

# CHAPTER Nursing Care 16 of Clients with Integumentary Disorders

## LEARNING OUTCOMES

- Describe the manifestations and nursing care of common skin problems and lesions.
- Compare and contrast the etiology, pathophysiology, interdisciplinary care, and nursing care of clients with infections and infestations, inflammatory disorders, and malignancies of the skin.
- Explain the risk factors for, pathophysiology of, and nursing interventions to prevent and care for pressure ulcers.
- Discuss surgical options for excision of neoplasms, reconstruction of facial or body structures, and cosmetic procedures.
- Explain the pathophysiology of selected disorders of the hair and nails.
- Discuss the effects and nursing implications of medications and treatments used to treat disorders of the integument.

## CLINICAL COMPETENCIES

- Assess functional health status of clients with integumentary disorders, and monitor, document, and report abnormal manifestations.
- Use evidence-based research to plan and implement nursing care for clients with pressure ulcers.
- Determine priority nursing diagnoses, based on assessed data, to select and implement individualized nursing interventions for clients with integumentary disorders.
- Administer topical, oral, and injectable medications used to treat integumentary disorders knowledgeably and safely.
- Integrate interdisciplinary care into care of clients with integumentary disorders.
- Provide teaching appropriate for prevention and self-care of disorders of the integumentary system.
- Revise plan of care as needed to provide effective interventions to promote, maintain, or restore functional health status to clients with disorders of the integument.

### MEDIA LINK



Resources for this chapter can be found on the Prentice Hall Nursing MediaLink DVD-ROM accompanying this textbook, and on the Companion Website at <http://www.prenhall.com/lemone>



## KEY TERMS

<b>acne</b> , 457	<b>folliculitis</b> , 446	<b>pemphigus vulgaris</b> , 460
<b>actinic keratosis</b> , 461	<b>frostbite</b> , 476	<b>pressure ulcer</b> , 472
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The skin and its accessory structures (the integumentary system) enclose and cover the body, providing protection by serving as a barrier between the internal and external environments. As described in Chapter 15 ∞, the skin contains receptors for touch and sensation, helps regulate body temperature, and maintains fluid and electrolyte balance. The skin also provides cues to racial and ethnic background, and plays a major role in determining self-concept, roles, and relationships.

There are many disorders of the integument. Many of them are treated in an outpatient setting or by self-care. This chapter discusses disorders of the skin, hair, and nails; Chapter 17 ∞ discusses the client with burns. Primary and secondary skin lesions are described and illustrated in Tables 15–5 and 15–6. The terms from these tables are used throughout this and the next chapter.

## COMMON SKIN PROBLEMS AND LESIONS

The disorders discussed in this section are those experienced by a large number of people. Although they are considered minor health problems in terms of health care, they may cause major problems for the person experiencing a high level of discomfort and/or chronicity.

### THE CLIENT WITH PRURITUS

**Pruritus** is a subjective itching sensation that produces an urge to scratch. Pruritus may occur in a small, circumscribed area, or it may involve a widespread area; it may or may not be associated with a rash. Pruritus is believed to result from either stimulation of itch receptors in the skin or as a response to the stimulation of skin receptors for pain and touch. The central nervous system (CNS) interprets these stimuli as an itch through central summation (Porth, 2005).

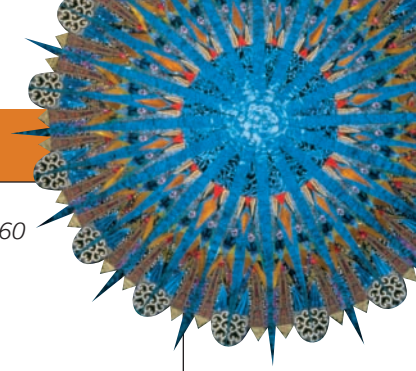
Almost anything in the internal or external environment can cause pruritus. Insects, animals, plants, fabrics, metals, medications, allergies, and even emotional distress are among the most common causes. Pruritus also may occur as a secondary manifestation of systemic disorders, such as certain types of cancer, diabetes mellitus, hepatic disease, and renal failure. Although the exact physiology is unknown, it is known that heat and prostaglandins trigger pruritus and that histamine and morphine increase it.

