

CHAPTER

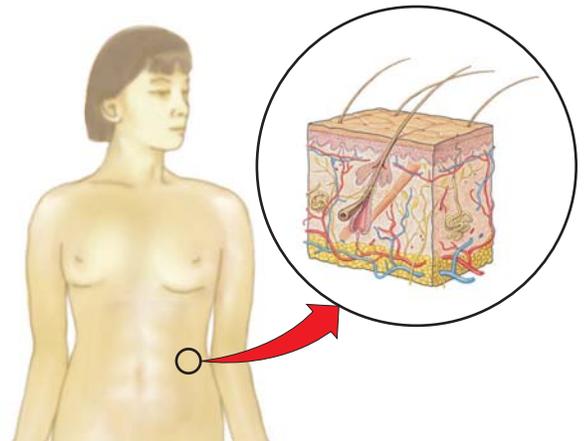
4

The Integumentary System

► DERMATOLOGY

After studying this chapter, you will be able to:

- 4.1 Name the parts of the integumentary system and discuss the function of each part
- 4.2 Define the combining forms used in building words that relate to the integumentary system
- 4.3 Identify the meaning of related abbreviations
- 4.4 Name the common diagnoses, laboratory tests, and clinical procedures used in testing and treating disorders of the integumentary system
- 4.5 List and define the major pathological conditions of the integumentary system
- 4.6 Define surgical terms related to the integumentary system
- 4.7 List common pharmacological agents used in treating disorders of the integumentary system



Structure and Function

The integumentary system includes the skin or **integument**, the *hair*, the **nails**, the **sweat glands** (also called the *sudoriferous glands*), and the oil-producing glands (also called the **sebaceous glands**). This system covers and protects the body, helps regulate the body's temperature, excretes some of the body's waste materials, and includes the body's sensors for pain and sensation. Figure 4-1a shows a cross-section of skin with the parts of the integumentary system labeled. Figure 4-1b is a diagram showing the three layers of skin and what they contain.

Skin

The skin is the largest body organ. The average adult has about 21.5 square feet of skin. The four major functions of the skin are:

1. It protects the body from fluid loss and injury and from the intrusion of harmful microorganisms and ultraviolet (UV) rays of the sun.
2. It helps to maintain the proper internal temperature of the body.
3. It serves as a site for excretion of waste materials through perspiration.
4. It is an important sensory organ.

The skin varies in thickness, depending on what part of the body it covers and what its function is in covering that part. For example, the skin on the

FIGURE 4-1a The integumentary system consists of the skin with all its layers, hair, nails, and glands.

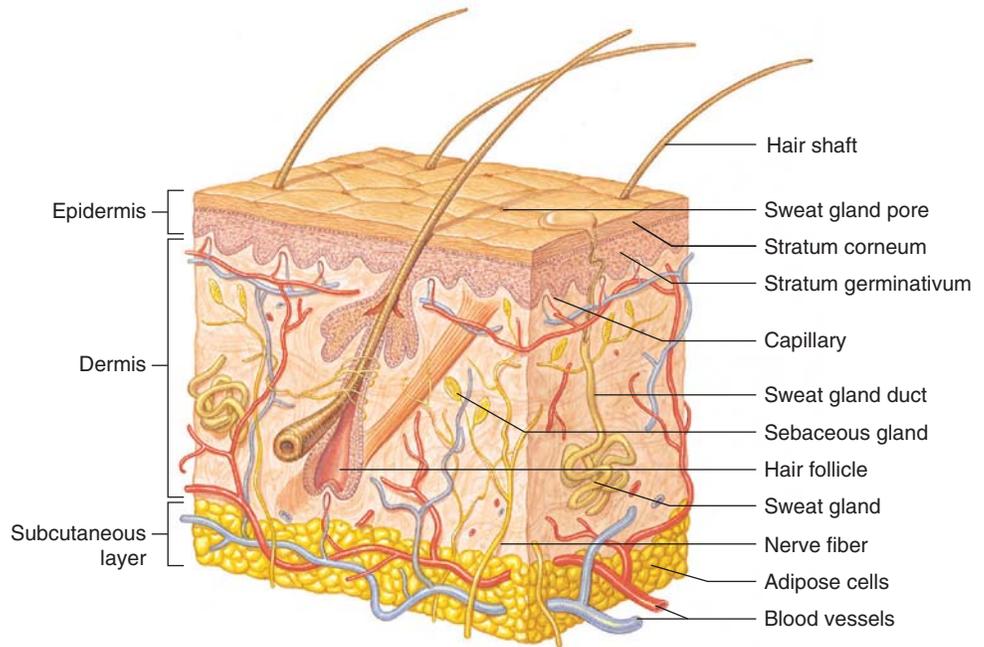
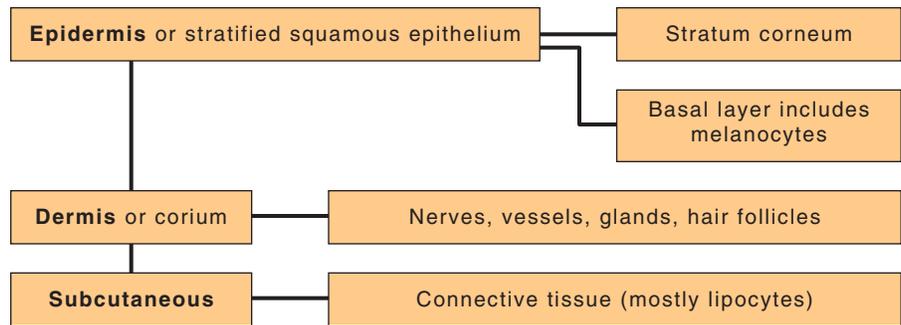


FIGURE 4-1b A diagram showing the three layers of skin and what they contain.



upper back is about ten times thicker than the skin on the eyelid. The eyelid skin must be light, flexible, and movable, so it is thin. The skin on the upper back must cover and move with large muscle groups and bones, so it is thick to provide the necessary strength and protection.

The skin has three main parts or layers—the **epidermis**, the **dermis** or **corium**, and the **subcutaneous layer** or **hypodermis**.

Epidermis

The epidermis, the outer layer of skin, ranges from 1/200 to 1/20 of an inch thick, and consists of several **strata** (sublayers). The epidermis is made up of cells called **squamous epithelium**, a flat, scaly layer of cells. The layers that make up the squamous epithelium are called **stratified squamous epithelium**.

Not all parts of the body's skin contain all the sublayers of epidermis. The top sublayer is called the **stratum corneum**. It consists of a flat layer of dead cells arranged in parallel rows. As new cells are produced, the dead cells are sloughed off. As they die, the cells in the stratum corneum fill with **keratin**—a waterproof barrier to keep microorganisms out and moisture in. The keratin of the epidermis is softer than the hard keratin in nails. Dead

skin cells on the surface fall off naturally as replacement cells rise from the base layers. Dead skin can also be removed by *exfoliation* or *desquamation*, the falling off in layers or scales, especially of skin. This is sometimes done for cosmetic reasons as exfoliation of the facial skin using an abrasive cloth or substance.

The bottom sublayer of the epidermis is called the **stratum germinativum**. Here new cells are produced and pushed up to the stratum corneum. The epidermis itself is a nonvascular layer of skin, meaning that it does not contain blood vessels.

Specialized cells called **melanocytes** produce a pigment called **melanin**, which helps to determine skin and hair color. Melanin is essential in screening out ultraviolet rays of the sun that can harm the body's cells.

Dermis

The dermis (also called the corium) contains two sublayers, a thin top one called the **papillary layer**, and a thicker one called the **reticular layer**. The dermis contains connective tissue that holds many capillaries, lymph cells, nerve endings, sebaceous and sweat glands, and hair follicles. These nourish the epidermis and serve as sensitive touch receptors. The connective tissue is composed primarily of **collagen** fibers that form a strong, elastic network. Collagen is a protein substance that is very tough, yet flexible. When the collagen fibers stretch, they form **striae** or stretch marks.

Subcutaneous Layer or Hypodermis

The subcutaneous layer is the layer between the dermis and the body's inner organs. It consists of **adipose** (or fatty) tissue and some layers of fibrous tissue. Within the subcutaneous layers lie blood vessels and nerves. The layer of fatty tissue serves to protect the inner organs and to maintain the body's temperature.

Hair

Hair grows out of the epidermis to cover various parts of the body. Hair serves to cushion and protect the areas it covers. Figure 4-2 shows a detail of hair growing out of the epidermis. Hair has two parts. The **hair shaft** protrudes from the skin, and the **hair root** lies beneath the surface of the skin. The shaft is composed of outer layers of scaly cells filled with inner layers of soft and hard keratin. Hair grows upward from the root through the **hair**

MORE ABOUT . . .

Skin Color

All people have melanin (except those with albinism). The darker the skin, the more melanin is produced. There are many variations in skin color within each racial group, but some overall characteristics are unique to each racial group. For example, African-American people have high melanin levels; Asians have low melanin and high *carotene* (a pigment that is converted to vitamin A in the body) levels; Caucasians have comparatively low melanin levels. The rates of skin cancer go down as the amount of available melanin goes up.

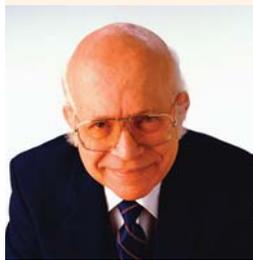


FIGURE 4-2 Detail of hair growing out of the epidermis.

MORE ABOUT . . .

Hair Growth and Baldness

Scalp hair grows about 1 millimeter in length every 3 days for anywhere from two to four years at a time. Then, the hair stops growing for 3 to 4 months during a dormant phase. Normally, between 10 and 100 hairs fall out every day. The fastest growth stage is from adolescence until the early 40s. Eyelash and eyebrow hair grow for only 3 to 4 months. As these hairs shed, they are replaced by new hairs that grow for only a few months, so they remain short as compared to scalp hair.



Hair loss occurs for a variety of reasons, such as emotional trauma, poor nutrition, disease, reaction to medication, radiation, or chemotherapy, or as part of a genetic code. *Pattern baldness* is a condition in which some parts of the scalp become devoid of hair while others retain hair. This patterning results from heredity and hormones. A man inherits the tendency for pattern baldness from his mother.

follicles (tubular sacs that hold the hair fibers). The shape of the follicle determines the shape of the hair (straight, curly, or wavy). Hair color is determined by the presence of melanin, which is produced by the melanocytes in the epidermis. Gray hair occurs when melanocytes stop producing melanin. Hair growth, thickness, and curliness are generally determined by heredity. In addition to heredity, baldness or **alopecia** may result from disease, injury, or medical treatment (such as chemotherapy). A general term for removal of hair by the roots is *epilation* or *depilation*. Such removal may be the result of some kind of injury or it may be done voluntarily to remove unwanted hair.

Nails

Nails are plates made of hard keratin that cover the dorsal surface of the distal bone of the fingers and toes. Nails serve as a protective covering, help in the grasping of objects, and allow us to scratch. Healthy nails appear pinkish because the translucent nail covers vascular tissue. At the base of most nails, a **lunula**, or whitish half-moon, is an area where keratin and other cells have mixed with air. Nails are surrounded by a narrow band of epidermis called a **cuticle**, except at the top. The top portion of the nail grows above the level of the finger.

Glands

The integumentary system includes various types of glands. The glands in the skin are:

1. The sweat glands (also called sudoriferous glands) are found almost everywhere on the body surface. Glands that secrete outward toward the surface of the body through ducts are called **exocrine glands**. The excretion of sweat is called **diaphoresis**. Secretions exit the body through **pores** or tiny openings in the skin surface. Sweat (also called *perspiration*) is composed of water and sodium chloride and other compounds

MORE ABOUT . . .

Nail Health

The nails sometimes offer a picture of inner health. In the photo on the left, the normal nails are healthy and pinkish, with no discolorations or white spots. The nail in the photo on the right have been altered by a fungal infection.



depending on many factors, such as external temperature, fluid intake, level of activity, hormonal levels, and so on.

2. **Eccrine** (or small sweat) **glands** are found on many places of the body. They excrete a colorless fluid that keeps the body at a constant temperature.

3. The **apocrine glands** appear during and after puberty and secrete sweat from the armpits, near the reproductive organs, and around the nipples.

The female breast, which contains *mammary glands*, is itself a specialized type of apocrine gland that is adapted to secreting milk after childbirth (Figure 4-3).

4. **Ceruminous glands** are a specialized gland in the surface of the ear that secretes *cerumen*, a waxy substance that lubricates and protects the ear.
5. **Sebaceous glands**, located in the dermis, secrete an oily substance called **sebum**, which is found at the base of the hair follicles. This substance serves to lubricate and protect the skin. Sebum forms a skin barrier against bacteria and fungi and also softens the surface of the skin.

