays an important role in body-temperature regulation. It provides insulation to keep you warm when the external environment is too cold. As your environment becomes colder, your hands and fingers become pale in color, because the blood vessels near your skin's surface constrict in order to give off less heat and thus conserve it for deeper organs. The opposite also occurs: When your environment is too hot, these same blood vessels dilate (expand) in order to give off more heat. This response may cause you to have a flushed appearance. In addition, your sweat glands secrete moisture, which evaporates on your skin's surface and provides even more cooling.

## Hair and Nails

Hair and nails are also accessory structures of the integumentary system. Hair is found on most parts of the body and is especially prominent on the head, in the nose and ears, and on the face as eyebrows and eyelashes. It serves a protective function, as it filters out dust and debris from the air. The part of the hair that you can see is the **hair shaft**. The part buried in the skin is the **hair follicle**, which contains the root. Hair is made up of a protein called keratin; it gets its color from melanin. With aging, the amount of melanin may decrease, leading to graying of hair. As new cells are formed in the hair root, older keratinized cells are pushed up and become part of the hair shaft.

Nails help to protect the ends of our fingers and toes. The nail forms in the nail root and is made up of keratinized squamous epithelial cells. As nails grow in a flattened shape, they slide very slowly over a layer of epithelial tissue called the **nailbed**. The area at the base of the nail, sometimes called the half-moon, is the **lunula**. This is where new growth occurs. Figure 4-2 shows the structure of the nail.

### Flashpoint

Sensory receptors in the skin help us to interact with our environment and protect us from harm.

### Learning Style Tip

Be sure to recite the new combining forms aloud so you benefit from saying and hearing them. Have fun being overly dramatic with your expressions, pronunciation, and body movements as you say the terms. You may feel silly doing this, but you will remember the terms better later on.

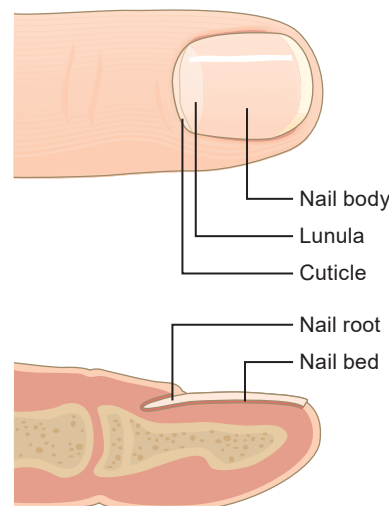


FIGURE 4-2 Nail structure.

## Structure and Function Practice Exercises

### Fill in the Blanks

Choose the term that matches the description.

#### Exercise 1

Epidermis	Skin	Melanin
Basement membrane	Laceration	Reflex
Dermis	Abrasion	Hair shaft
Subcutaneous layer	Edema	Hair follicle
Sudoriferous glands	Erythema	Nailbed
Sebaceous glands	Leukocytes	Lunula
Sebum	Melanocytes	

- \_\_\_\_\_ Area where skin has been scraped away
- \_\_\_\_\_ Sweat glands
- \_\_\_\_\_ Largest organ of the body with major functions of protection and temperature regulation
- \_\_\_\_\_ White blood cells
- \_\_\_\_\_ Pigment that gives skin its color
- \_\_\_\_\_ Part of the hair that you can see which functions to filter dust and debris from the air
- \_\_\_\_\_ Layer of skin that contains hair follicles, nerves, sweat glands, and sensory receptors
- \_\_\_\_\_ Redness
- \_\_\_\_\_ Action, or response, that happens so quickly that you don't have time to think about it
- \_\_\_\_\_ Layer of skin that contains fat and provides insulation for deeper structures
- \_\_\_\_\_ Nails slide slowly over this layer of epithelial tissue as they grow
- \_\_\_\_\_ Place where new, living epidermal cells are produced
- \_\_\_\_\_ Half-moon area at the base of the nail where new growth occurs



## Combining Forms and Abbreviations

### Combining Forms

Table 4-1 lists combining forms that pertain to the integumentary system. Table 4-2 lists combining forms related to color.

**TABLE 4-1**

#### COMBINING FORMS RELATED TO THE INTEGUMENTARY SYSTEM

Combining Form	Meaning	Example (Pronunciation)	Meaning of New Term
adip/o	fat	adipoid (Ā-dī-poyd)	resembling fat
lip/o		lipoma (lī-PŌ-mă)	tumor of fat
cutane/o	skin	cutaneous (kū-TĀ-nē-ŭs)	pertaining to the skin
derm/o		dermoplasty (DĚR-mō-plās-tē)	surgical repair of the skin
dermat/o		dermatologist (děr-mă-TŌ-lŏ-jĭst)	specialist in the study of the skin
cyt/o	cell	cytology (sĭ-TŌ-lŏ-jĕ)	study of cells
eti/o	cause	etiology (ĕ-tē-Ō-lŏ-jĕ)	study of causes
hidr/o	sweat	hidrosis (hĭ-DRŌ-sĭs)	abnormal condition of sweat
hydr/o	water	hydrotherapy (hĭ-drŏ-THĚR-ă-pĕ)	water therapy
idi/o	unknown, peculiar	idiopathic (ĭd-ĕ-ŏ-PĀTH-ĭk)	pertaining to an unknown disease
kerat/o	keratinized tissue, cornea	keratotomy (kĕr-ă-TŌ-tŏ-mĕ)	cutting into or incision of the cornea
morph/o	shape	morphology (mŏr-FŌ-lŏ-jĕ)	study of shapes
myc/o	fungus	mycosis (mĭ-KŌ-sĭs)	abnormal condition of fungus
necr/o	dead	necrosis (nĕ-KRŌ-sĭs)	abnormal condition of dead (tissue)
onych/o	nail	onychomalacia (ŏn-ĭ-kŏ-mă-LĀ-sĕ-ă)	softening of the nail
path/o	disease	pathologist (pă-THŌ-lŏ-jĭst)	specialist in the study of disease
pil/o	hair	depilous (DĚP-ĭl-ŭs)	absence of hair
trich/o		trichopathy (trĭk-ŌP-ă-thĕ)	disease of the hair
rhytid/o	wrinkle	rhytidectomy (rĭt-ĭ-DĚK-tŏ-mĕ)	surgical removal of wrinkles
scler/o	hardening, sclera	sclerosis (sklĕ-RŌ-sĭs)	abnormal condition of hardening
seb/o	sebum	seborrhea (sĕ-bŏ-RĚ-ă)	flow or discharge of sebum
son/o	sound	sonogram (SŌ-nŏ-grăġm)	record of sound
xer/o	dry	xeroderma (zĕr-ŏ-DĚR-mă)	dry skin