The pathophysiologic response of pruritus to stimulation or irritation follows a similar pathway, regardless of cause. The irritating agent stimulates receptors in the junction between the epidermis and dermis, and may also trigger the release of his-

tamine and other chemical mediators that either further stimulate or mediate the itch response. The response of the person experiencing the itch is to scratch or rub the affected area. This may irritate the skin and cause further inflammation, which in turn sets off a cycle of increasingly intense itching and scratching, called the *itch-scratch-itch cycle*.

Secondary effects of pruritus include skin excoriation, erythema (redness), wheals, changes in pigmentation, and infections. Persistent pruritus may interrupt sleep patterns, because the itching sensation is often more intense at night. Long-term pruritus may be debilitating and increases the risk of infection as excoriation occurs.

Management of pruritus focuses on identifying and eliminating the cause and providing medications to relieve the itch. Antihistamines may relieve pruritus in some clients. Tranquilizers provide sedation, which may in turn relieve the emotional stress associated with pruritus; however, eliminating the stressors produces a more successful result. Systemic antibiotics are used to treat the infection resulting from the scratching and excoriation. Topical medications that contain corticosteroids are often used to relieve the pruritus and inflammation. Topical medications may also be administered through therapeutic baths or soaks with agents that relieve pruritus, such as cornstarch and baking soda or coal tar concentrates. Creams containing a topical anesthetic or antibiotic may also be used. Therapeutic baths are discussed in the Medication Administration box on the following page. Table 16–1 lists examples of topical agents used to treat skin disorders.



**MEDICATION ADMINISTRATION Therapeutic Baths**

**AGENTS USED IN THERAPEUTIC BATHS**

**Saline or tap water**

**Antibacterial agents: potassium permanganate, acetic acid, hexachlorophene**

**Colloid substances: oatmeal (Aveeno), cornstarch, sodium bicarbonate**

**Coal tar derivatives: Balnetar, Zetar, Polytar**

**Emollients: Alpha Keri, Lubath, mineral oil.**

Therapeutic baths have a variety of uses in treating skin disorders. Depending on the agent used, therapeutic baths soothe the skin, lower the skin bacteria count, clean and hydrate the skin, loosen scales, and relieve itching.

**Nursing Responsibilities**

- Ensure that the bath water is at a comfortable temperature that is neither too hot nor too cool, usually 110° to 115°F (45° to 46°C).
- Fill the tub one-third to one-half full.
- Mix the agent well with the water.

- Assist the client into and out of the tub to prevent falls.
- Dry the client by blotting with the towel.

**Health Education for the Client and Family**

- Use a bath mat in the tub, because the medications may cause the tub to become slippery.
- Keep the bathroom warm but adequately ventilated.
- Follow directions carefully for the amount of medication to use in the bath.
- Fill the bath one-third to one-half full of water that is at a comfortable temperature.
- Stay in the bath for 20 to 30 minutes, and immerse the areas to be treated.
- Do not get the bathwater in your eyes.
- Dry by blotting (not rubbing) with the towel.
- If the medications cause staining, use old towels or linens.
- If the itching is not relieved or the skin becomes excessively dry, call your healthcare provider.

## THE CLIENT WITH DRY SKIN (XEROSIS)

Dry skin, also called **xerosis**, is most often a problem in the older adult. Xerosis commonly results, especially in the older adult, from a decrease in the activity of sebaceous and sweat glands, which reduces the skin's lubrication and moisture retention. However, dry skin may occur at any age from exposure to environmental heat and low humidity, sunlight, excessive bathing, and a decreased intake of liquids.

Two types of severe dry skin are xeroderma and ichthyosis. Xeroderma is a chronic skin condition characterized by dry, rough skin. Ichthyosis is an inherited dermatologic condition in

which the skin is dry, fissured, and hyperkeratotic; the surface of the skin has the appearance of fish scales.