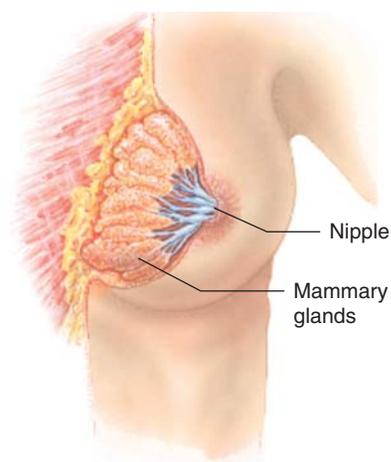


FIGURE 4-3 The female breast is a specialized type of apocrine gland.

VOCABULARY REVIEW

In the previous section, you learned terms relating to the integumentary system. Before going on to the exercise section, review the terms below and refer back to the previous section if you have any questions. Pronunciations are provided for certain terms. Sometimes information about where the word came from is included after the term. The etymologies (word histories) are for your information only. You do not need to memorize them.

Term	Definition
adipose [ÄD-ĭ-pōs]	Fatty; relating to fat.
alopecia [äl-ō-PĒ-shē-ă] Greek <i>alopekia</i> , mange	Lack of hair in spots; baldness.
apocrine [ÄP-ō-krĭn] glands Greek <i>apo-krino</i> , to separate	Glands that appear during and after puberty and secrete sweat, as from the armpits.
ceruminous [sĕ-RŪ-mĭn-ŭs] glands	Glands that secrete a waxy substance on the surface of the ear.

Term	Definition
collagen [KÖL-lă-jěn] Greek <i>koila</i> , glue + -gen	Major protein substance that is tough and flexible and that forms connective tissue in the body.
corium [KŌ-rē-ŭm]	See dermis.
cuticle [KYŪ-tĭ-kl]	Thin band of epidermis that surrounds the edge of nails, except at the top.
dermis [DĚR-mĭs]	Layer of skin beneath the epidermis containing blood vessels, nerves, and some glands.
diaphoresis [DĪ-ă-fō-RĚ-sĭs]	Excretion of fluid by the sweat glands; sweating.
eccrine [ĚK-rĭn] glands Greek <i>ek-krino</i> , to separate	Sweat glands that occur all over the body, except where the apocrine glands occur.
epidermis [ĕp-ĭ-DĚR-mĭs] <i>epi-</i> , upon + <i>dermis</i> , layer of skin	Outer portion of the skin containing several strata.
exocrine [ĚK-sō-krĭn] glands <i>exo-</i> , outside + Greek <i>krino</i> , to separate	Glands that secrete through ducts toward the outside of the body.
hair follicle [FŎL-ĭ-kl]	Tubelike sac in the dermis out of which the hair shaft develops.
hair root	Portion of the hair beneath the skin surface.
hair shaft	Portion of the hair visible above the skin surface.
hypodermis [hĭ-pō-DĚR-mĭs] <i>hypo-</i> , under + <i>dermis</i> , layer of skin	Subcutaneous skin layer; layer below the dermis.
integument [ĭn-TĚG-yŭ-mĕnt] Latin <i>integumentum</i> , covering	Skin and all the elements that are contained within and arise from it.
keratin [KĚR-ă-tĭn]	Hard, horny protein that forms nails and hair.
lunula (<i>pl.</i> , lunulae) [LŪ-nŭ-lă (LŪ-nŭ-lĕ)] Latin, little moon	Half-moon shaped area at the base of the nail plate.
melanin [MĚL-ă-nĭn]	Pigment produced by melanocytes that determines skin, hair, and eye color.
melanocyte [MĚL-ă-nō-sĭt] <i>melano-</i> , black + <i>cyte</i> , cell	Cell in the epidermis that produces melanin.
nail	Thin layer of keratin that covers the distal portion of fingers and toes.
papillary [PĂP-ĭ-lăr-ĕ] layer	Thin sublayer of the dermis containing small papillae (nipple-like masses).
pore	Opening or hole, particularly in the skin.
reticular [rĕ-TĚK-yŭ-lăr] layer	Bottom sublayer of the dermis containing reticula (network of structures with connective tissue between).

Term	Definition
sebaceous [sĕ-BĀ-shŭs] glands	Glands in the dermis that open to hair follicles and secrete sebum.
sebum [SĒ-bŭm] Latin <i>sebum</i> , tallow	Oily substance, usually secreted into the hair follicle.
squamous epithelium [SKWĀ-mŭs ěp-ĭ-THĒ-lĕ- ŭm]	Flat, scaly layer of cells that makes up the epidermis.
stratified squamous epithelium	Layers of epithelial cells that make up the strata of epithelium of the epidermis.
stratum (<i>pl.</i> , strata) [STRĀT-ŭm (STRĀ-tă)] Latin <i>stratum</i> , layer, bed cover	Layer of tissue, especially a layer of the skin.
stratum [KÖR-nĕ-ŭm] corneum	Top sublayer of the epidermis.
stratum germinativum [jĕr-mĭ-NĀT-ĭ-vŭm]	Bottom sublayer of the epidermis.
striae [STRĪ-ĕ] Latin, plural of <i>stria</i> , furrow	Stretch marks made in the collagen fibers of the dermis layer.
subcutaneous [sŭb-kyŭ-TĀ-nĕ-ŭs] layer sub-, beneath + Latin <i>cutis</i> , skin	Bottom layer of the skin containing fatty tissue.
sweat glands	Coiled glands of the skin that secrete perspiration to regulate body temperature and excrete waste products.

CASE STUDY

The Dermatologist's Office

Madeline Charles arrived at the office a few minutes early. She knew that Dr. Lin had a busy morning scheduled, and she wanted to set up before the doctor arrived. As secretary to Dr. Lin, Madeline handles incoming calls, scheduling, billing, new patient information forms, and insurance matters. She reports to James Carlson, the CMA and office manager for this small office. James assists the doctor with patients, oversees the work Madeline does, and helps when Madeline's load is too great. This morning, the first three patients are scheduled at 8:30, 9:00, and 9:30. Madeline looks at the schedule, realizes that one of the patients is new, and gets the folders for the other two. She sets up the clipboard with the forms the new patient will have to complete and attaches the privacy practices statement of the office (a requirement of the HIPAA laws). She had previously asked the new patient to arrive 15 minutes early in order to have time to fill out the necessary forms.

Bob Luis, the first patient, is 48 years old and has a long history of diabetes (a disease of the endocrine system discussed in Chapter 15). He sees Dr. Lin several times a year for treatment of skin irritations that do not seem to heal. Yesterday, Mr. Luis called with a specific problem. He has an extensive rash on his left ankle. It sounded serious enough to warrant an appointment for the next morning. When Mr. Luis arrives, James escorts him to an examination room and helps him prepare for his visit.

Critical Thinking

1. What do we know about Mr. Luis's condition that would warrant an immediate appointment with Dr. Lin?
2. Does a dermatologist treat a disease such as diabetes, or only symptoms related to the integumentary system?

STRUCTURE AND FUNCTION EXERCISES

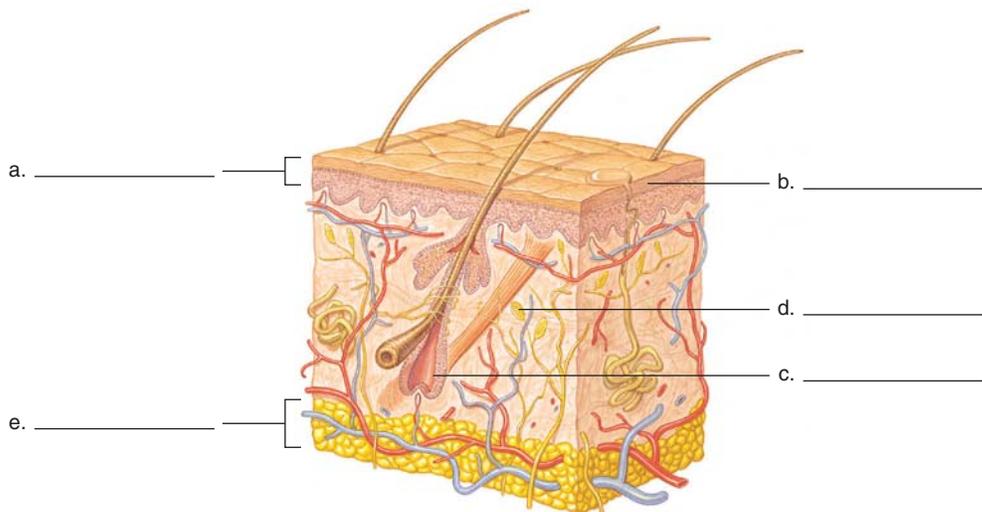
Build Your Medical Vocabulary

- The dermis is a layer of skin. Using your knowledge of prefixes learned in Chapter 2, put the following words in order according to how close they are to the outside of the body.
 - hypodermis _____
 - epidermis _____
 - dermis _____
- Name three types of glands, two of which were compound terms even in ancient Greece.

Complete the Diagram

- Fill in the missing labels on the figure shown here.

- _____
- _____
- _____
- _____
- _____



Fill in the Blanks

Complete the sentences below by filling in the blank(s).

- The thin layer of skin around the edge of a nail is called a(n) _____.
- A hair follicle is in the _____ (layer of the skin).
- The outer layer of skin is the _____.
- The top sublayer of the dermis is called _____.
- Small sweat glands found all over the body are called _____ glands.
- The subcutaneous layer consists of _____ tissue.
- A pinkish nail is a sign of a(n) _____ nail.
- The area where keratin and other cells mix with air under the nail is called the _____.
- Sebaceous glands secrete _____.
- The female breast is a(n) _____ gland.

Match the Terms

Write the letter of the meaning of the term in the space provided.

- | | |
|-------------------|--|
| 16. ___ adipose | a. layer of skin beneath the epidermis containing blood vessels, nerves, and some glands |
| 17. ___ collagen | b. hard, horny protein that forms nails and hair |
| 18. ___ cuticle | c. oily substance, usually secreted into the hair follicle |
| 19. ___ dermis | d. thin band of epidermis that surround the edge of nails, except the top |
| 20. ___ epidermis | e. pigment produced by melanocytes that determines skin, hair, and eye color |
| 21. ___ keratin | f. outer portion of the skin containing several strata |
| 22. ___ lunula | g. stretch marks made in the collagen fibers of the dermis layer |
| 23. ___ melanin | h. fatty, relating to fat |
| 24. ___ sebum | i. half-moon shaped area at the base of the nail |
| 25. ___ striae | j. major protein substance that is tough and flexible and that forms connective tissue in the body |

Know Your Glands

Write the letter of the glands that match the description.

- | | |
|---------------------------|--|
| 26. ___ apocrine glands | a. glands that secrete a waxy substance on the surface of the ear |
| 27. ___ ceruminous glands | b. glands in the dermis that open to hair follicles and secrete an oily substance |
| 28. ___ eccrine glands | c. glands that secrete through ducts toward the outside of the body |
| 29. ___ exocrine | d. glands that appear during and after puberty and secrete sweat |
| 30. ___ sebaceous glands | e. sweat glands that occur all over the body, except where apocrine glands occur |
| 31. ___ sweat glands | f. coiled glands of the skin that secrete perspiration to regulate body temperature and excrete waste products |

Combining Forms and Abbreviations

The tables below include combining forms and abbreviations that relate specifically to the integumentary system. Pronunciations are included for the examples.

COMBINING FORM	MEANING	EXAMPLE
adip(o)	fatty	<i>adiposis</i> [ăd-ĭ-PŌ-sĭs], excessive accumulation of body fat
dermat(o)	skin	<i>dermatitis</i> [dĕr-mă-TĪ-tĭs], inflammation of the skin

COMBINING FORM	MEANING	EXAMPLE
derm(o)	skin	<i>dermabrasion</i> [dĕr-mă-BRĀ-zhŭn], surgical procedure to remove acne scars and marks, using an abrasive product to remove part of the skin
hidr(o)	sweat, sweat glands	<i>hidrosis</i> [hĭ-DRŌ-sĭs], production and excretion of sweat
ichthy(o)	fish, scaly	<i>ichthyosis</i> [ĭk-thĕ-Ō-sĭs], congenital skin disorder characterized by dryness and peeling
kerat(o)	horny tissue	<i>keratosis</i> [kĕr-ă-TŌ-sĭs], skin lesion covered by a horny layer of tissue
lip(o)	fatty	<i>liposuction</i> [lĭp-ŏ-SŪK-shŭn], removal of unwanted fat by suctioning through tubes placed under the skin
melan(o)	black, very dark	<i>melanoma</i> [mĕl-ă-NŌ-mă], malignancy arising from cells that form melanin
myc(o)	fungus	<i>mycosis</i> [mĭ-KŌ-sĭs], any condition caused by fungus
onych(o)	nail	<i>onychotomy</i> [ŏn-ĭ-KŌT-ŏ-mĕ] incision into a nail
pil(o)	hair	<i>pilocystic</i> [pĭ-lŏ-SĪS-tĭk], relating to a skin cyst with hair
seb(o)	sebum, sebaceous glands	<i>seborrhea</i> [sĕb-ŏ-RĒ-ă], excessive sebum caused by overactivity of the sebaceous glands
steat(o)	fat	<i>steatitis</i> [stĕ-ă-TĪ-tĭs], inflammation of fatty tissue
trich(o)	hair	<i>trichopathy</i> [trĭ-KŌP-ă-thĕ], disease of the hair
xanth(o)	yellow	<i>xanthoma</i> [zăn-THŌ-mă], yellow growth or discoloration of the skin
xer(o)	dry	<i>xeroderma</i> [zĕr-ŏ-DĒR-mă], excessive dryness of the skin

ABBREVIATION	MEANING	ABBREVIATION	MEANING
bx	biopsy (see surgical terms on page 92)	PUVA	psoralen—ultraviolet A light therapy (used in the treatment of some disorders such as psoriasis)
DLE	discoid lupus erythematosus (see pathological terms on page 85)	SLE	systemic lupus erythematosus (see pathological terms on page 88)
MRSA	A form of staphylococcus aureus that is resistant to a common group of antibiotics that include methicillin, penicillin, and amoxicillin.	VRE	A form of enterococcus that is resistant to most antibiotics
PPD	purified protein derivative (of tuberculin)		

CASE STUDY

Understanding Information

While Dr. Lin is examining his first patient, Bob Luis, the new patient arrives for her 9:00 appointment. Madeline explains which parts of the forms have to be filled out, asks for the patient's insurance card so she can copy it, and completes the file for Dr. Lin before 9:00. Meanwhile, Dr. Lin hands Madeline his notes with a diagnosis for Bob Luis, including a new prescription for treatment of xeroderma. In addition, Dr. Lin gives Mr. Luis samples of a cream to relieve itching.