**TABLE 4-2**  
**COMBINING FORMS RELATED TO COLOR**

Combining Form	Meaning	Example	Meaning of New Term
albin/o	white	albinism (ĂL-bĭ-nĭ-zum)	condition of whiteness
leuk/o		leukorrhea (loo-kō-RĒ-ă)	white flow or discharge
chromat/o	color	chromatic (krō-MĂ-tĭk)	pertaining to color
cirrh/o	yellow	cirrhosis (sĭ-RŌ-sĭs)	abnormal condition of yellowness
xanth/o		xanthoderma (zăn-thō-DĚR-mă)	yellow skin
cyan/o	blue	cyanosis (sĭ-ă-NŌ-sĭs)	abnormal condition of blueness
erythem/o	red	erythematous (ĕ-ĭ-THĚM-ăt-us)	pertaining to redness
erythr/o		erythrocyte (ĕ-RĪTH-rō-sĭt)	red (blood) cell
melan/o	black	melanoma (mĕ-lă-NŌ-mă)	black tumor

### Learning Style Tip

Use colored markers or pens to highlight or underline terms with their associated colors (e.g., highlight *cyan/o* in blue) and draw silly pictures to associate with other terms (e.g., draw a wrinkly face next to *rhytid/o*).

### IN A FLASH!

Remove the Combining Form Flash Cards for Chapter 4 from the back of this book and run through them at least three times before you continue.

## Abbreviations

### Flashpoint

Using abbreviations can save you time and lengthy documentation; but, to avoid miscommunication, it is important to use only accurate, facility-approved abbreviations.

Abbreviations are used extensively in the world of health care. The primary reason is to save time in both written and verbal communications. As you will see, some medical terms are quite lengthy and difficult to pronounce. This is yet another reason for the use of abbreviations. Imagine having to say *endoscopic retrograde cholangiopancreatography* more than once in a conversation!

Table 4-3 lists some of the most common abbreviations pertaining to the integumentary system, as well as some that are commonly used for documentation or medication orders.

### IN A FLASH!

Go to the *DavisPlus* website to print out the Abbreviation Flash Cards for Chapter 4 and run through them at least three times before you continue.

TABLE 4-3

## ABBREVIATIONS

BCC	basal cell carcinoma	IV	intravenous
Bx, bx	biopsy	MM	malignant melanoma
C&S	culture and sensitivity	OTC	over-the-counter
decub	decubitus ulcer; also called <i>pressure ulcer</i>	PE	physical examination
derm	dermatology	SCC	squamous cell carcinoma
FH	family history	STM	soft tissue mobilization; also called <i>massage</i>
Hx	history	SubQ, Sub-Q	subcutaneous
I&D	incision and drainage	Sx	symptom(s)
ID	intra dermal (injection)	Tx	treatment
IP	ice pack	ung	ointment
MHP	moist hot pack		

## Combining Forms and Abbreviations Practice Exercises

### Fill in the Blanks

Fill in the blanks below using Tables 4-1 and 4-2.

#### Exercise 3

- condition of whiteness \_\_\_\_\_
- surgical removal of wrinkles \_\_\_\_\_
- yellow skin \_\_\_\_\_
- black tumor \_\_\_\_\_
- abnormal condition of blueness \_\_\_\_\_
- study of causes \_\_\_\_\_
- white flow or discharge \_\_\_\_\_

8. pertaining to redness \_\_\_\_\_
9. red (blood) cell \_\_\_\_\_
10. study of shapes \_\_\_\_\_
11. specialist in the study of disease \_\_\_\_\_
12. pertaining to color \_\_\_\_\_
13. dry skin \_\_\_\_\_
14. flow of sebum \_\_\_\_\_
15. resembling fat \_\_\_\_\_
16. abnormal condition of hardening \_\_\_\_\_
17. tumor of fat \_\_\_\_\_
18. absence of hair \_\_\_\_\_
19. water therapy \_\_\_\_\_
20. disease of the hair \_\_\_\_\_
21. pertaining to the skin \_\_\_\_\_
22. specialist in the study of the skin \_\_\_\_\_
23. study of cells \_\_\_\_\_
24. incision into the cornea \_\_\_\_\_
25. surgical repair of the skin \_\_\_\_\_
26. abnormal condition of fungus \_\_\_\_\_
27. abnormal condition of dead (tissue) \_\_\_\_\_
28. softening of the nail \_\_\_\_\_
29. abnormal condition of yellowness \_\_\_\_\_
30. abnormal condition of sweat \_\_\_\_\_
31. record of sound \_\_\_\_\_
32. pertaining to an unknown disease \_\_\_\_\_

## Fill in the Blanks

Write the correct term next to each abbreviation using Table 4-3.

### Exercise 4

1. STM \_\_\_\_\_
2. IV \_\_\_\_\_
3. ung \_\_\_\_\_
4. OTC \_\_\_\_\_
5. Hx \_\_\_\_\_
6. MHP \_\_\_\_\_
7. C&S \_\_\_\_\_
8. decub \_\_\_\_\_
9. BCC \_\_\_\_\_
10. SubQ \_\_\_\_\_



### Learning Style Tip

If you are self-conscious about speaking aloud while studying, then find a private, secluded area like the back corner of the library, an empty classroom, or even your car.