The primary manifestation of dry skin is pruritus. Other manifestations include visible flaking of surface skin and an observable pattern of fine lines over the area. If the skin has been excessively dry and pruritic for a long period, the client may have secondary skin lesions and lichenification (thickening).

Nursing care focuses on teaching the client and family how to reduce the dry skin and relieve the pruritus, as outlined in Box 16–1.

**TABLE 16–1 Medications Used to Treat Skin Disorders**

TYPE	USE	EXAMPLES
Creams	Moisturize the skin	Aquacare Curel Nutraderm
Ointments	Lubricate the skin Retard water loss	Aquaphor Vaseline
Lotions	Moisturize the skin Lubricate the skin	Alpha-Keri Dermassage LubriDerm
Anesthetics	Relieve itching	Xylocaine
Antibiotics	Treat infection	Bacitracin Polysporin Gentamicin Silvadene
Corticosteroids	Suppress inflammation Relieve itching	Dexamethasone Hydrocortisone Clocortolone Desonide

### BOX 16–1 Teaching to Reduce Dry Skin and Relieve Pruritus

- Wash clothing in a mild detergent and rinse twice; do not use fabric softeners.
- Avoid using perfumes and lotions containing alcohol.
- Apply skin lubricants after a bath to help retain moisture.
- Soaps and hot water are drying. Clean the skin with tepid water and either a mild soap or cleansing creams. If soap is used, rinse it off carefully.
- It is not necessary to take a bath every day.
- If bath oils are used, add them to the bathwater at the end of the bath (the moist skin is more likely to retain the oil). Use care not to slip in the tub.
- Use a humidifier to humidify the air.
- Apply creams and lotions when the skin is slightly damp after bathing.
- Increase fluid intake.
- Keep nails trimmed short, wear loose clothing, and keep the environment cool.
- A brief application of pressure or cold may relieve pruritus.
- Cotton gloves may be worn at night if scratching during sleep causes skin excoriation.
- Distraction or relaxation techniques may prove helpful.



## THE CLIENT WITH BENIGN SKIN LESIONS

The skin is subject to many different types and kinds of benign skin lesions, including cysts, keloids, nevi, angiomas, skin tags, and keratoses. Although these benign lesions are often considered more of a nuisance than an illness, they do require monitoring for an increase in size that interferes with the skin's appearance or function.

Most benign skin lesions do not require treatment, although excision or laser surgery may sometimes be desired or necessary. Cysts may enlarge, skin tags may become irritated and bleed, nevi may change in appearance, or any of the lesions may cause discomfort with appearance.

### Cysts

**Cysts** of the skin are benign closed sacs in or under the skin surface that are lined with epithelium and contain fluid or a semi-solid material. Epidermal inclusion cysts and pilar cysts are the most common types.

Epidermal inclusion cysts may occur anywhere on the body but are most often found on the head and trunk. Although they are painless, they may grow so large that they become irritated by contact with clothing (e.g., if located on the back of the neck) or cause obstruction (e.g., if located on the nose). The cysts contain a semisolid material composed mainly of keratin. Pilar cysts are found on the scalp and originate from sebaceous glands. They are also painless. Both types of cysts rarely require treatment unless they become large and bothersome.

### Keloids

**Keloids** are elevated, irregularly shaped, progressively enlarging scars. They arise from excessive amounts of collagen in the stratum corneum during scar formation in connective tissue repair. These lesions are more common in young adults and appear within 1 year of the initial trauma.

This abnormal response most often occurs in people of African and Asian descent who sustain burns of the skin, but even seemingly minor trauma can result in keloid formation. There is a familial tendency to develop keloids. Other risk factors for keloid formation include excessive tension on a wound and poor alignment of skin edges following accidental or intentional skin trauma. Certain skin surfaces are also more likely to develop keloids: the chin, ears, shoulders, back, and lower legs.

The excessive scar formation is associated with increased metabolic activity of fibroblasts and increased type III collagen. The principal cells of the keloids are myofibroblasts, which have characteristics of both fibroblasts and smooth muscle cells. The swollen appearance of the keloids is the result of an excess of extracellular material.