Critical Thinking

32. Why does the new patient have to fill out forms with questions about family history?
33. Mr. Luis is to be given samples of a prescription cream to try. Can the medical assistant decide which samples to give him?

COMBINING FORMS AND ABBREVIATIONS EXERCISES

Build Your Medical Vocabulary

Build a word for each of the following definitions. Use the combining form vocabulary review in this chapter and the combining forms you have learned earlier.

34. Plastic surgery of the skin: _____
35. Inflammation of the skin and veins: _____
36. Horny growth on the epidermis: _____
37. Fungal eruption on the skin: _____
38. Excess pigment in the skin: _____
39. Fungal infection of the nail: _____
40. Surgical repair of the nail: _____
41. Of the hair follicles and sebaceous glands: _____
42. Pigment-producing cell: _____
43. Examination of the hair: _____
44. Removal of fat by cutting: _____
45. Relating to both fatty and cellular tissue: _____
46. Study of hair: _____
47. Disease of the nail: _____
48. Poison produced by certain fungi: _____
49. Virus that infects fungi: _____
50. Yellow coloration of the skin: _____
51. Condition of extreme dryness: _____
52. Removal or shedding of the horny layer of the epidermis: _____
53. Abnormally darkened skin: _____
54. Lessening of the rate of sweating: _____
55. A doctor who specializes in the diagnosis and treatment of the skin: _____
56. Nail biting: _____
57. Causing the growth of horny tissue or skin and hair: _____
58. The formation of sweat: _____
59. A skin disorder characterized by dry flaking or scaling of the skin: _____
60. The study of fungus: _____
61. Any disease of the skin: _____
62. Hardening of the skin: _____
63. Grafting of skin from one part of the body to another: _____
64. Inflammation of the nail bed: _____
65. Fear of loose hairs on the clothing or elsewhere: _____

66. A tumor of the sebaceous glands:

67. Abnormal sensitivity (of the skin) to light:

68. A rapidly spreading (malignant) skin tumor that arises from a pigment-producing cell in the skin:

69. Another term for *fatty* tissue: _____

Root Out the Meaning

Separate the following terms into word parts; define each word part.

70. trichoma _____

71. xerosis _____

72. mycocide _____

73. xanthoderma _____

74. onychoid _____

75. dermatofibroma _____

76. onychomalacia _____

77. hypodermic _____

78. erythroderma _____

79. pachyderma _____

80. mycogenic _____

81. xeroderma _____

82. trichomycosis _____

83. lipoma _____

84. onychocryptosis _____

Diagnostic, Procedural, and Laboratory Terms

The field of **dermatology** studies, diagnoses, and treats ailments of the skin. The first diagnostic test is usually visual observation of the surface of the skin. Clinical procedures and laboratory tests can result in diagnosis and treatment of specific skin conditions.

Diagnostic Procedures and Tests

Once a visual assessment has been made, the dermatologist determines which procedures and tests will help find the underlying cause of a skin problem. Samples of **exudate** (material that passes out of tissues) or pus may be sent to a laboratory for examination. The laboratory can determine what types of bacteria are present. A scraping may also be taken and placed on a growth medium to be examined for the presence of fungi.

Skin is a reliable place to test for various diseases and allergies. A suspected **allergen**, something that provokes an allergic reaction, is mixed with a substance that can be used in tests. That substance containing the allergen is called an **antigen**. Skin tests are typically performed in one of three ways:

1. The **patch test** calls for placing a suspected antigen on a piece of gauze and applying it to the skin. If a reaction results, the test is considered positive.
2. The **scratch test** (in which a suspected antigen is scratched onto the skin, and redness or swelling within ten minutes indicates a positive reaction).

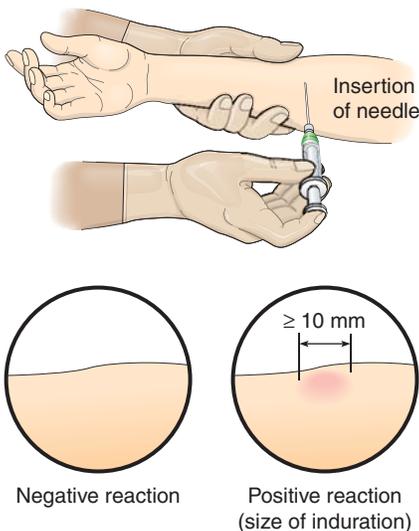


FIGURE 4-4 A Mantoux test is performed by injecting a small dose of tuberculin intradermally. A positive result is a small raised bump on the skin. No reaction indicates that tuberculosis is not present.

3. The **intradermal test** (in which a suspected antigen is injected between layers of skin). Infectious diseases may also be detected by an intradermal test. Some common intradermal tests are:
 - a. The **Mantoux test** for diagnosing tuberculosis. In the Mantoux test, **PPD** (a purified protein derivative of tuberculin) is injected intradermally. Figure 4-4 shows a Mantoux test.
 - b. The **tine test** (also called **TB tine**), a screening test for tuberculosis, injects the tuberculin using a tine (an instrument with a number of pointed ends).
 - c. The **Schick test** is a test for diphtheria, in which a small amount of toxin is injected into the skin of one arm and a small amount of deactivated toxin is injected into the skin of the other arm for comparison.

The American Lung Association (www.lungusa.org) has extensive information about tuberculosis.

VOCABULARY REVIEW

In the previous section, you learned terms relating to diagnosis, clinical procedures, and laboratory tests. Before going on to the exercise section, review the terms below and refer to the previous section if you have questions. Pronunciations are provided for certain terms. Sometimes information about where the word came from is included after the term. The etymologies (word histories) are for your information only. You do not need to memorize them.

Term	Definition
dermatology [dĕr-mă-TŌL-ō-jē] dermato-, skin + -logy, study	Medical specialty that deals with diseases of the skin.
exudate [ĔKS-yū-dāt] ex-, out + Latin <i>sudo</i> , sweat	Any fluid excreted out of tissue, especially fluid excreted out of an injury to the skin.
intradermal [ĪN-tră-DĔR-māl] test intra, within + derm(o)-, skin	Test that injects antigen or protein between layers of skin.
Mantoux [măn-TŪ] test	Test for tuberculosis in which a small dose of tuberculin is injected intradermally with a syringe.
patch test	Test for allergic sensitivity in which a small dose of antigen is applied to the skin on a small piece of gauze.
PPD	Purified protein derivative of tuberculin.
Schick [shĭk] test	Test for diphtheria.
scratch test	Test for allergic sensitivity in which a small amount of antigen is scratched onto the surface of the skin.
tine [tĭn] test , TB tine	Screening test for tuberculosis in which a small dose of tuberculin is injected into a series of sites within a small space with a tine (instrument that punctures the surface of the skin).

CASE STUDY

Testing for Allergic Reactions

Several days ago, Dr. Lin had given a series of scratch tests to a teenager who had allergic skin rashes. The doctor had noted all the places where redness or swelling appeared within ten minutes.

He had also noted the negative reactions, where no changes appeared within thirty minutes. There were also some mild, inconclusive reactions. Dr. Lin reviewed the results of the tests. He asked Madeline to send a report to the patient and to set up a phone appointment to discuss the results. Madeline thought the results looked interesting. She didn't know that people could be allergic to so many things at once. However, Madeline knows she

cannot discuss this patient's case with anyone not allowed to see that specific medical record. So, while it may be something interesting to talk to some of her friends about, she will not say anything.

Critical Thinking

85. What does a negative reaction to a scratch test indicate?
86. If the patient avoids the allergens that gave the most positive reactions, what is likely to happen to the rashes?

DIAGNOSTIC, PROCEDURAL, AND LABORATORY TERMS EXERCISES

Check Your Knowledge

Circle T for true and F for false.

87. The Mantoux test detects allergies. T F
88. An intradermal test may detect an infectious disease. T F
89. PPD is used in the Mantoux test. T F
90. An intradermal injection usually reaches into the hypodermis. T F
91. Visual observation of the skin is a diagnostic tool. T F

Fill in the Blanks

Complete the sentences below by filling in the blanks.

92. A scraping from the skin is placed on a growth medium to detect the presence of _____.
93. Samples of _____ may be sent to a laboratory for examination.
94. Scratch tests are often used to detect _____.
95. Suspected antigens are injected between layers of skin in a(n) _____ test.

Pathological Terms

At the Skin Cancer Foundation's Web site (www.skincancer.org), you can find out a lot about the different kinds of skin cancers.

The skin is a place where both abnormalities occur and some internal diseases show dermatological symptoms. **Lesions** are areas of tissues that are altered because of a pathological condition. Primary lesions appear on previously normal skin. Secondary lesions are abnormalities that result from changes in primary lesions. **Vascular lesions** are blood vessel lesions that show through the skin. Figure 4-5 shows various types of skin lesions.

Some common primary lesions are areas of discoloration, such as a **macule** (freckle or flat mole) or **patch**. Elevated, solid masses include:

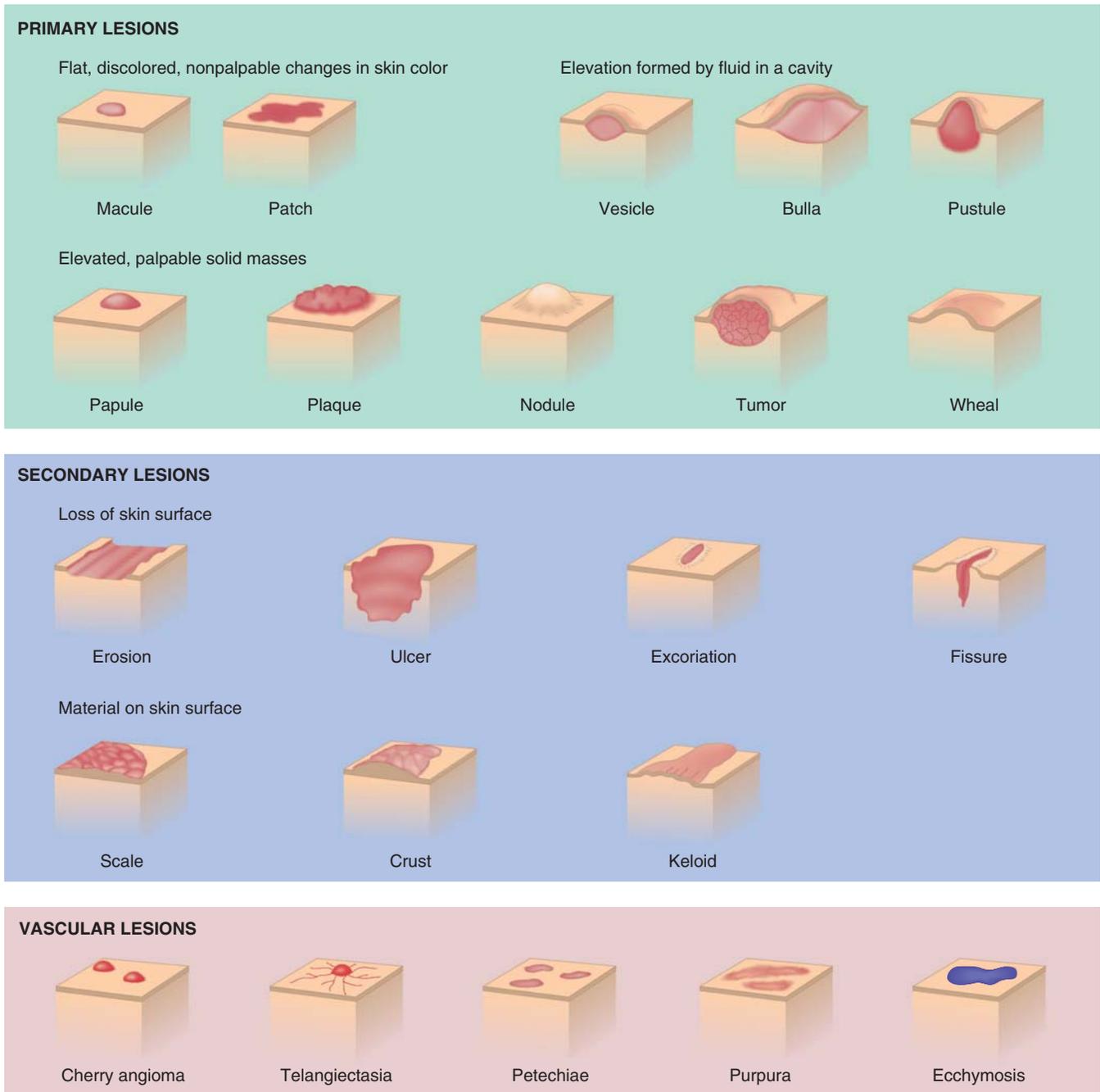


FIGURE 4-5 Various types of skin lesions.