## Pathologies, Procedures, and Pharmacology

### Pathology Terms

Table 4-4 lists many of the pathology terms that pertain to the integumentary system.

**TABLE 4-4**

#### PATHOLOGY TERMS

<b>abrasion</b> (ă-BRĀ-zhŭn)	scraping away of skin or mucous membranes
<b>acne</b> (ĂK-nē)	disease of the sebaceous (oil) glands and hair follicles in the skin, marked by plugged pores, pimples, cysts, and nodules on the face, neck, chest, back, and other areas
<b>actinic keratosis</b> (ăk-TĪ-nĭk kēr-ă-TŌ-sĭs)	precancerous condition in which rough, scaly patches of skin develop, most commonly on sun-exposed areas such as the scalp, neck, face, ears, lips, hands, and forearms; also known as <i>solar keratosis</i>

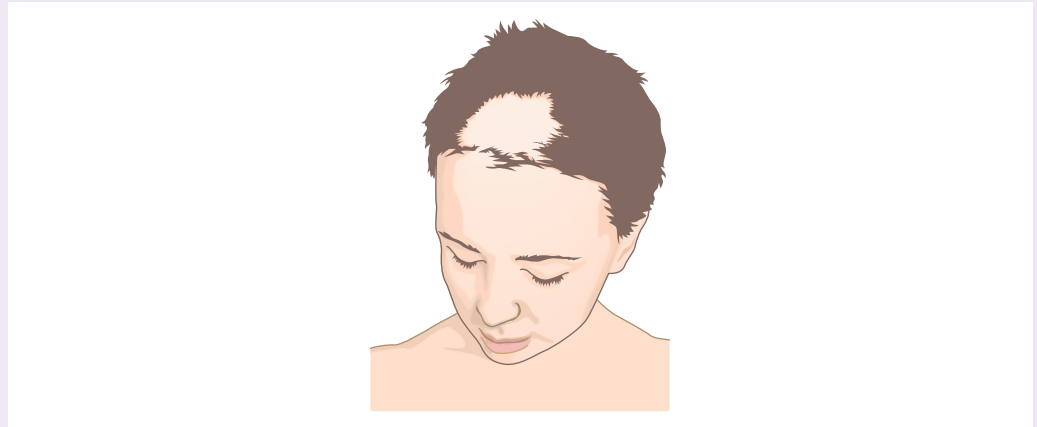
*Continued*

TABLE 4-4

## PATHOLOGY TERMS—cont'd

**alopecia** (ă-lō-PĒ-shē-ă)

autoimmune disease that results in loss of hair; alopecia areata causes patchy hair loss from the scalp; alopecia totalis causes total scalp hair loss; alopecia universalis causes total body hair loss

**Alopecia.****basal cell carcinoma**

(BĀ-sāl sēl kār-sĭ-NŌ-mă)

common type of skin cancer that typically appears as a small, shiny papule and eventually enlarges to form a whitish border around a central depression or ulcer that may bleed

**bull**a (BŪ-lă)

large blister or skin vesicle filled with fluid

**burn** (bŭrn)

type of thermal injury to the skin caused by a variety of heat sources; classified according to severity as first-degree (superficial), second-degree (partial-thickness), and third-degree (full-thickness)