The keloids first appear as red, firm, rubbery plaques that persist for several months after the initial trauma (Figure 16–1 ■). Uncontrolled overgrowth over time causes the keloids to extend beyond the original scar. Eventually, the keloid becomes smooth and hyperpigmented.

### Nevi

**Nevi**, more commonly called *moles*, are flat or raised macules or papules with rounded, well-defined borders (Figure 16–2 ■).

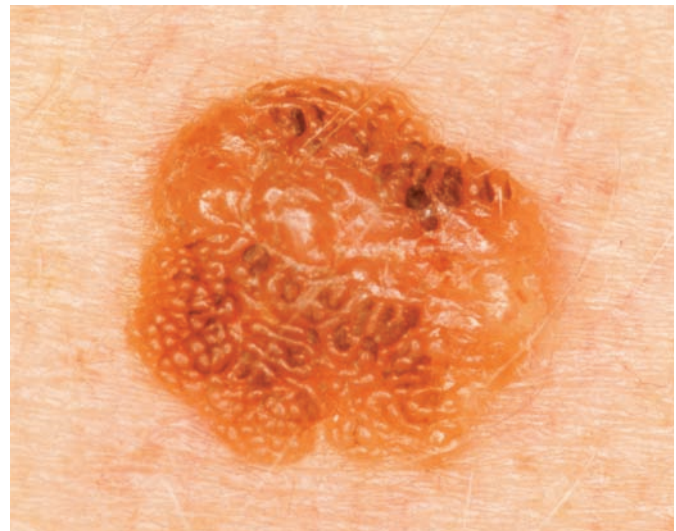


**Figure 16–1 ■** Keloids form as a result of deposits of excessive amounts of collagen during scar formation.

Source: Martin Rotker/Phototake NYC.

Nevi arise from melanocytes during early childhood, with the cells initially accumulating at the junction of the dermis and epidermis. Over time, the cluster of cells moves into the dermis, and the lesion becomes visible. Almost all adults have nevi.

Nevi range from flesh colored to black and occasionally contain hair. They can occur on any skin surface of the body and may arise as single lesions or in groups. Some pigmented nevi can transform into malignant lesions. Although the average adult has about 20 nevi, only 4 people out of 100,000 de-



**Figure 16–2 ■** Nevi (moles) arise from melanocytes and are common in all adults.

Source: Stephen J. Krasemann/Photo Researchers, Inc.

velop a malignant melanoma (Porth, 2005). However, it is important to monitor nevi for changes in size, thickness, color, bleeding, or itching. If any of these changes occur, the person should seek immediate professional assessment.

## Angiomas

**Angiomas**, also called *hemangiomas*, are benign vascular tumors. They appear in the adult in different forms:

- **Nevus flammeus** (port-wine stain) is a congenital vascular lesion that involves the capillaries. The lesions tend to occur on the upper body or face as macular patches that range from light red to dark purple. These lesions are present at birth and grow proportionately with the child into adulthood.
- **Cherry angiomas** are small, rounded papules that may occur at any age, but they most commonly arise in the 40s and gradually increase in number. The lesions range in color from bright red to purple. These lesions are often found on the trunk.
- **Spider angiomas** are dilated superficial arteries. They are common in pregnant women and in clients with hepatic disease. Spider angiomas occur most often on the face, neck, and upper chest. The lesions are usually small, bright red papules with radiating lines.
- **Telangiectases** are single dilated capillaries or terminal arteries that appear often on the cheeks and nose. These lesions are most common in older adults and result from photoaged skin. The lesions look like broken veins.
- **Venous lakes** are small, flat, blue blood vessels. They are seen on the exposed skin of the older adult: the ears, lips, and backs of the hands.

## Skin Tags

Skin tags are soft papules on a pedicle. They can be as small as a pinhead or as large as a pea and are most often found on the front or side of the neck and in the axillae, as well as in areas where clothing (such as underwear) rubs the skin. These lesions have normal skin color and texture.