papule, a small elevated mass, also called a *pimple*; **plaque**, a small patch on the skin; **nodule**, a large pimple or a small node; **polyp**, any mass that projects upward, either on a slender stalk (**pediculated polyp**) or from a broad base (**sessile polyp**); **tumor**, any swelling or, specifically, any abnormal tissue growth; and **wheal**, a smooth, slightly elevated area, usually associated with allergic itching. A **bullae**, a large blister; a **pustule**, a small elevated mass containing pus; and a **vesicle**, a small mass containing fluid, are all elevated skin pockets filled with fluid. A **cyst** may be solid or filled with fluid or gas. A **pilonidal cyst** contains hairs, and a **sebaceous cyst** contains yellow sebum.

Secondary lesions usually involve either loss of skin surface or material that forms on the skin surface. Lesions that involve loss of skin surface are: **erosion**, a shallow area of the skin worn away by friction or pressure; **excoriation**, a scratched area of the skin, usually covered with dried blood; **fissure**, a deep furrow or crack in the skin surface; and **ulcer**, a wound with loss of tissue and often with inflammation, especially **decubitus ulcers** or **pressure sores**, which are chronic ulcers on skin over bony parts that are under constant pressure, as when someone is bedridden or wheelchair-bound. Lesions that form surface material are: **scale**, thin plates of epithelium formed on the skin's surface; **crust**, dried blood or pus that forms on the skin's surface; and **keloid**, a firm, raised mass of scar tissue. A **cicatrix**, a general word for scar, usually refers to internal scarring (as a lesion on the brain) or growth inside a wound.

Vascular lesions may be a result of disease, aging, or a vascular disturbance. A **cherry angioma** is a dome-shaped vascular lesion that usually occurs on the skin of elderly people. **Telangiectasia** is an area with a permanent dilation of the small blood vessels that usually appears on the skin.

The National Skin Centre in Singapore (www.nsc.gov.sg) provides a guide to many skin diseases.

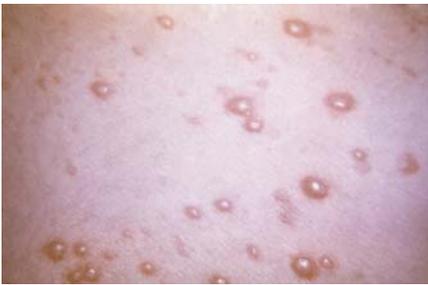


FIGURE 4-6 Pustules typical of chicken pox.

Symptoms, Abnormalities, and Conditions

Symptoms of disease can appear on the skin. For example, **exanthematous viral diseases** are rashes that develop during a viral infection. Other common viral rashes are: **rubeola**, measles with an accompanying rash; **rubella**, disease with a rash caused by the rubella virus (also known as *German measles*); **roseola**, disease with small, rosy patches on the skin, usually caused by a virus; and **varicella**, disease with a rash known as *chicken pox*, caused by the varicella virus. Chicken pox (Figure 4-6) does not usually cause harm (other than possible scarring) in young children. However, young adult males who become infected may become sterile.

Infectious agents, such as staphylococci, may cause **impetigo**, which is a **pyoderma**, or pus-containing, contagious skin disease. At times, staphylococci infections can become deadly, as is the case with flesh-eating bacteria (known as necrotizing fasciitis), a fatal type of staph infection.

Fungi may cause **tinea** or **ringworm** (Figure 4-7), a skin condition that causes intense **pruritus** or itching. **Candidiasis** is a yeast fungus that causes

MORE ABOUT . . .

Infections

Necrotizing fasciitis is a rare but very serious infection that involves the skin and soft tissue of the body. The infection is most commonly caused by the bacterial organism *Streptococcus pyogenes*. This bacterial organism, which is a type of Strep A bacteria, is also responsible for strep throat and impetigo infections. It is commonly known as the “skin-eating” bacteria. Sufferers of this infection usually have weakened immune systems, chronic health problems, non-intact skin due to wounds or surgery, certain viral infections such as chickenpox, and/or have been on extended steroid medication use that can lower the body's immune system. The infection develops quickly and requires immediate action and hospitalization. Treatments include care for shock, respiratory problems, and kidney failure. Surgery is required in most cases as is extensive use of antibiotics to kill the bacteria.

common rashes such as diaper rash. Other common fungi are *tinea pedis* or athlete's foot; *tinea capitis*, scalp ringworm; and *tinea barbae*, ringworm of the beard. Some autoimmune diseases, such as **pemphigus**, cause skin blistering.

Skin conditions, particularly skin irritations or **dermatitis**, can reflect systemic allergies or diseases. **Urticaria** or **hives** may arise from many causes, such as a food allergy; itching or pruritus can also be the result of allergies. **Eczema** is an acute form of dermatitis often caused by allergies.

Ecchymosis (plural, **ecchymoses**) is a bluish-purple skin mark that may result from a skin injury that can cause blood to leak out of blood vessels. **Petechiae** are tiny, pinpoint ecchymoses. **Purpura** is a condition with extensive hemorrhages into the skin covering a wide area. Purpura starts out with red areas, which turn purplish, and then brown, in a couple of weeks. **Rosacea** is a vascular disorder that appears as red blotches on the skin, particularly around the nose and cheeks.

Some diseases, infections, or inflammations cause skin conditions, such as a **furuncle**, a localized, pus-producing infection originating in a hair follicle; a **carbuncle**, a pus-producing infection that starts in subcutaneous tissue and is usually accompanied by fever and an ill feeling; **abscess**, a localized infection usually accompanied by pus and inflammation; and **gangrene**, necrosis (death) of tissue due to loss of blood supply.

Some skin areas lack color, which may be the result of **depigmentation**, partial or complete loss of pigment; **leukoderma**, white patches on the skin; or **vitiligo**, patches with loss of pigment surrounded by patches with extensive pigment. These conditions often indicate a systemic autoimmune disease. A rare congenital condition called **albinism** causes either extensive or total lack of pigmentation. People with albinism often have very white, almost translucent, skin and white hair. A pigmented skin lesion found at birth is a **nevus** (plural, **nevi**) or **birthmark**. **Chloasma** is a group of fairly large, pigmented facial patches, often associated with pregnancy.

Some viruses cause skin problems. In some cases, these viruses are STDs, or sexually transmitted diseases (such as some types of **herpes** and genital warts). (Sexually transmitted diseases are discussed with the female and male reproductive systems, covered in Chapters 10 and 11.) **Herpes simplex virus Type 1**, **herpes simplex virus Type 2**, and **herpes zoster** are all viral diseases caused by herpes viruses. Herpes 1, also called **cold sores** or **fever blisters**, usually appears around the mouth. Herpes 2, also known as **genital herpes**, affects the genital area. Herpes zoster or **shingles** is an inflammation that affects the nerves on one side of the body and results in skin blisters. It can be extremely painful. A virus may also cause a **wart** or **verruca**. A **plantar wart** appears on the soles of the feet.

Lupus, a chronic disease with erosion of the skin, may appear in different forms. Two common forms are **DLE** or **discoid lupus erythematosus**, a mild form of lupus that usually causes only superficial eruption of the skin, and **SLE** or **systemic lupus erythematosus**, a chronic inflammation of the collagen in the skin and joints that usually causes inflammation of connective tissue throughout the body and is often accompanied by fever, weakness, arthritis, and other serious symptoms. Inflammation of the dermis and subcutaneous skin layers is called **cellulitis** (Figure 4-8), which can spread infection via the blood to the brain.

Other skin conditions include **acne** (also called **acne vulgaris**), a skin condition with eruptions on the face and upper back. Acne usually starts around puberty and is often caused by overproduction of sebum. It usually



FIGURE 4-7 Skin showing ringworm.



FIGURE 4-8 Cellulitis.

includes several types of skin eruptions, such as **comedones** or **blackheads**, **whiteheads**, pustules, and nodules.

Scleroderma is a chronic disease with abnormal thickening of the skin caused by the formation of new collagen. **Psoriasis**, a recurrent skin condition with scaly lesions on the trunk, arms, hands, legs, and scalp, is often associated with stress. **Seborrhea**, a condition with excessive production of sebum, is a result of overactivity of the sebaceous glands. *Seborrheic dermatitis* (also called *dandruff*), scaly eruptions on the face or scalp, is due to the overproduction of seborrhea.

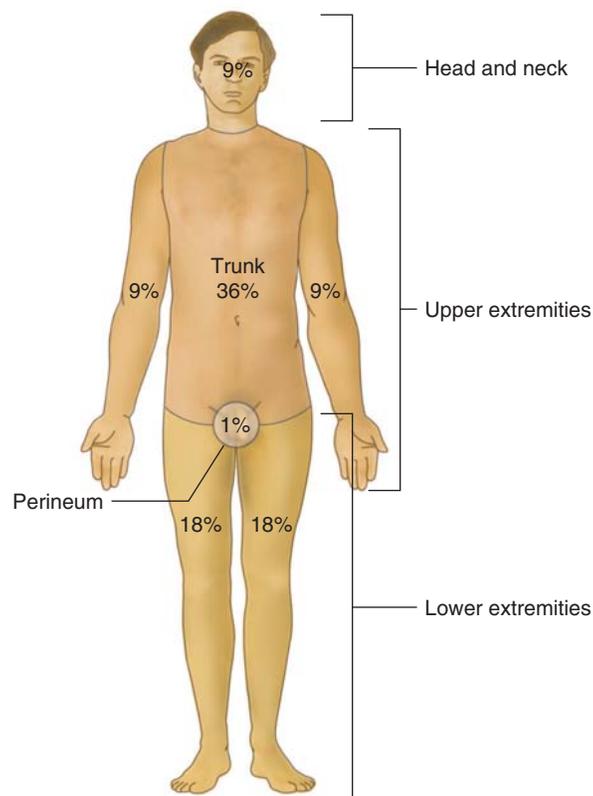
Exposure of the skin to heat, chemicals, electricity, radiation, or other irritants may cause a **burn**. Burns are classified by the amount or level of skin involvement.

The National Psoriasis Foundation (www.psoriasis.org) provides information about new treatments for psoriasis on their Web site.

1. **First-degree burns** are superficial burns of the epidermis without blistering, but with redness and swelling. Sunburn is an example of a first-degree burn. There is mild to moderate pain and the skin is intact but is often swollen and reddened, and it radiates heat. Cold compresses will relieve the pain and reduce the swelling. Various creams may help the healing process. Recovery is usually complete but continual sunburns may be a cause of later skin cancer.
2. **Second-degree burns** involve the epidermis and dermis and involve blistering. The wound is sensitive to touch and very painful.
3. **Third-degree burns** involve complete destruction of the skin, sometimes reaching into the muscle and bone and causing extensive scarring.

Figure 4-9 shows the “rule of 9s,” which is used to determine the extent of burning.

FIGURE 4-9 Burns are categorized by the extent and depth of burning.



MORE ABOUT . . .

Burns

When burning occurs, the faster treatment starts, the better the outcome. Here are some tips for the following types of burns:

- **Heat burns.** It is important to smother any flames immediately. So if your clothing is on fire, stop, drop, and roll to smother the flames.
- **Liquid scald burns.** Run cool water over the burn for 10 to 20 minutes. Do not use ice.
- **Chemical burns.** Immediately call the Poison Control Center or 911 to find out how to treat burns from a chemical.
- **Electrical burns.** Make sure the person is removed from the electrical source of the burn. If the person is not breathing, call 911 and begin CPR (discussed in Chapter 7).