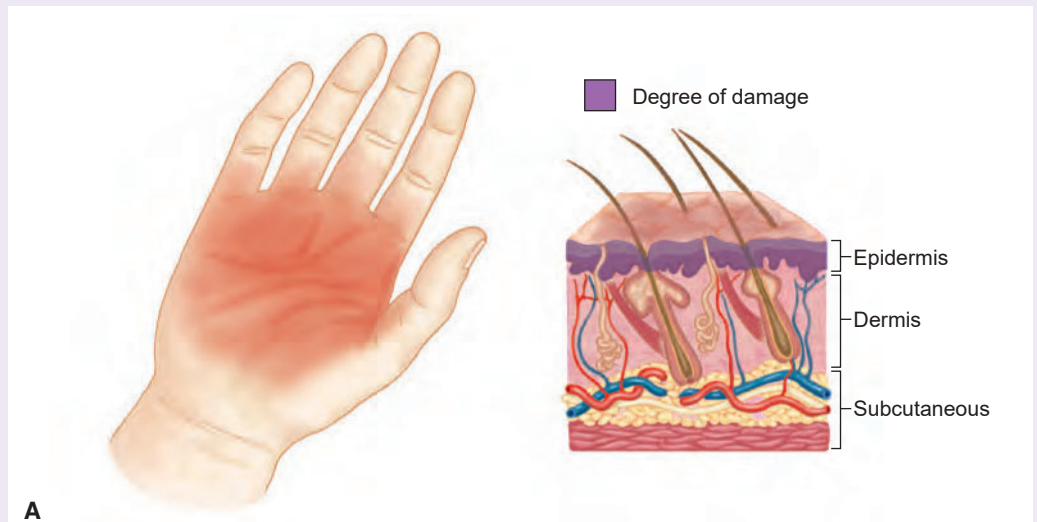
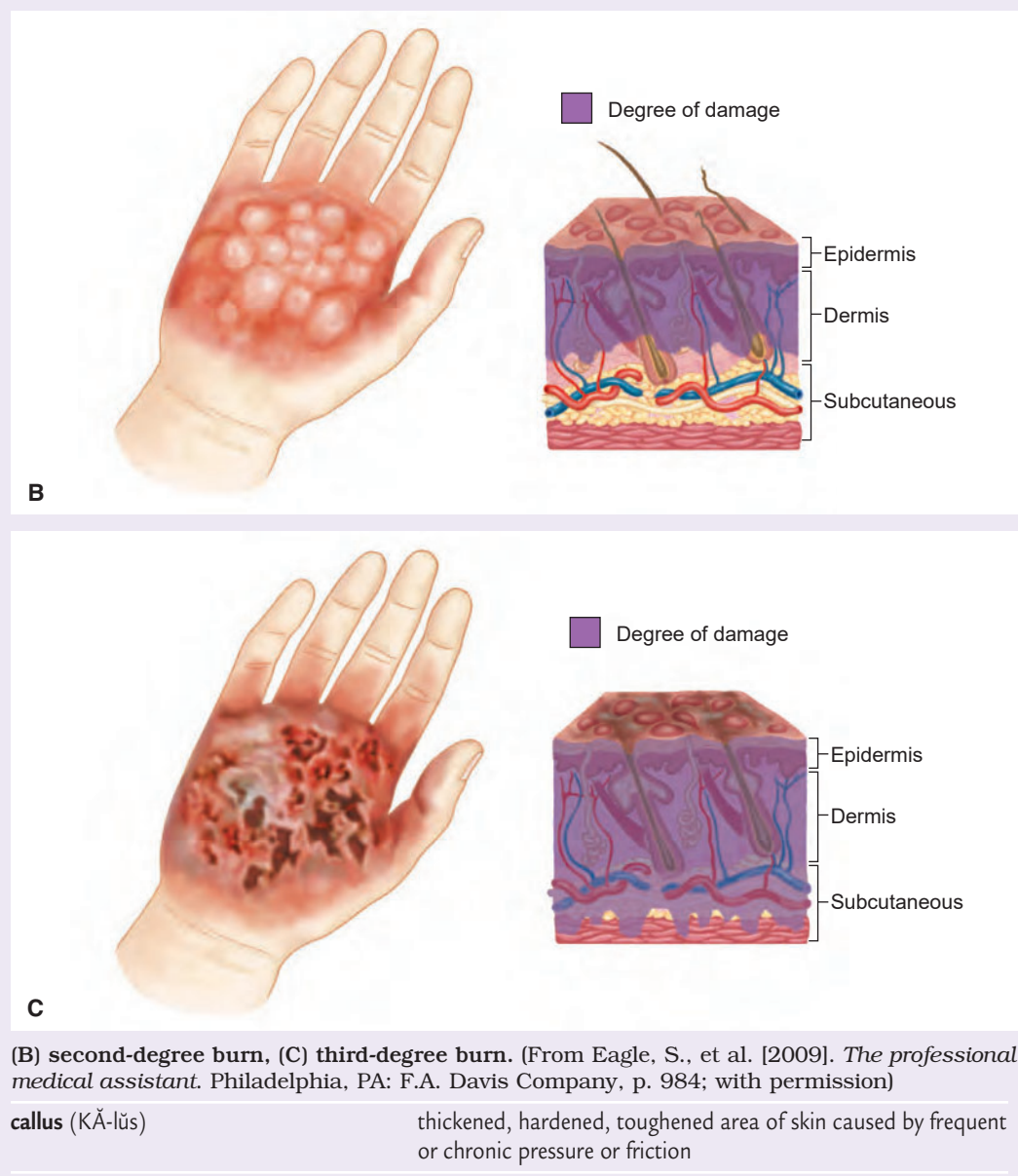
**A****Burn:** (A) first-degree burn.

TABLE 4-4

## PATHOLOGY TERMS—cont'd



Continued

TABLE 4-4

## PATHOLOGY TERMS—cont'd

**carbuncle** (KĂR-bŭng-kul)

very large furuncle or cluster of connected furuncles

**Carbuncle.** (Photograph © Thinkstock)**cellulitis** (sĕl-ŭ-LĪ-tĭs)

potentially serious bacterial skin infection marked by pain, redness, edema, warmth, and fever

**comedo** (KŎ-mĕ-dŏ)

blackhead

**corn** (kŏrn)

small callus that develops on smooth, hairless skin surfaces, such as the backs of fingers or toes, in response to pressure and friction; hard corns typically develop on the sides of feet and tops of toes; soft corns usually develop between toes

**Corn.****cyst** (sĭst)

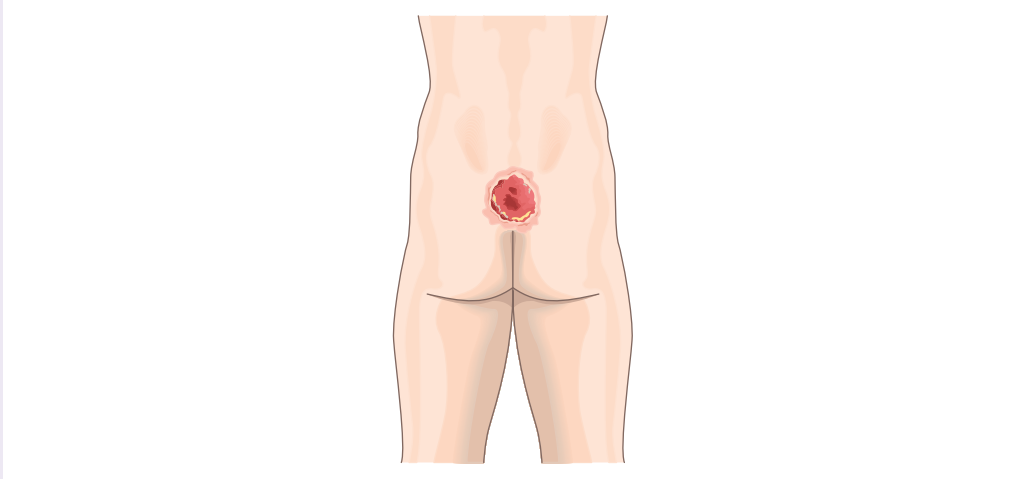
fluid- or solid-containing pouch in or under the skin

TABLE 4-4

## PATHOLOGY TERMS—cont'd

**decubitus ulcer** (dē-KŪ-bĭ-tŭs ŪL-sĕr)

area of injury and tissue death caused by unrelieved pressure that impedes circulation in the skin and underlying tissues; also called *pressure ulcer* or *bedsore*