## Keratoses

A **keratosis** is any skin condition in which there is a benign overgrowth and thickening of the cornified epithelium. These lesions most often appear in adults after age 50. *Seborrheic keratoses* appear as superficial flat, smooth, or warty-surfaced growths, 5 to 20 mm in diameter, most often on the face and trunk. The lesions may be tan, waxy yellow, dark brown, or flesh colored, and they often appear greasy. They are most often seen in the older adult and do not appear to be related to damage from sun exposure.

## THE CLIENT WITH PSORIASIS

**Psoriasis** is a chronic immune skin disorder characterized by raised, reddened, round circumscribed plaques covered by silvery white scales (Figure 16–3 ■). The size of these lesions varies. The lesions may appear anywhere on the body, but they are most commonly found on the scalp, extensor surfaces of the arms and legs, elbows, knees, sacrum, and around the nails. As with any chronic illness, the skin manifestations may occur and disappear throughout life, with no discernible pattern to the recurrence.



**Figure 16–3** ■ The characteristic lesions of psoriasis are raised, red, round plaques covered with thick, silvery white scales.

Source: NMSB/Custom Medical Stock Photo.

The incidence of psoriasis is lower in warm, sunny climates. Onset usually occurs in the 20s, but it may occur at any age. Psoriasis occurs more often in Caucasians; men and women are affected equally. Sunlight, stress, seasonal changes, hormone fluctuations, steroid withdrawal, and certain drugs (such as alcohol, corticosteroids, lithium, and chloroquine) appear to exacerbate the disorder. About one-third of clients have a family history of psoriasis. Trauma to the skin from such events as surgery, sunburn, or excoriation is also a common precipitating factor; lesions that result from trauma are called Köbner's reaction (Porth, 2005).

## Pathophysiology

Normally, the keratinocyte (an epidermal cell making up 95% of the epidermis) migrates from the basal cell to the stratum corneum (the outer skin layer) in about 14 days and is sloughed off 14 days later. Psoriatic skin cells, by contrast, have a shorter cycle of growth, completing the journey to the stratum corneum in only 4 to 7 days, a condition called hyperkeratosis. These immature cells produce an abnormal keratin that forms thick, flaky scales at the surface of the skin. The more rapid cell metabolism stimulates increased vascularity, which contributes to the erythema of the lesions. As part of the abnormal process, certain immune cells become overactive and release proteins called cytokines. One of the cytokines is tumor necrosis factor (TNF); in psoriasis TNF causes inflammation, further contributing to plaque formation.

Psoriasis vulgaris is the most common form of psoriasis. The lesions can be found anywhere on the skin but most commonly involve the skin over the elbows, knees, and scalp. Initially, the lesions are papules that form into well-defined erythematous plaques with thick, silvery white scales. The plaques in darker skinned persons may appear purple.

Permanent remission of psoriasis is rare. The prognosis depends on the type, extent, and severity of the initial attack. The age of onset is also a factor; early onset disease is usually more severe.

## Manifestations

The characteristic lesions in psoriasis are well-demarcated regions of erythematous plaques that shed thick, silvery white flakes. Pruritus is common over the psoriatic lesions. If the lesions are located in an intertriginous zone, such as between the

toes, under the breasts, or in the perianal region, the psoriatic scales may soften, allowing painful fissures to form. When psoriasis affects the nails, pitting and a yellow or brown discoloration result. The nail may separate from the nail bed, thicken, and crumble. The involved nails, which are more often fingernails than toenails, are at high risk for infection. The client may also exhibit manifestations of psoriatic arthritis, seen most often in the distal interphalangeal joints, especially if the fingernails are involved.

## INTERDISCIPLINARY CARE



Treatment is based on the type of psoriasis, the extent and location of the lesions, the age of the client, and the degree of disfigurement or disability.

### Diagnosis

Skin biopsy may be done if the client presents with atypical manifestations or to differentiate psoriasis from other inflammatory or infectious skin disorders. In addition, an ultrasound may reveal typical psoriatic changes in the stratum corneum and inflammation of the dermis.

### Medications

A variety of medications and treatments may be prescribed, including topical medications and photochemotherapy. Although there is no cure, treatment decreases the severity and pain of the lesions.