Some skin conditions are caused by insects. **Pediculosis** is an inflammation with lice, often on the head (*pediculosis capitis*) or the genital area (*pediculosis pubis*). **Scabies**, a contagious skin eruption that often occurs between fingers, on other areas of the trunk, or on the male genitalia, is caused by mites.

Inflammations of the nail can be caused by infection, irritation, or fungi. **Onychia** or **onychitis** is a nail inflammation. **Paronychia** is an inflammation in the nail fold, the flap of skin overlapping the edges of the nail. Both of these inflammations often occur spontaneously in debilitated people. They may also result from a slight trauma. A general term for disease of the nails is **onychopathy**.

Some abnormal growths or **neoplasms** are benign. The most common benign neoplasms are a **callus**, a hard, thickened area of skin; a **corn**, hardening or thickening of skin on a toe; **keratosis**, overgrowth of horny tissue on skin (especially **actinic keratosis**), such as overgrowth due to excessive sun exposure; and **leukoplakia**, thickened white patches of epithelium. A growth may be of fibrous tissue: for example, a cicatrix is a growth of fibrous tissue inside a wound that forms a scar.

Some neoplasms are malignant. **Basal cell carcinoma** is cancer of the basal layer of the epidermis; **squamous cell carcinoma** affects the squamous epithelium. **Kaposi's sarcoma** is often associated with AIDS. The incidence of **malignant melanoma** is rapidly increasing. Figure 4-10 shows a benign mole and a malignant melanoma. This increase in malignant melanomas is thought to be due to the depletion of the Earth's ozone layer, which protects the skin from harmful UV rays. Many protective products, such as sunblock or sunscreen, are widely available. One of the odd results of widespread sunscreen use is that skin cancers have increased in people who use them. This is because people who use the screens actually feel that they can stay in the sun for much longer periods. The only effective skin cancer prevention is to avoid exposure to the sun as much as possible.

In most instances, hair loss is hereditary or due to a side effect of medication. However, hair loss can be a pathological condition, as in **alopecia areata**, a condition in which hair falls out in patches.



FIGURE 4-10 Scabies.

VOCABULARY REVIEW

In the previous section, you learned terms relating to pathology. Before going on to the exercises, review the terms below and refer to the previous section if you have questions. Pronunciations are provided for certain terms. Sometimes information about where the word came from is included after the term. The etymologies (word histories) are for your information only. You do not need to memorize them.

Term	Definition
abscess [ÄB-sēs] Latin <i>abscessus</i> , a going away	Localized collection of pus and other exudate, usually accompanied by swelling and redness.
acne [ÄK-nē]	Inflammatory eruption of the skin, occurring in or near sebaceous glands on the face, neck, shoulder, or upper back.
acne vulgaris [vül-GÄR-ıs]	See acne.
actinic keratosis [äk-TİN-ik KĔR-ă-tō-sıs]	Overgrowth of horny skin that forms from over-exposure to sunlight; sunburn.
albinism [ÄL-bı-nızm] albin(o) + -ism, state	Rare, congenital condition causing either partial or total lack of pigmentation.
alopecia areata [äl-ō-PĔ-shē-ă ā-rē-Ä-tă]	Loss of hair in patches.
basal cell carcinoma [BÄ-säl sĕl kăr-sın-Ō-mă]	Slow-growing cancer of the basal cells of the epidermis, usually a result of sun damage.
birthmark	Lesion (especially a hemangioma) visible at or soon after birth; nevus.
blackhead	See comedo.
bulla (pl., bullae) [BŬL-ă (BŬL-ı̄)]	Bubble-like blister on the surface of the skin.
burn	Damage to the skin caused by exposure to heat, chemicals, electricity, radiation, or other skin irritants.
callus [KÄL-üs] Latin	Mass of hard skin that forms as a cover over broken skin on certain areas of the body, especially the feet and hands.
candidiasis [kän-dı-DĪ-ă-sıs] Candid(a) + -iasis, condition	Yeastlike fungus on the skin, caused by <i>Candida</i> ; characterized by pruritus, white exudate, peeling, and easy bleeding; examples are thrush and diaper rash.
carbuncle [KÄR-bŭng-kl]	Infected area of the skin producing pus and usually accompanied by fever.
cellulitis [sĕl-yŭ-LĪ-tıs] cellul(ar) + -itis, inflammation	Severe inflammation of the dermis and subcutaneous portions of the skin, usually caused by an infection that enters the skin through an opening, as a wound; characterized by local heat, redness, pain, and swelling.

Term	Definition
cherry angioma [än-jē-Ō-mă]	A dome-shaped vascular angioma lesion that usually occurs in the elderly.
chloasma [klō-ĀZ-mă] Greek <i>chloazo</i> , to become green	Group of fairly large, pigmented facial patches, often associated with pregnancy.
cicatrix [SĪK-ă-trīks] Latin	Growth of fibrous tissue inside a wound that forms a scar; also, general term for scar.
cold sore	Eruption around the mouth or lips; herpes simplex virus Type 1.
comedo (<i>pl.</i> , comedos, comedones) [KŌM-ē-dō, kō-MĒ-dō (KŌM-ē-dōz, kō-mē-DŌ-něz)] Latin, a glutton	Open hair follicle filled with bacteria and sebum; common in acne; blackhead.
corn	Growth of hard skin, usually on the toes.
crust	Hard layer, especially one formed by dried pus, as in a scab.
cyst [sĭst] Greek <i>kystis</i> , bladder	Abnormal sac containing fluid.
decubitus (<i>pl.</i> , decubiti) [dĕ-KYŪ-bĭ-tŭs (dĕ-KYŪ-bĭ-tĭ)] ulcer	Chronic ulcer on skin over bony parts that are under constant pressure; pressure sore.
depigmentation [dĕ-pĭg-mĕn-TĀ-shŭn] de-, removal + pigmentation	Loss of color of the skin.
dermatitis [dĕr-mă-TĪ-tĭs] dermat-, skin + -itis	Inflammation of the skin.
discoid lupus erythematosus (DLE) [DĪS-kōyd LŪ-pŭs ěr-ĭ-THĚM-ă-tō-sŭs]	Mild form of lupus.
ecchymosis (<i>pl.</i> , ecchymoses) [ĕk-ĭ-MŌ-sĭs (ĕk-ĭ-MŌ-sĕz)] Greek	Purplish skin patch (bruise) caused by broken blood vessels beneath the surface.
eczema [ĔK-sĕ-mă, ĔG-zĕ-mă] Greek	Severe inflammatory condition of the skin, usually of unknown cause.
erosion	Wearing away of the surface of the skin, especially when caused by friction.
exanthematous [ĕks-zăn-THĚM-ă-tŭs] viral disease	Viral disease that causes a rash on the skin.
excoriation [ĕks-KŌ-rĕ-Ā-shŭn] Latin <i>excoriatio</i> , to skin	Injury to the surface of the skin caused by a scratch, abrasion, or burn, usually accompanied by some oozing.
fever blister	Eruption around the mouth or lips; herpes simplex virus Type 1.
first-degree burn	Least severe burn, causes injury to the surface of the skin without blistering.
fissure [FĪSH-ŭr] Latin	Deep slit in the skin.

Term	Definition
furuncle [FYŪ-rŭng-kl]	Localized skin infection, usually in a hair follicle and containing pus; boil.
gangrene [GĂNG-grĕn] Greek <i>gangraina</i> , eating sore	Death of an area of skin, usually caused by loss of blood supply to the area.
genital herpes	See herpes simplex virus Type 2.
herpes [HĒR-pĕz] Greek, shingles	An inflammatory skin disease caused by viruses of the family Herpesviridae.
herpes simplex virus Type 1	Herpes that recurs on the lips and around the area of the mouth, usually during viral illnesses or states of stress.
herpes simplex virus Type 2	Herpes that recurs on the genitalia; can be easily transmitted from one person to another through sexual contact.
herpes zoster [ZÖS-tĕr]	Painful herpes that affects nerve roots; shingles.
hives	See urticaria.
impetigo [ĭm-pĕ-TĪ-gō] Latin	A type of pyoderma.
Kaposi's sarcoma [KĂ-pō-sĕz sĂr-KŌ-mĂ] After Moritz Kaposi (1837–1902), Hungarian dermatologist	Skin cancer associated with AIDS.
keloid [KĒ-lōyd] Greek <i>kele</i> , tumor + <i>-oid</i> , like	Thick scarring of the skin that forms after an injury or surgery.
keratosis [kĕr-ă-TŌ-sĭs] <i>kerat(o)-</i> , horny layer + <i>-osis</i> , condition	Lesion on the epidermis containing keratin.
lesion [LĒ-zhŭn]	Wound, damage, or injury to the skin.
leukoderma [lŭ-kō-DĒR-mĂ] <i>leuko-</i> , white + <i>-derma</i> , skin	Absence of pigment in the skin or in an area of the skin.
leukoplakia [lŭ-kō-PLĂ-kĕ-ă] <i>leuko-</i> + <i>-plakia</i> , plaque	White patch of mucous membrane on the tongue or cheek.
macule [MĂK-yŭl]	Small, flat, noticeably colored spot on the skin.
malignant melanoma [mĕl-ă-NŌ-mĂ]	Virulent skin cancer originating in the melanocytes, usually caused by overexposure to the sun.
neoplasm [NĒ-ō-plăzm] <i>neo-</i> , recent, new + <i>-plasm</i> , formation	Abnormal tissue growth.
nevus (<i>pl.</i> , <i>nevi</i>) [NĒ-vŭs (NĒ-vĭ)]	Birthmark.
nodule [NŌD-yŭl]	Small knob of tissue.
onychchia, onychitis [ō-NĪK-ĕ-ă, ōn-ĭ-KĪ-tĭs] <i>onycho-</i> , nail + <i>-ia</i> , condition; <i>onych(o)-</i> + <i>-itis</i>	Inflammation of the nail.

Term	Definition
onychopathy [ōn-ĭ-KŎP-ă-thē] onycho- + -pathy, disease	Disease of the nail.
papule [PĂP-yū]	Small, solid elevation on the skin.
paronychia [păr-ō-NĪK-ē-ă] par(a)-, abnormal + Greek <i>onyx</i> , nail	Inflammation, with pus, of the fold surrounding the nail plate.
patch	Small area of skin differing in color from the surrounding area; plaque.
pediculated [pĕ-DĪK-yū-lā-tĕd] polyp	Polyp that projects upward from a slender stalk.
pediculosis [pĕ-DĪK-yū-LŌ-sĭs] Latin <i>pediculus</i> , louse + -osis	Lice infestation.
pemphigus [PĚM-fĭ-gŭs] Greek <i>pemphix</i> , blister	Autoimmune disease that causes skin blistering.
petechia (<i>pl.</i> , <i>petechiae</i>) [pĕ-TĒ-kĕ-ă, pĕ-TĚK-ē-ă (pĕ-TĒ-kĕ-ē)]	A tiny hemorrhage beneath the surface of the skin.
pilonidal [pĭ-lō-NĪ-dă] <i>cyst</i> pilo-, hair + Latin <i>nidus</i> , nest	Cyst containing hair, usually found at the lower end of the spinal column.
plantar [PLĂN-tăr] wart	Wart on the sole of the foot.
plaque [plăk]	See patch.
polyp [PŎL-ĭp]	Bulging mass of tissue that projects outward from the skin surface.
pressure sore	See decubitus ulcer.
pruritus [prū-RĪ-tŭs]	Itching.
psoriasis [sō-RĪ-ă-sĭs]	Chronic skin condition accompanied by scaly lesions with extreme pruritus.
purpura [PŪR-pū-ră]	Skin condition with extensive hemorrhages underneath the skin covering a wide area.
pustule [PŪS-tŭl]	Small elevation on the skin containing pus.
pyoderma [pĭ-ō-DĚR-mă] pyo-, pus + -derma, skin	Any inflammation of the skin that produces pus.
ringworm	Fungal infection; tinea.
rosacea [rō-ZĂ-shĕ-ă]	Vascular disease that causes blotchy, red patches on the skin, particularly on the nose and cheeks.
roseola [rō-ZĚ-ō-lă]	Skin eruption of small, rosy patches, usually caused by a virus.
rubella [rū-BĚL-ă]	Disease that causes a viral skin rash; German measles.
rubeola [rū-BĚ-ō-lă]	Disease that causes a viral skin rash; measles.