**Decubitus ulcer.****ecchymosis, contusion**

(ĕ-kĭ-MŌ-sĭs, kŏn-TOO-zhŭn)

discoloration of the skin, bruise

**Ecchymosis.** (Photograph © Thinkstock)*Continued*

TABLE 4-4

## PATHOLOGY TERMS—cont'd

**eczema** (ĔK-zĕ-mă)

inflammatory skin condition marked by red, hot, dry, scaly, cracked, and itchy skin or blisters

**Eczema.** (Photograph © Thinkstock)**epidermoid cyst**

(ĕ-pĭ-DĔR-moyd sĭst)

small sac or pouch below the skin surface containing a thick, cheesy substance; appears pale white or yellow but can be darker in dark-skinned people

**fissure** (FĪSH-ūr)

small, cracklike break in the skin

**folliculitis** (fō-lĭ-kū-LĪ-tĭs)

inflammation of hair follicles, marked by rash with small red bumps, pustules, tenderness, and itching; common on the neck, armpit, and groin area

**frostbite** (FRŌST-bĭt)

injury that occurs when skin tissues are exposed to temperatures cold enough to cause them to freeze

**Frostbite.****furuncle** (FŪR-ŭng-kul)infection of a hair follicle and nearby tissue, also called a *boil*; more invasive than folliculitis because it involves the sebaceous gland

TABLE 4-4

## PATHOLOGY TERMS—cont'd

**impetigo** (im-pĕ-TĪ-gō)

bacterial skin infection marked by yellow to red weeping, crusted, or pustular lesions; common in children

**Impetigo.****incision** (in-SĪ-zhŭn)

surgical cut in the flesh

**laceration** (lās-ĕ-RĀ-shŭn)

cut or tear in the flesh

**Lyme disease** (lĭm dĩ-ZĒZ)

bacterial infection transmitted by ticks, marked by erythema chronicum migrans, a red, circular rash that slowly expands and enlarges; untreated disease causes multisystem symptoms

**macule** (MĀ-kŭl)

flat, discolored spot on the skin, such as a freckle

**Macule.** (Photograph © Thinkstock)*Continued*

TABLE 4-4

## PATHOLOGY TERMS—cont'd

<b>malignant melanoma</b> (mă-LĪG-nănt mē-lă-NŌ-mă)	aggressive form of skin cancer that often begins as various-colored, asymmetrical lesions larger than 6 mm in diameter
<b>melasma</b> (mē-LĂZ-mă)	development of irregular areas of darker-pigmented skin on the forehead, nose, cheek, and upper lip; also called <i>chloasma</i> or the <i>mask of pregnancy</i>
<b>papule</b> (PĂP-ūl)	small, raised spot or bump on the skin, such as a mole



Papule. (Photograph © Thinkstock)

<b>paronychia</b> (păr-ō-NĪK-ē-ă)	acute or chronic infection of the margins of the fingernail or toenail, marked by warmth, erythema, edema, pus, throbbing, pain, or tenderness; causes the nail to become discolored and thickened
<b>pediculosis</b> (pě-dĭk-ū-LŌ-sĭs)	infestation of head, body, or pubic lice, marked by itching, the appearance of lice on the body, and eggs (nits) attached to hair shafts
<b>petechiae</b> (pě-TĒ-kē-ē)	tiny red or purple hemorrhagic spots (singular <i>petechia</i> )

Petechiae. (From Goldsmith, L.A., et al. [1997]. *Adult and pediatric dermatology: a color guide to diagnosis and treatment*. Philadelphia, PA: F.A. Davis Company, p. 61; with permission)

TABLE 4-4

## PATHOLOGY TERMS—cont'd

**psoriasis** (sō-RĪ-ă-sĭs)

chronic, inflammatory skin disorder marked by the development of silvery-white scaly plaques or patches with sharply defined borders and reddened skin beneath



**Psoriasis.** (Photograph © Thinkstock)

**puncture** (PŪNGK-chūr)

hole or wound made by a sharp, pointed instrument

**pustule** (PŪS-tūl)

small, pus-filled blister

**rosacea** (rō-ZĀ-sē-ă)

chronic condition that causes flushing and redness of the face, neck, and chest



**Rosacea.**

*Continued*

TABLE 4-4

## PATHOLOGY TERMS—cont'd

**scabies** (SKĀ-bēz)

contagious skin disease transmitted by the itch mite, with symptoms of itching, scaly papules, insect burrows, and secondary infected lesions most prevalent in skin folds at the wrists and elbows, between the fingers, under the arms, in the groin, and under the beltline

**scales** (skālz)

area of skin that is excessively dry and flaky

**Scales.** (Photograph © Thinkstock)**sebaceous cyst** (sē-BĀ-shūs sĭst)

small sac or pouch below the skin surface filled with a thick fluid or semisolid oily substance called sebum

**seborrheic keratosis**

(sē-bō-RĒ-ĭk kēr-ă-TŌ-sĭs)

benign, flat, irregularly shaped skin growths of various colors with a warty, waxy, “stuck-on” appearance

**squamous cell carcinoma**

(SKWĀ-mūs sĕl kār-sĭ-NŌ-mă)

type of cancer that usually appears in the mouth, esophagus, bronchi, lungs, or vagina and uterine cervix, marked by a firm, red nodule or a scaly appearance; may ulcerate

**tinea** (Tĭ-nē-ă)

fungal skin disease occurring on various parts of the body, also called *dermatophytosis* or *ringworm*; forms include tinea capitis (scalp), tinea corporis (trunk), tinea cruris (genital area; also called *jock itch*), tinea nodosa (mustache and beard), tinea pedis (feet; also called *athlete's foot*), and tinea unguium (nails)

**Tinea.** (From *Taber's cyclopedic medical dictionary* [21st ed.; 2009]. Philadelphia, PA: F. A. Davis Company, p. 2324; with permission)