Term	Definition
scabies [SKĀ-bēz]	Skin eruption caused by a mite burrowing into the skin.
scale	Small plate of hard skin that falls off.
scleroderma [sklēr-ō-DĚR-mă] sclero-, hardness + -derma, skin	Thickening of the skin caused by an increase in collagen formation.
sebaceous [sě-BĀ-shūs] cyst	Cyst containing yellow sebum.
seborrhea [sěb-ō-RĚ-ă] sebo-, sebum + -rhea, flowing	Overproduction of sebum by the sebaceous glands.
second-degree burn	Moderately severe burn that affects the epidermis and dermis; usually involves blistering.
sessile [SĚS-ĭl] polyp	Polyp that projects upward from a broad base.
shingles [SHĪN-glz]	Viral disease affecting peripheral nerves and caused by herpes zoster.
squamous cell carcinoma [SKWĀ-mūs sĕl kār-sĭn-NŌ-mă]	Cancer of the squamous epithelium.
systemic lupus erythematosus (SLE)	Most severe form of lupus, involving internal organs.
telangiectasia [tĕl-ĀN-jĕ-ĕk-TĀ-zhĕ-ă]	A permanent dilation of the small blood vessels.
third-degree burn	Most severe type of burn; involves complete destruction of an area of skin.
tinea [TĪN-ĕ-ă]	Fungal infection; ringworm.
tumor [TŪ-mŏr]	Any mass of tissue; swelling.
ulcer [ŪL-sĕr]	Open lesion, usually with superficial loss of tissue.
urticaria [ŪR-tĭ-KĀR-ĕ-ă]	Group of reddish wheals, usually accompanied by pruritus and often caused by an allergy.
varicella [vār-ĭ-SĚL-ă]	Contagious skin disease, usually occurring during childhood, and often accompanied by the formation of pustules; chicken pox.
vascular [VĀS-kyū-lăr] lesion	Lesion in a blood vessel that shows through the skin.
verruca (pl., verrucae) [vĕ-RŪ-kă (vĕ-RŪ-kĕ)]	Flesh-colored growth, sometimes caused by a virus; wart.
vesicle [VĚS-ĭ-kl]	Small, raised sac on the skin containing fluid.
vitiligo [vit-ĭ-LĪ-gŏ]	Condition in which white patches appear on otherwise normally pigmented skin.
wart [wŏrt]	See verruca.
wheel [hwĕl]	Itchy patch of raised skin.
whitehead [WHĪT-hĕd]	Closed comedo that does not contain the dark bacteria present in blackheads.

CASE STUDY

Treating Adolescent Acne

Dr. Lin's new patient, Maria Cardoza, is 17 years old and has a persistent case of acne. She had been treating it with soap and Oxy-10 with limited success in the past couple of years, but recently her condition has worsened and her pediatrician recommended that she see Dr. Lin. After careful examination and removal of some comedones, Dr. Lin prescribed a course of antibiotics and asked Maria to return in three weeks. Dr. Lin put the following notes on Maria's record:

"Mild-to-moderate acne on the face, neck, and upper back. Lesions consist of macules, papules, mild oily

comedones, and an occasional nodule, but no cysts or boils. Erythromycin, 400 mg., t.i.d. for 3 months. Recheck in 3 months."

Critical Thinking

96. Dr. Lin recommended that Maria wash her face with soap three times a day. Acne occurs in the sebaceous glands. How will frequent washing help?
97. As Maria gets older, why might her acne improve even without treatment?

PATHOLOGICAL TERMS EXERCISES

Build Your Medical Vocabulary

Put C for correct in the blank next to each word that is spelled correctly. Put the correct spelling next to words that are spelled incorrectly.

98. pemfigus _____
99. varicella _____
100. purpora _____
101. urticaria _____
102. rosola _____

Add the missing suffix to the following terms.

103. Nail inflammation: onych _____
104. Skin condition: dermat _____
105. Black tumor: melan _____
106. Hair disease: tricho _____
107. White skin: leuko _____

Check Your Knowledge

Circle T for true or F for false.

108. Basal cell carcinoma is characterized by blackened areas on the skin. T F
109. All neoplasms are malignant. T F
110. A nevus is a third-degree burn. T F
111. Pruritus can be present in many skin conditions. T F
112. Rubella causes a viral skin rash. T F

113. Tinea barbae is ringworm of the feet. T F
114. Warts may be caused by a virus. T F
115. Seborrhea is abnormal pigmentation. T F
116. The herpes virus is not curable and recurs at various times. T F
117. Food allergies can cause skin eruptions. T F

Fill in the Blanks

118. Most adult hair loss is caused by _____ or _____.
119. Scabies is caused by _____.
120. Herpes simplex virus Type 1 usually occurs around the area of the _____.
121. Herpes simplex virus Type 2 usually occurs on the _____.
122. What percent of the body surface would be considered burned if only the upper extremities were involved? _____.
123. If the lower extremities, perineum, and trunk were involved, what percent of the body would this be? _____.
124. The head, neck and trunk constitute what percent of the body? _____.
125. The right leg and right arm would be _____% of the body surface.

Choose the Correct Term

Circle the term that best describes the *italicized* description in the sentences below.

126. Patient presented to the office with a *flesh-colored growth, sometimes caused by a virus* (wheal, macule, verruca) on his right index finger.
127. A *cyst containing a yellow sebum* is known as a (pilonidal, sebaceous, pustule) cyst.
128. An *area of tissue that is altered because of pathological conditions* is known as a (lesion, erosion, fissure).
129. The physician asked for your assistance in lancing a/an *localized collection of pus and other exudates* (callus, abscess, bulla) to alleviate the pressure.
130. This fungus is also known as *athlete's foot*. (tinea capitis, tinea barbae, tinea pedis)
131. A five-year-old boy was brought into the office with a viral infection commonly known as *German measles*. The medical term is (roseola, varicella, rubella).
132. The diagnosis was listed as a *chronic skin condition accompanied by scaly lesions* also known as: (psoriasis, eczema, excoriation).
133. _____ is a *condition in which white patches appear on otherwise normally pigmented skin*. (leukoderma, keratosis, vitiligo)
134. *Urticaria* is another name for (pruritus, hives, pyoderma).
135. A lesion caused by an *overgrowth of horny skin that forms due to overexposure to sunlight*; *sunburn* is called: (actinic keratosis, cellulitis, seborrheic dermatitis)

Matching Conditions and Diseases

Write the letter of the common term next to its medical term equivalent.

- | | |
|--------------------------|----------------------------|
| 136. ___verruca | a. blackhead |
| 137. ___urticaria | b. head lice |
| 138. ___ varicella | c. cold sore/fever blister |
| 139. ___herpes zoster | d. pressure sore |
| 140. ___rubeola | e. shingles |
| 141. ___ tinea | f. hives |
| 142. ___decubitus ulcer | g. birthmark |
| 143. ___nevus | h. itching |
| 144. ___rubella | i. ringworm |
| 145. ___ comedo | j. German measles |
| 146. ___ cicatrix | k. measles |
| 147. ___ pruritus | l. chickenpox |
| 148. ___herpes simplex I | m. wart |
| 149. ___pediculosis | n. scar |

Surgical Terms

Skin surgery includes the repair of various conditions. Sutures, stitches, or staples hold skin together while healing takes place. Various types of plastic surgery may involve reconstructing areas of the skin, as after severe burns or radiation. Other types of skin surgery result in the removal of a part of a growth to test for the presence of cancer. Growths are also removed to keep a cancer from spreading.

Plastic surgery is a general term for a variety of surgeries to correct defects resulting from injuries, birth defects, or to enhance someone's idea of how they should look (Figure 4-11). Surgical correction of disfiguring physical defects is also known as *cosmesis*. Plastic surgery may involve the use of **skin grafts**. An **autograft** uses skin from one's own body. An **allograft** or **homograft** uses donor skin from another person. A **heterograft** or **xenograft** uses donor skin from one species to another (such as animal, for example a pig, to human). A *dermatome* is an implement used to remove layers of skin for grafts.

Plastic surgery may also use various methods to remove unwanted growths or scrape tissue or discolorations. **Cryosurgery** involves the removal of tissue by applying cold liquid nitrogen. **Dermabrasion** is the use of brushes and emery papers to remove wrinkles, scars, and tattoos. **Debridement** and **curettage** are the removal of dead tissue from a wound by scraping.

Some surgical procedures of the skin involve the use of electricity or lasers to stop bleeding, remove tissue, or excise tissues for examination. Wounds may be **cauterized** or burned to coagulate an area that is bleeding.

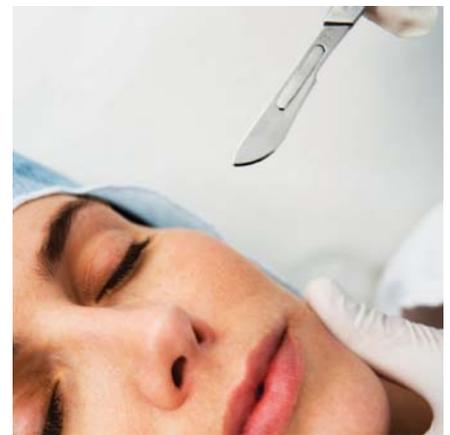


FIGURE 4-11 Some cosmetic surgeries are for minor improvements.

They may be dried with electrical current (**electrodesiccation**). **Fulguration** is the use of electric sparks to destroy tissue.

A **biopsy** is a cutting of tissue for microscopic examination. A *needle biopsy* is the removal of tissue by aspirating it through a needle. A *punch biopsy* is the use of a cylindrical instrument to remove a small piece of tissue. A *shave biopsy* is the removal of a layer of skin using a surgical blade. **Mohs' surgery** is the removal of thin layers of malignant growth until a nonmalignant area is reached.

VOCABULARY REVIEW

In the previous section, you learned terms relating to surgery. Before going on to the exercises, review the terms below and refer to the previous section if you have any questions. Pronunciations are provided for certain terms. Sometimes information about where the word came from is included after the term. The etymologies (word histories) are for your information only. You do not need to memorize them.

Term	Definition
allograft [ÄL-ō-gräft] allo-, other + graft	See homograft.
autograft [ÄW-tō-gräft] auto-, self + graft	Skin graft using skin from one's own body.
biopsy [BĪ-ōp-sē] bi(o)-, life + -opsy, view of	Excision of tissue for microscopic examination.
cauterize [KÄW-tēr-iz]	To apply heat to an area to cause coagulation and stop bleeding.
cryosurgery [KRĪ-ō-SĒR-jēr-ē] cryo-, cold + surgery	Surgery that removes tissue by freezing it with liquid nitrogen.
curettage [kyū-rĕ-TÄZH]	Removal of tissue from an area, such as a wound, by scraping.
debridement [dā-brĕd-MÖN]	Removal of dead tissue from a wound.
dermabrasion [dĕr-mă-BRĀ-zhŭn] derm-, skin + abrasion	Removal of wrinkles, scars, tattoos, and other marks by scraping with brushes or emery papers.
electrodesiccation [ē-LĒK-trō-dĕ-sĭ-KĀ-shŭn]	Drying with electrical current.
fulguration [fŭl-gŭ-RĀ-shŭn]	Destruction of tissue using electric sparks.
heterograft [HĒT-ĕr-ō-gräft] hetero-, other + graft	Skin graft using donor skin from one species to another; xenograft.
homograft [HŌ-mō-gräft] homo-, alike + graft	Skin graft using donor skin from one person to another; allograft.
Mohs' surgery [mōz] After Frederic Edward Mohs (1910–1979), U.S. surgeon.	Removal of thin layers of malignant tissue until nonmalignant tissue is found.
plastic surgery	Repair or reconstruction (as of the skin) by means of surgery.
skin graft	Placement of fresh skin over a damaged area.
xenograft [ZĒN-ō-gräft] xeno-, foreign + graft	See heterograft.

CASE STUDY

Skin Biopsy

Dr. Lin has hospital hours scheduled for tomorrow morning. He will see two patients in the one-day surgery unit for minor operations. The first patient is to have cryosurgery for removal of several moles. Later, Dr. Lin will take a biopsy from a suspicious-looking skin patch of a patient who was treated earlier for a basal cell carcinoma. The pathology report follows:

The specimen consists of two ellipses of skin, each stated to be from the left upper arm. The larger measures 1.7×0.7 cm and has a slightly raised and roughened

outer surface. Sections of skin exhibit a dermal nodular lesion consisting of interlacing bundles of elongated cells surrounded by fibrous stroma.

Critical Thinking

150. If the patch turns out to be a malignant melanoma, will that be more serious than the patient's earlier diagnosis?
151. What steps can you take to avoid permanent skin damage?

SURGICAL TERMS EXERCISES

Build Your Medical Vocabulary

Fill in the blanks in the statements that follow.

152. Tattoos can be removed through _____.
153. The repair of various conditions or the changing of one's appearance surgically is called _____ surgery.
154. Cauterizing a wound helps to stop _____.
155. The use of one's own skin to cover a wound is called a/an _____.
156. The use of someone else's skin to cover a wound is called a/an _____ or _____.

Pharmacological Terms

Treatment of skin disorders involves the use of various medications. A wide variety of topical preparations can relieve symptoms and even kill agents that cause disease. Other treatments involve heat, light, and radiation.

Cancer of the skin is sometimes successfully treated by **chemotherapy** and/or **radiation therapy**, most of the time successfully. Chemotherapy uses chemicals to treat the malignant cells systematically. Radiation therapy uses high-energy radiation to bombard malignant cells in order to destroy them.

The sun is beneficial in healing certain skin problems. Some lesions are treated with **ultraviolet light**, which imitates some of the sun's rays. On the other hand, sunlight may also be the cause of many skin problems, such as certain carcinomas.

Antihistamines are medications used to control allergic skin reactions. They do so by blocking the effects of *histamines*, chemicals present in tissues that heighten allergic reactions. Other skin conditions are controlled by different medications. For example, **antibiotics** kill or slow the growth of microorganisms on the skin. **Antiseptics** perform the same function. **Antibacterials** kill or slow the growth of bacteria. **Antifungals** kill or slow the growth of fungal infections. **Parasiticides** destroy insect parasites, such as

TABLE 4-1 Medications Used to Treat Skin Disorders

Drug Class	Purpose	Generic Name	Trade Name
anesthetic	to relieve pain	benzocaine dibucaine lidocaine	Anbesol, Orajel, Solarcaine Nupercainal Lidoderm
antifungal	to slow stop fungi growth	tolnaftate clotrimazole ketoconazole	Absorbine, Desenex, Tinactin Lotrimin Nizoral
antihistamine	to slow, stop, or prevent an allergic reaction	diphenhydramine loratidine fexofenadine	Allerdryl, Benadryl, Caladryl Claritin Allegra
antibacterial	to slow or stop the growth of bacteria	neomycin bacitracin benzoyl peroxide	Myciguent Neosporin Clearasil
antipruritic	to relieve itching	hydrocortisone doxapin	Bactine, Caldecort, Cortaid, Hydrocortone Zonalon
anti-inflammatory (corticosteroid)	to reduce inflammation	triamcinolone betamethasone	Aristocort, Triamolone, Tri-Kort, Kenacort A 10 Diprosone, Betnovate

lice and mites, that cause some skin conditions. **Anti-inflammatory** agents, particularly **corticosteroids**, reduce inflammation, and **antipruritics** control itching. Some skin conditions are painful because of nerve conduction near the skin surface. An **anesthetic** (especially, in the case of surface pain, a **topical anesthetic**) can relieve some of the pain associated with such conditions.

Some skin conditions result in either oversecretion of oils or extreme dryness. **Emollients** are agents that soothe or soften skin by moistening it or adding oils to it. **Astringents** temporarily lessen the formation of oily material on the surface of the skin. These types of agents are often present in over-the-counter products. Other vitamin-based products to control skin aging (often containing Vitamins A and C) are also often available over the counter. **Keratolytics** remove warts and corns from the skin surface. **Alpha-hydroxy acids** are fruit acids added to cosmetics to improve the skin's appearance. Table 4-1 lists drugs commonly used in treating skin conditions.

VOCABULARY REVIEW

In the previous section, you learned terms relating to pharmacology. Before going on to the exercises, review the terms below and refer to the previous section if you have questions. Pronunciations are provided for certain terms. Sometimes information about where the word came from is included after the term. The etymologies (word histories) are for your information only. You do not need to memorize them.

Term	Definition
alpha-hydroxy [ÄL-fă-hī-DRÖK-sē] acid	Agent added to cosmetics to improve the skin's appearance.
anesthetic [än-ēs-THĒT-ĭk] Greek <i>anaesthesia</i> , without sensation	Agent that relieves pain by blocking nerve sensations.
antibacterial [ÄN-tē-băk-TĒR-ē-ăl] anti-, against + bacteria	Agent that kills or slows the growth of bacteria.
antibiotic [ÄN-tē-bī-ÖT-ĭk] anti-, against + Greek <i>biosis</i> , life	Agent that kills or slows the growth of microorganisms.
antifungal [ÄN-tē-FÜNG-ăl] anti-, against + fungal	Agent that kills or slows the growth of fungi.
antihistamine [ÄN-tē-HĪS-tă-mēn] anti-, against + histamine	Agent that controls allergic reactions by blocking the effectiveness of histamines in the body.
anti-inflammatory	Agent that relieves the symptoms of inflammations.
antipruritic [ÄN-tē-prū-RĪT-ĭk] anti-, against + pruritic, relating to pruritus	Agent that controls itching.
antiseptic	Agent that kills or slows the growth of microorganisms.
astringent [äs-TRĪN-jĕnt]	Agent that removes excess oils and impurities from the surface of skin.
chemotherapy [KĒ-mō-THĀR-ă-pē] chemo-, chemistry + therapy	Treatment of cancer that uses chemicals to destroy malignant cells.
corticosteroid [KÖR-tĭ-kō-STĒR-ōyd] cortico-, adrenal cortex + steroid	Agent with anti-inflammatory properties.
emollient [ē-MÖL-ē-ĕnt]	Agent that smooths or softens skin.
keratolytic [KĒR-ă-tō-LĪT-ĭk] kerato- + -lytic	Agent that aids in the removal of warts and corns.
parasiticide [păr-ă-SĪT-ĭ-sĭd] parasit(e) + -cide, killing	Agent that kills or slows the growth of parasites.
radiation therapy	Treatment of cancer that uses ionizing radiation to destroy malignant cells.
topical anesthetic	Anesthetic applied to the surface of the skin.
ultraviolet light [ül-tră-VĪ-ō-lĕt]	Artificial sunlight used to treat some skin lesions.

CASE STUDY

Providing Relief

Dr. Lin has several patients in their mid-fifties who are concerned about dry skin, age spots, and wrinkling. One patient has dry skin with severe pruritus. Her skin is extremely rough in spots. Dr. Lin suggests that there may be a hormonal cause, since the patient is in menopause and since the production of hormones decreases during and after menopause. He refers her to her gynecologist.

Meanwhile, he prescribes something to control the pruritus. Another patient is a young child with an allergic rash. The doctor writes the following prescriptions.

Critical Thinking

157. Prescription A is for which patient?
158. Prescription B is for what condition?

Dr. A. Lin 145 West 20th Street • Chicago, IL 55555 • (999)111-2222	
PATIENT'S NAME <i>Michele Cortez</i>	AGE <i>53</i>
ADDRESS _____	
CITY _____	DATE <i>9/1/XX</i>
℞	
<i>Hydrocortisone ointment 0.5%, apply to affected area, q.i.d. for 2 wks.</i>	
LICENSE NO. 555	<i>A. Lin, M.D.</i> SIGNATURE

A

Dr. A. Lin 145 West 20th Street • Chicago, IL 55555 • (999)111-2222	
PATIENT'S NAME <i>Chester Banks</i>	AGE <i>6</i>
ADDRESS _____	
CITY _____	DATE <i>9/1/XX</i>
℞	
<i>Diphenhydramine lotion 1%, apply to affected area, b.i.d. for 1 wk.</i>	
LICENSE NO. 555	<i>A. Lin, M.D.</i> SIGNATURE

B

PHARMACOLOGICAL TERMS EXERCISES

Build Your Medical Vocabulary

Find and define at least one word part in each of the following words.

159. antiseptic: _____
160. antipruritic: _____
161. chemotherapy: _____
162. fungicide: _____
163. mycocide: _____
164. keratolysis: _____

Check Your Knowledge

Circle T for true or F for false.

165. Chemotherapy is the use of radiation to treat cancer. T F
166. Antibiotics are used to treat acne. T F

167. Histamines are always present in the body. T F
168. Astringents control pruritus. T F
169. Emollients can contain oils. T F

Match the Trade Names

Place the letter of the trade name of the medication that best represents the drug class to the left in the blank and then state the drug's purpose in the blank after the drug class.

- a. Aristocort
- b. Neosporin
- c. Anbesol
- d. Lotrimin
- e. Benadryl
- f. Cortaid

- _____ 170. antipruritic: _____
- _____ 171. anti-inflammatory: _____
- _____ 172. antifungal: _____
- _____ 173. antibacterial: _____
- _____ 174. antihistamine: _____
- _____ 175. anesthetic: _____

CHALLENGE SECTION

Dr. Lin has a patient with diabetes. Notes on the patient's record are as follows:

"Patient is a 48-year-old female with a history of diabetes. Patient notices localized edema on lower aspect of leg. Area is very red and feels hot to the touch. The skin has the dimpled appearance (*peau d'orange*) of the outside of an orange, and appears 'stretched.' Patient has fever, chills, and headache. Also, patient feels fatigued."

Dr. Lin orders a CBC that shows an elevated WBC, indicating a bacterial infection. No pus has formed in the area. There is an indication of swollen lymph nodes. Treatment includes antibiotic (penicillin V 250 mg. q.i.d. for 10–14 days), bed rest, and elevation of infected area with warm, moist compresses 6x daily.

Critical Thinking

176. The patient has a diagnosis of cellulitis. What does that mean? Is it potentially dangerous if untreated?
177. What could happen if the patient feels better and stops the antibiotic early?

TERMINOLOGY IN ACTION

The letter shown below is a referral from a general practitioner to a dermatologist's office. As a learning exercise, define from memory the terms from the integumentary system that you find in the letter.

*Dr. Alicia Williams
45 Essex Street
Anywhere, TX 99999*

Dear Dr. Williams:

In the near future, you will be seeing a patient of mine, Lee Hong. He has been seen by me several times for treatment of verruca on his hands. They have been resistant to liquid nitrogen treatment.

On examination of his hands, there is an approximate 3-mm growth over the dorsum of the index finger and a small lesion on the thumb of his right hand. In addition, I noticed a change in a mole on his left thigh. Please check this mole.

Thank you for assisting in the care of this patient.

Sincerely,

Alicia Williams

Alicia Williams, MD

USING THE INTERNET

Go to the National Cancer Institute's Web site for skin cancer (<http://www.nci.nih.gov/cancerinfo/types/skin>). Find two treatments for skin cancer that are presently being used. Discuss one research article on skin cancer presented at the site. Next, locate the Web site of the American Society for Dermatologic Surgery <http://asds-net.org/>. Find the Glossary of Terms for the most frequent dermasurgical conditions and their treatments. Discuss each one for an understanding of the benefits and precautions that must be addressed as a health care professional with patients.

CHAPTER REVIEW

True or False

Circle T for true or F for false. If the answer is false, write the correct answer in the space provided.

178. Another name for a boil is a bulla. T F _____
179. Herpes simplex virus Type 2 is a painful condition that affects the nerve root. T F _____
180. Rosacea is a vascular disease that causes blotchy, red patches on the skin. T F _____
181. A wart that is found on the bottom of the foot is known as a plantar wart. T F _____
182. Any inflammation of the skin that causes pus is called a pachyderma. T F _____
183. A tiny hemorrhage beneath the surface of the skin is called a microdermorrhagia. T F _____
184. A first-degree burn involved complete destruction of an area of skin. T F _____
185. A whitehead and a blackhead are both called comedos; one is open and one is closed. T F _____
186. An overgrowth of scar tissue is known as a keloid. T F _____
187. Secondary lesions result from changes in vascular lesions. T F _____
188. Another name for hair that falls out in patches is alopecia areata. T F _____
189. With the widespread use of sunscreens the incidence of skin cancers has decreased. T F _____
190. Inflammation of the dermis and subcutaneous skin layers is called cellulitis. T F _____
191. DLE is a mild form of lupus that usually causes only superficial eruption of the skin. T F _____
192. The subcutaneous layer is the layer between the dermis and the body's inner organs. T F _____
193. A Mantoux test is given to test for diphtheria. T F _____
194. Dead skin is removed by exfoliation or diaphoresis. T F _____
195. Hair growth, thickness, and curliness are generally determined by heredity. T F _____
196. When collagen fibers stretch they form fissures. T F _____
197. Chloasma are pigmented patches that appear on the face, often associated with pregnancy. T F _____

Pluralizing Terms

Give the plural form for each of the integumentary terms below. Consult Table 1-2 in Chapter 1 if you need assistance with this exercise.

198. fungus _____
199. abscess _____
200. ecchymosis _____
201. nevus _____
202. bulla _____
203. verruca _____
204. staphylococcus _____
205. comedo _____

DEFINITIONS

Define the following terms and combining forms. Review the chapter before starting, and check your answers by looking in the vocabulary reviews in this chapter. Make sure you know how to pronounce each term. The words in curly brackets are references to the Spanish glossary available online at www.mhhe.com/medterm3e.