TABLE 4-4

## PATHOLOGY TERMS—cont'd

<b>ulcer</b> (ŪL-sēr)	lesion of the skin or mucous membranes, marked by inflammation, necrosis, and sloughing of damaged tissues
<b>vesicle</b> (VĔS-ĭ-kul)	clear, fluid-filled blister
<b>vitaligo</b> (vīt-ĭl-Ī-gō)	chronic skin disease that results in patchy loss of skin pigment; may also affect hair color and cause white patches or streaks



**Vitiligo.** (From Goldsmith, L.A., et al. [1997]. *Adult and pediatric dermatology: a color guide to diagnosis and treatment*. Philadelphia, PA: F.A. Davis Company, p. 121; with permission)

<b>wart</b> (wōrt)	small, benign skin tumor caused by various strains of the human papillomavirus (HPV); appearance varies from tiny to moderate-sized bumps or cauliflower-shaped growths
<b>wheel</b> (hwēl)	rounded, temporary elevation in the skin, white in the center with a red-pink periphery and accompanied by itching

## Learning Style Tip

Collect photos and illustrations of pathological conditions from journals, Internet image search engines, and other sources to create a poster or collage. Be sure to write the name of each disorder and a brief description next to each image. Tape the poster somewhere that you will see it daily, and review the information on it at least once each day.

### IN A FLASH!

Go to the *DavisPlus* website to print out the Pathology Term Flash Cards for Chapter 4 and run through them at least three times before you continue.

### Flashpoint

An easy way to remember the difference between a papule and a macule is that you can **palpate** (touch or feel) a **papule** but not a macule.

## Common Diagnostic Tests and Procedures

**Biopsy:** Removal of a tissue sample for microscopic examination

### Cosmetic Enhancement Procedures

**Dermabrasion:** Removal of small scars, nevi (moles), tattoos, or fine wrinkles with a wire brush or burr impregnated with diamond particles, leaving a smoother surface

**Dermaplaning:** Removal of small scars, nevi (moles), tattoos, or fine wrinkles with a dermatome (a device resembling an electric razor), leaving a smoother surface

**Microdermabrasion:** Similar to dermabrasion but less invasive, involving multiple treatments of gentle abrasion; useful in reducing fine lines, nevi (moles), age spots, and acne scars

**Chemical peel:** Application of a chemical solution to the skin to improve appearance by removing blemishes, fine wrinkles, uneven pigmentation, scars, and tattoos

**Laser resurfacing:** Use of short pulses of light to remove fine lines and damaged skin and to minimize scars and even out areas of uneven pigmentation; sometimes called a *laser peel*

**BOTOX (botulinum toxin):** An injection into selected muscles of the face that interferes with muscle contraction, thereby reducing the appearance of wrinkles

## Pharmacology

Table 4-5 provides a list of common integumentary system medications.

Therapeutic Classification	Generic Name	Brand Name	Common Use
Anti-acne agent	benzoyl peroxide	Benoxyl, Benzac, Desquam, Fostex, Triaz, Vanoxide, Zoderm	Reduce amount of acne-causing bacteria
Antibacterial	mupirocin	Bactroban, Centany	Kill bacteria or prevent its growth
	clindamycin	Cleocin	Kill bacteria or prevent its growth
Antifungal agent	ketoconazole	Nizoral	Kill fungus or prevent its growth
	terbinafine	Lamisil	
	clotrimazole	Lotrimin	Interfere with the formation of the fungal cell membrane
	fluconazole	Diflucan	
Antipsoriatic	anthralin	Drithocrema, Micanol, Psoriatec, Zithranol	Slow down the growth of skin cells
Immunosuppressant	adalimumab	Humira	Block tumor necrosis factor (TNF)
	etanercept	Enbrel	

TABLE 4-5

## PHARMACOLOGY—cont'd

Therapeutic Classification	Generic Name	Brand Name	Common Use
	ustekinumab	Stelara	
	methotrexate	Trexall	Interfere with the growth of skin cells
Keratolytic	salicylic acid	Duofilm, Virasil	Dissolve the substance that causes skin cells to stick together
Retinoid	tazarotene	Tazorac	Decrease inflammation and other skin changes
	tretinoin	Atralin, Renova, Retin-A	Keep skin pores clear; treat sun damage



## Learning Style Tip

Locate images from journals or websites and glue them to 3-by-5-inch cards to make flash cards for any pathological condition or procedure for which you don't have cards. Review them daily.

## Pathologies, Procedures, and Pharmacology Practice Exercises

### Deciphering Terms

Write the correct meaning of these medical terms.

#### Exercise 5

1. cyanoderma \_\_\_\_\_
2. sclerotic \_\_\_\_\_
3. hyperkeratosis \_\_\_\_\_
4. leukocytopenia \_\_\_\_\_
5. hypodermic \_\_\_\_\_
6. erythrocyte \_\_\_\_\_
7. dermatology \_\_\_\_\_
8. melanocyte \_\_\_\_\_

9. trichomycosis \_\_\_\_\_
10. hypertrophy \_\_\_\_\_
11. xeroderma \_\_\_\_\_
12. xanthoma \_\_\_\_\_
13. lipolysis \_\_\_\_\_
14. adiposis \_\_\_\_\_
15. onychoma \_\_\_\_\_

### Fill in the Blanks

---

Fill in the blanks below using pathology terms from Table 4-4.

#### Exercise 6

1. The term that means *scraping away of skin* is \_\_\_\_\_.
2. Terms that mean *discoloration of the skin* or *bruise* are \_\_\_\_\_ and \_\_\_\_\_.
3. The term that means *tiny hemorrhagic spot* is \_\_\_\_\_.
4. \_\_\_\_\_ is a skin infection marked by yellow to red crusted or pustular lesions.
5. \_\_\_\_\_ causes patchy loss of skin pigmentation.
6. A \_\_\_\_\_ is a clear, fluid-filled lesion, such as a blister.
7. A \_\_\_\_\_ is a small, pus-filled blister.
8. The medical name for a blackhead is \_\_\_\_\_.
9. \_\_\_\_\_ is a contagious skin disease transmitted by the itch mite.
10. A small raised spot or bump, such as a mole, is a \_\_\_\_\_.
11. \_\_\_\_\_ results in loss of body hair.
12. A \_\_\_\_\_ is a cut or tear in the flesh.
13. A \_\_\_\_\_ is a small, cracklike break in the skin.
14. \_\_\_\_\_ is an inflammatory skin disease that causes redness, itching, and blisters.

15. A \_\_\_\_\_ is a flat, discolored spot on the skin, such as a freckle.
16. A bacterial skin infection marked by pain, redness, edema, warmth, and fever is called \_\_\_\_\_.
17. The medical name for the fungal infection of the skin commonly known as ringworm is \_\_\_\_\_.
18. \_\_\_\_\_ describes an area of the skin that is excessively dry and flaky.
19. A \_\_\_\_\_ is a fluid- or solid-containing pouch in or under the skin.
20. A \_\_\_\_\_ is a thickened, hardened, toughened area of skin caused by frequent or chronic pressure or friction.

## Multiple Choice

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Select the one best answer to the following multiple-choice questions.

### Exercise 7

1. Which of the following terms is **not** paired with the correct meaning?
  - a. erythr/o: red
  - b. xanth/o: white
  - c. melan/o: black
  - d. cyan/o: blue
2. Which of the following abbreviations is **not** paired with the correct meaning?
  - a. Bx: biopsy
  - b. Tx: treatment
  - c. PE: physical examination
  - d. FA: family history
3. Which of the following pathology terms is **not** paired with the correct meaning?
  - a. abrasion: scraping away of skin or mucous membranes
  - b. contusion: bruise
  - c. macule: small, raised spot or bump on the skin
  - d. cellulitis: bacterial skin infection

4. Which of the following pathology terms is **not** paired with the correct meaning?
- a. comedo: blackhead
  - b. cyst: fluid- or solid-containing pouch in or under the skin
  - c. pustule: small, pus-filled blister
  - d. fissure: surgical cut in the flesh
5. Which of the following pathology terms is **not** paired with the correct meaning?
- a. eczema: inflammatory skin disease with redness, itching, and blisters
  - b. scabies: contagious skin disease transmitted by the itch mite
  - c. impetigo: patchy loss of skin pigmentation
  - d. tinea: fungal skin disease occurring on various parts of the body

### Fill in the Blanks

---

Using Table 4-5, write the therapeutic classification of the medication next to each generic or brand name.

#### Exercise 8

1. etanercept \_\_\_\_\_
2. clindamycin \_\_\_\_\_
3. salicylic acid \_\_\_\_\_
4. Stelara \_\_\_\_\_
5. Retin-A \_\_\_\_\_
6. Lamisil \_\_\_\_\_
7. methotrexate \_\_\_\_\_
8. benzoyl peroxide \_\_\_\_\_
9. fluconazole \_\_\_\_\_
10. Drithocrema \_\_\_\_\_

## CASE STUDY

Read the case study and answer the questions that follow. Most of the terms are included in this chapter. Refer to your medical dictionary for the other terms.

### Cellulitis

Herbert Marshall is a 56-year-old man admitted to the hospital with a severe case of cellulitis. Mr. Marshall has a history of chronic tinea pedis, which he usually treats with OTC medications. When he awoke yesterday, his left foot was erythematous, hot, and tender. He applied an OTC antifungal cream, hoping that would improve his condition. However, today he presented at the clinic complaining of throbbing pain in his foot. The Sx of inflammation have worsened, including increased erythema and edema of the foot and lower leg. After completing a PE, the physician made a diagnosis of cellulitis and admitted Mr. Marshall to the hospital for IV antibiotic Tx.

**Cellulitis** is an infection of the skin, usually caused by streptococcal or staphylococcal bacteria entering through a break in the skin. Common symptoms include erythema, heat, edema, and tenderness. Treatment for mild cases is oral antibiotics. Severe cases usually require IV antibiotic therapy. Surgical debridement, medical removal of dead tissue, may also be necessary.

### Case Study Questions

#### Exercise 9

1. Mr. Marshall's foot has become more:
  - a. blue
  - b. red
  - c. dry
  - d. yellow
2. Mr. Marshall's foot has also become:
  - a. swollen
  - b. hardened
  - c. bruised
  - d. scaly
3. The physician performed a:
  - a. biopsy
  - b. treatment
  - c. physical examination
  - d. incision and drainage
4. Mr. Marshall was admitted to the hospital for:
  - a. treatment
  - b. a biopsy
  - c. surgery
  - d. a subcutaneous injection
5. The antibiotics will be administered to Mr. Marshall by:
  - a. subcutaneous injection
  - b. intradermal injection
  - c. intramuscular injection
  - d. intravenous injection

6. Mr. Marshall has a history of chronic:
  - a. dry, flaky skin
  - b. blackheads
  - c. loss of skin pigmentation
  - d. athlete's foot
7. The abbreviation Sx stands for:
  - a. symptom(s)
  - b. biopsy
  - c. treatment
  - d. injection
8. Cellulitis is usually an infection of the:
  - a. hair
  - b. skin
  - c. fingernails or toenails
  - d. glands
9. Cellulitis is caused by:
  - a. a virus
  - b. poor hygiene
  - c. bacteria
  - d. exposure to cold temperatures
10. Cellulitis may be treated with:
  - a. oral antibiotics
  - b. intravenous antibiotics
  - c. surgery
  - d. all of these
11. If you had a painful, tender, and swollen foot, it is likely that you would hesitate to use the foot or put any weight on it. Discuss how this would affect activities of daily living (ADLs) for you and for others around you. What if you lived alone?

## End-of-Chapter Practice Exercises

### Word Building

Using **only** the word parts in the lists provided, create medical terms with the indicated meanings.