TERM

- | | | |
|---|--|---|
| 206. abscess [ÄB-sës] {absceso} | 228. basal cell carcinoma [BÄ-säl sël kär-sin-Ö-mä] | 249. corticosteroid [KÖR-ti-kö-STËR-öyd] |
| 207. acne [ÄK-në] {acné} | 229. biopsy [BĪ-öp-së] {biopsia} | 250. crust {costar} |
| 208. acne vulgaris [vül-GÄR-ís] {acné vulgar} | 230. birthmark | 251. cryosurgery [KRĪ-ö-SËR-jër-ë] {criocirugía} |
| 209. actinic keratosis [äk-TĪN-ik kär-ä-TÖ-sis] | 231. blackhead {punto Negro} | 252. curettage [kyü-rë-TÄZH] |
| 210. adip(o) | 232. bulla (pl., bullae) [BÜL-ä (BÜL-i)] {bulla} | 253. cuticle [KYÜ-ti-kl] {cutícula} |
| 211. adipose [ÄD-i-pös] {adiposo} | 233. burn {quemadura} | 254. cyst [sist] {quiste} |
| 212. allograft [ÄL-ö-gräft] {aloinjerto} | 234. callus [KÄL-üs] {callo} | 255. debridement [dä-brëd-MÖN] |
| 213. albinism [ÄL-bi-nizm] {albinismo} | 235. candidiasis [kän-dĭ-DĪ-ä-sis] {candidiasis} | 256. decubitus (pl., decubiti) [dë-KYÜ-bi-tüs (dë-KYÜ-bi-ti)] ulcer |
| 214. alopecia [äl-ö-PË-shë-ä] {alopecia} | 236. carbuncle [KÄR-büng-kl] {carbunco} | 257. depigmentation [dë-pig-mën-TÄ-shün] |
| 215. alopecia areata [äl-ö-PË-shë-ä ä-rë-Ä-tä] | 237. cauterize [KÄW-tër-iz] {cauterizar} | 258. dermabrasion [dër-mä-BRÄ-zhün] {dermabrasión} |
| 216. alpha-hydroxy [ÄL-fä-hi-DRÖK-së] acid | 238. cellulitis [sël-yü-LĪ-tis] {celulitis} | 259. dermatitis [dër-mä-TĪ-tis] {dermatitis} |
| 217. anesthetic [än-ës-THËT-ik] | 239. ceruminous [së-RÜ-mĭn-üs] glands | 260. dermat(o) |
| 218. antibacterial [ÄN-të-bäk-TËR-ë-äl] | 240. chemotherapy [KË-mö-THÄR-ä-pë] | 261. dermatology [dër-mä-TÖL-ö-jë] {dermatología} |
| 219. antibiotic [ÄN-të-bi-ÖT-ik] | 241. cherry angioma [än-jë-Ö-mä] | 262. dermis [DËR-mis] {dermis} |
| 220. antifungal [ÄN-të-FÜNG-äl] | 242. chloasma [klö-ÄZ-mä] {cloasma} | 263. derm(o) |
| 221. antihistamine [ÄN-të-HĪS-tä-mën] | 243. cicatrix [SĪK-ä-triks] {cicatriz} | 264. diaphoresis [DĪ-ä-fö-RË-sis] {diaforesis} |
| 222. anti-inflammatory | 244. cold sore | 265. discoid lupus erythematosus (DLE) [DĪS-köyd LÜ-püs ër-i-THËM-ä-tö-sis] |
| 223. antipruritic [ÄN-të-prü-RĪT-ik] | 245. collagen [KÖL-lä-jën] {colágeno} | 266. ecchymosis (pl., ecchymoses) [ëk-i-MÖ-sis (ëk-i-MÖ-sëz)] {equimosis} |
| 224. antiseptic | 246. comedo (pl., comedos, comedones) [KÖM-ë-dö, kö-MË-dö (KÖM-ë-döz, kö-më-DÖ-nëz)] | 267. eccrine [ËK-rin] glands {glándulas ecrinas} |
| 225. apocrine [ÄP-ö-krin] glands | 247. corium [KÖ-rë-üm] {corium} | 268. eczema [ËK-së-mä, ËG-zë-mä] {eccema} |
| 226. astringent [äs-TRĪN-jënt] | 248. corn {callo} | |
| 227. autograft [ÄW-tö-gräft] {autoinjerto} | | |

TERM

269. electrodesiccation [ĕ-LĚK-trō-dĕ-sĭ-KĀ-shŭn]
270. emollient [ĕ-MŎL-ĕ-ĕnt]
271. epidermis [ĕp-ĭ-DĚR-mĭs] {epidermis}
272. erosion {erosion}
273. exanthematous [ĕks-zĕn-THĚM-ĕ-tŭs] viral disease
274. excoriation [ĕks-KŎ-rĕ-Ā-shŭn] {excoriación}
275. exocrine [ĚK-sŏ-krĭn] glands
276. exudate [ĚKS-yŭ-dĕt] {exudado}
277. fever blister
278. first-degree burn
279. fissure [FĪSH-ŭr] {fisura}
280. fulguration [fŭl-gŭ-RĀ-shŭn] {fulguraciŏn}
281. furuncle [FYŪ-rŭng-kl] {furŭnculo}
282. gangrene [GĀNG-grĕn] {gangrena}
283. genital herpes
284. hair follicle [FŎL-ĭ-kl]
285. hair root {raiz del pelo}
286. hair shaft
287. herpes [HĚR-pĕz] {herpes}
288. herpes simplex virus Type 1
289. herpes simplex virus Type 2
290. herpes zoster [ZŎS-tĕr]
291. heterograft [HĚT-ĕr-ŏ-grĕft] {heteroinjerto}
292. hidr(o)
293. hives {urticaria}
294. homograft [HŎ-mŏ-grĕft] {homoinjerto}
295. hypodermis [hĭ-pŏ-DĚR-mĭs] {hipodermis}
296. ichthy(o)
297. impetigo [ĭm-pĕ-TĪ-gŏ] {impĕtigo}
298. integument [ĭn-TĚG-yŭ-mĕnt] {integumento}
299. intradermal [ĭn-trĕ-DĚR-mĕl] {intradĕrmico}
300. Kaposi's sarcoma [KĀ-pŏ-sĕz sĕr-KŎ-mĕ]
301. keloid [KĚ-lŏyd] {queloide}
302. keratin [KĚR-ĕ-tĭn] {queratina}
303. kerat(o)
304. keratolytic [KĚR-ĕ-tŏ-LĪT-ĭk]
305. keratosis [kĕr-ĕ-TŎ-sĭs] {queratosis}
306. lesion [LĚ-zhŭn] {lesiŏn}
307. leukoderma [lŭ-kŏ-DĚR-mĕ] {leucodermia}
308. leukoplakia [lŭ-kŏ-PLĀ-kĕ-ĕ] {leucoplaquia}
309. lip(o)
310. lunula (pl., lunulae) [LŪ-nŭ-lĕ (LŪ-nŭ-lĕ)] {lŭnula}
311. macule [MĀK-yŭl] {macula}
312. malignant melanoma [mĕl-ĕ-NŎ-mĕ]
313. Mantoux [mĕn-TŪ] test
314. melan(o)
315. melanin [MĚL-ĕ-nĭn] {melanina}
316. melanocyte [MĚL-ĕ-nŏ-sĭt] {melanocito}
317. Mohs' [mŏz] surgery
318. myc(o)
319. nail {uña}
320. neoplasm [NĚ-ŏ-plĕzm] {neoplasma}
321. nevus (pl., nevi) [NĚ-vŭs (NĚ-vĭ)] {nevo}
322. nodule [NŎD-yŭl] {nŏdulo}
323. onych(o)
324. onychia, onychitis [ŏ-NĪK-ĕ-ĕ, ŏn-ĭ-KĪ-tĭs] {oniquia}
325. onychopathy [ŏn-ĭ-KŎP-ĕ-thĕ] {onicopatĭa}
326. papillary [PĀP-ĭ-lĕr-ĕ] layer
327. papule [PĀP-yŭl] {pĕpula}
328. parasiticide [pĕr-ĕ-SĪT-ĭ-sĭd]
329. paronychia [pĕr-ŏ-NĪK-ĕ-ĕ] {paroniquia}
330. patch {placa}
331. patch test
332. pediculated [pĕ-DĪK-yŭ-lĕ-tĕd] polyp
333. pediculosis [pĕ-DĪK-yŭ-LŎ-sĭs] {pediculosis}
334. pemphigus [PĚM-fĭ-gŭs] {pĕnfigo}
335. petechia (pl., petechiae) [pĕ-TĚ-kĕ-ĕ, (pĕ-TĚ-kĕ-ĕ)] {petequia}
336. pil(o)
337. pilonidal [pĭ-lŏ-NĪ-dĕl] cyst
338. plantar [PLĀN-tĕr] wart
339. plaque [plĕk] {placa}
340. plastic surgery
341. polyp [PŎL-ĭp] {pŏlipo}
342. pore {poro}
343. pressure sore
344. pruritus [prŭ-RĪ-tŭs] {prurita}
345. psoriasis [sŏ-RĪ-ĕ-sĭs] {psoriasis}
346. purpura [PŪR-pŭ-rĕ] {pŭrpura}
347. pustule [PŪS-tŭl] {pŭstula}
348. pyoderma [pĭ-ŏ-DĚR-mĕ] {piodermĭa}

TERM

349. radiation therapy
350. reticular [rě-TĪK-yū-lār] layer
351. ringworm {**tiña**}
352. rosacea [rō-ZĀ-shē-ă]
{**rosácea**}
353. roseola [rō-ZĒ-ō-lā]
354. rubella [rū-BĚL-ă] {**rubéola**}
355. rubeola [rū-BĚ-ō-lā] {**rubéola**}
356. scabies [SKĀ-bēz] {**sarna**}
357. scale {**escala**}
358. Schick [shĭk] test
359. scleroderma [sklēr-ō-DĚR-mă]
{**esclerodermia**}
360. scratch test
361. sebaceous [sě-BĀ-shūs] cyst
362. sebaceous glands
363. seb(o)
364. seborrhea [sěb-ō-RĚ-ă]
{**seborrea**}
365. sebum [SĚ-bŭm] {**sebo**}
366. second-degree burn
367. sessile [SĚS-ĭl] polyp
368. shingles [SHĪN-glz]
{**culebrilla**}
369. skin graft {**injerto de la piel**}
370. squamous cell carcinoma
[SKWĀ-mŭs sĕl
kār-sĭn-NŌ-mă]
371. squamous epithelium
[ĕp-ĭ-THĚ-lē-ŭm]
372. steat(o)
373. stratified squamous epithelium
374. stratum (*pl.*, strata) [STRĀT-
ŭm (STRĀ-tă)] {**estrato**}
375. stratum corneum
[KŌR-nē-ŭm]
376. stratum germinativum
[jĕr-mĭ-NĀT-ĭ-vŭm]
377. striae [STRĪ-ē] {**estrías**}
378. subcutaneous [sŭb-kyū-TĀ-
nē-ŭs] layer
379. sweat glands
380. systemic lupus erythematosus
(SLE)
381. telangiectasia
[tĕl-ĀN-jĕ-ĕk-TĀ-zhē-ă]
382. third-degree burn
383. tine [tĭn] **test, TB tine**
384. tinea [TĪN-ē-ă] {**tiña**}
385. topical anesthetic
386. trich(o)
387. tumor [TŪ-mŏr] {**tumor**}
388. ulcer [ŪL-sĕr] {**úlcerá**}
389. ultraviolet [ŭl-tră-VĪ-ō-lĕt]
light
390. urticaria [ŪR-tĭ-KĀR-ē-ă]
{**urticaria**}
391. varicella [văr-ĭ-SĚL-ă]
{**varicela**}
392. vascular [VĀS-kyū-lār] lesion
393. verruca (*pl.*, verrucae) [vĕ-
RŪ-kă (vĕ-RŪ-kĕ)] {**verruĝa**}
394. vesicle [VĚS-ĭ-kl] {**vesícula**}
395. vitiligo [vĭt-ĭ-LĪ-gŏ] {**vitiligo**}
396. wart [wŏrt] {**verruĝa**}
397. wheal [hwĕl] {**roncha**}
398. whitehead [WHĪT-hĕd]
{**punto blanco**}
399. xanth(o)
400. xenograft [ZĚN-ō-grăft]
{**xenoinjerto**}
401. xer(o)

Abbreviations

Write the full meaning of each abbreviation.

ABBREVIATION

402. bx
403. DLE
404. PPD
405. PUVA
406. SLE

Name _____ Date _____

Chapter 4: Word-Building (20 questions - 1 pts. each)

Using the following combining forms, complete the word that best fits the definition of each word relating to the integumentary system listed below. Combining forms may be used more than once.

adip(o)	ichthy(o)	myc(o)	steat(o)
dermat(o)	kerat(o)	onych(o)	trich(o)
derm(o)	lip(o)	pil(o)	xanth(o)
hidr(o)	melan(o)	seb(o)	xer(o)

1. Skin contraction: _____ stenosis
2. Study of fungi: _____ logy
3. Abnormal nail softness: _____ malacia
4. Skin hemorrhage: _____ rrhea
5. Deficiency of fats: _____ penia
6. Inflammation of fatty tissue: _____ itis
7. Yellowish skin: _____ derma
8. Fat cell: _____ cyte
9. Marbled skin: _____ leukoderma
10. Dry skin: _____ osis
11. Formation of a horny layer: _____ plasia
12. Nail biting: _____ phagia
13. Scraping procedure used on the skin: _____ abrasion
14. Excessive lip dryness: _____ chilia
15. Fish-shaped: _____ oid
16. Yellow skin nodule: _____ oma
17. Hair examination: _____ scopy
18. Overactivity of the sebaceous glands: _____ rrhea
19. Fungal condition: _____ osis
20. Scaling of the skin: _____ osis