#### Exercise 10

##### Prefixes

circum-  
epi-  
hypo-

##### Combining Forms

adip/o  
albin/o  
cyan/o  
cyt/o  
dermat/o  
derm/o  
erythr/o

##### Suffixes

-al  
-cyte  
-derma  
-ectomy  
-emia  
-ic  
-ism

kerat/o	-oid
leuk/o	-oma
lip/o	-osis
melan/o	-penia
myc/o	-tic
necr/o	
onych/o	
trich/o	
scler/o	
xanth/o	
xer/o	

1. resembling fat \_\_\_\_\_
2. pertaining to dry skin \_\_\_\_\_
3. condition of whiteness \_\_\_\_\_
4. abnormal condition of yellowness \_\_\_\_\_
5. pertaining to the skin \_\_\_\_\_
6. pertaining to above or upon the skin \_\_\_\_\_
7. abnormal condition of skin fungus \_\_\_\_\_
8. deficiency of red (blood) cells \_\_\_\_\_
9. abnormal condition of blueness of the skin \_\_\_\_\_
10. hardening of the skin \_\_\_\_\_
11. abnormal condition of hair fungus \_\_\_\_\_
12. abnormal condition of keratinized tissue \_\_\_\_\_
13. white (condition of) blood \_\_\_\_\_
14. abnormal condition of nail fungus \_\_\_\_\_
15. black tumor \_\_\_\_\_
16. pertaining to death \_\_\_\_\_
17. pertaining to beneath the skin \_\_\_\_\_
18. surgical removal of fat \_\_\_\_\_
19. fat cell \_\_\_\_\_
20. dry skin \_\_\_\_\_

## True or False

Decide whether the following statements are true or false.

### Exercise 11

1. True False **Laser resurfacing** involves the use of short pulses of light to remove fine lines and damaged skin and to minimize scars.
2. True False In **dermaplaning**, a surgeon scrapes away the outermost layer of skin using a wire brush or burr impregnated with diamond particles.
3. True False In a **BOTOX** procedure, a small amount of toxin is injected into selected muscles of the face.
4. True False A **biopsy** involves the removal of a tissue sample for microscopic examination.
5. True False The abbreviation for **biopsy** is BSY.
6. True False The abbreviation **ID** stands for *incision and drainage*.
7. True False The abbreviation for **physical examination** is Px.
8. True False The abbreviation **Tx** stands for *treatment*.
9. True False The abbreviation **FH** stands for *family history*.
10. True False The abbreviation **SubQ** stands for *sclerosis*.

## Deciphering Terms

---

Write the correct meaning of these medical terms.

### Exercise 12

1. hidrotic \_\_\_\_\_
2. morphogenesis \_\_\_\_\_
3. hydrous \_\_\_\_\_
4. mycoid \_\_\_\_\_
5. cirrhotic \_\_\_\_\_
6. chromatogram \_\_\_\_\_
7. leukopenia \_\_\_\_\_

8. sonography \_\_\_\_\_
9. rhytidoplasty \_\_\_\_\_
10. pathophobia \_\_\_\_\_

## Multiple Choice

---

Select the one best answer to the following multiple-choice questions.

### Exercise 13

- Which of the following terms is matched with the correct definition?
  - adip/o: acne
  - cutane/o: cell
  - necr/o: dead
  - myc/o: macule
- Which of the following terms is matched with the correct definition?
  - seb/o: sweat
  - son/o: shape
  - cyan/o: cause
  - xanth/o: yellow
- Which of the following terms is matched with the correct definition?
  - dermat/o: dead
  - cyt/o: cell
  - idi/o: cause
  - leuk/o: large
- Which of the following terms is matched with the correct definition?
  - xer/o: white
  - albin/o: hardening
  - chromat/o: cornea
  - erythr/o: red
- Which of the following terms is matched with the correct definition?
  - hidr/o: water
  - morph/o: malignant
  - onych/o: nail
  - rhytid/o: hair

6. Which of the following terms is matched with the correct definition?
- a. SCC: subcutaneous
  - b. Bx: treatment
  - c. ID: incision and drainage
  - d. ung: ointment
7. Which of the following terms is matched with the correct definition?
- a. cirrh/o: blue
  - b. xer/o: dry
  - c. melan/o: malignant
  - d. trich/o: treatment
8. Which of the following terms is matched with the correct definition?
- a. PE: probable etiology
  - b. Sx: treatment
  - c. FH: hair fungus
  - d. MM: malignant melanoma
9. Which of the following terms is matched with the correct definition?
- a. lip/o: skin
  - b. eti/o: unknown
  - c. hydr/o: sweat
  - d. pil/o: hair
10. Which of the following terms is matched with the correct definition?
- a. kerat/o: cyst
  - b. dermat/o: skin
  - c. path/o: papule
  - d. scler/o: scales
11. Which of the following terms means *abnormal condition of nail softening*?
- a. cyanoderma
  - b. onychomycosis
  - c. hyperhidrosis
  - d. none of these

12. The term *rhytidoplasty* means:
- examination of the nasal passages
  - abnormal condition of excessive wrinkles
  - plastic surgery of the nose
  - elimination of wrinkles by plastic surgery
13. A patient is most likely to visit a dermatologist to undergo dermaplaning for which of the following disorders?
- acne
  - alopecia areata
  - carbuncle
  - cyst
14. Which of the following is a malignant condition?
- actinic keratosis
  - bulla
  - folliculitis
  - basal cell carcinoma
15. Which of the following is the result of accidental injury?
- callus
  - melasma
  - paronychia
  - abrasion
16. All of the following skin problems are related to excess pressure except:
- corn
  - callus
  - fissure
  - decubitus ulcer
17. All of the following are infections of the skin **except**:
- petechiae
  - furuncle
  - impetigo
  - pustule

18. All of the following procedures involve removal of tissue **except**:
- a. biopsy
  - b. dermaplaning
  - c. dermabrasion
  - d. BOTOX
19. Which of the following helps to remove fine lines or wrinkles?
- a. laser resurfacing
  - b. microdermabrasion
  - c. dermaplaning
  - d. all of these
20. Which of the following is done to aid in diagnosis?
- a. microdermabrasion
  - b. BOTOX
  - c. biopsy
  - d. none of these