Topical medications are administered to decrease inflammation, prolong the maturity time of keratinocytes, and increase remission time. Corticosteroids, tar preparations, anthralin, and the retinoids are typically used. Box 16–2 outlines general guidelines for teaching clients to apply topical medications.

Topical corticosteroids decrease inflammation, suppress mitotic activity of psoriatic cells, and delay the movement of keratinocytes to the surface of the skin (thus giving them time to mature and decreasing hyperkeratosis). The most effective topical corticosteroids are potent preparations that are well absorbed through the skin and are used under an occlusive dressing. Cor-

ticosteroids may also be taken systemically or injected directly into the lesions. However, corticosteroids rarely cause a lasting remission and may cause the psoriasis to become unstable (McPhee et al., 2007). They are therefore used for repeated short periods of treatment and combined with other measures, such as tar preparations, occlusions, or a topical retinoid.

Tar preparations (such as Estar, Psorigel, and Fototar) suppress mitotic activity and are also anti-inflammatory. Their exact mechanism of action is unknown, but they are effective in removing scales and increasing remission time. Preparations made of coal tar are messy, cause staining, and have an unpleasant odor, but they are an effective form of treatment.

Topical anthralin (dithranol) inhibits the mitotic activity of epidermal cells and is effective in some cases of chronic, localized psoriasis that do not respond to other topical agents. The medication is applied to the plaque patches at bedtime and left in place for 8 to 12 hours. Clients should be tested for sensitivity to the drug before use, and it should not be applied to inflamed or open areas of skin.

Calcipotriene (Dovonex) (a vitamin D analog) has been effective and safe in both the short-term and long-term treatment of psoriasis. It inhibits cell proliferation in the epidermis and facilitates cell differentiation. Although a derivative of topical vitamin D, calcipotriene does not seem to affect bone or calcium metabolism. Although more irritating than calcipotriene, tazarotene gel (Avage, Tarorac) is a topical retinoid that may also be used to treat mild to moderate psoriasis. Etanercept (Enbrel), an anti-TNF receptor medication, may be given by injection to decrease inflammation, and is especially useful in treating psoriatic arthritis.

### Treatments

Psoriasis that is generalized (i.e., involves more than 30% of the body surface) is difficult to treat with topical medications. Treatments for generalized psoriasis include ultraviolet light therapy and photochemotherapy.

**ULTRAVIOLET LIGHT THERAPY** Ultraviolet-B (UVB) light is the treatment of choice for generalized psoriasis (McPhee et al., 2007). UVB light decreases the growth rate of epidermal

### BOX 16–2 General Guidelines for Applying Topical Medications

Each time a medication is applied, the skin surface must be clean and dry. Remove the medication from the previous application. Remove creams by washing the skin with tap water; remove ointments by washing the skin first with mineral oil and then with a mild soap and water.

- To apply gels, creams, and pastes: Squeeze about 1/2 to 1 inch of the gel or cream into the palm of the hand. Rub the hands together until they are covered. Apply gels and creams to the affected areas with long strokes until the skin is thinly covered. Differences from these general guidelines follow:
  - a. Corticosteroids are usually applied two to three times a day in small amounts and rubbed directly onto the lesions. Apply the medication after a bath and cover with an occlusive dressing.

- b. Apply medications containing tar in the direction of hair growth. Do not apply these medications to the face, to the genitals, or in skin folds. If the tar is water based or oil based, it will stain clothing.
  - c. Wear gloves when applying anthralin stains.
- To apply lotions: Shake the bottle of lotion well. Pour a small amount into the palm of the hand, and pat the medication onto the skin. If the lotion is thin, apply it with a gauze pad.
  - To apply sprays: Hold the container about 6 inches from the skin, and apply the medication in a short spray.
  - To apply medicated shampoo: Rinse out medication from the previous application. Apply the shampoo, massage into the hair and over the scalp carefully, and allow it to remain for the prescribed time. Rinse.
  - To apply pastes: Use enough paste on an applicator (such as a wooden tongue depressor) to cover the lesion thinly.

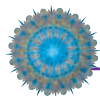


cells, thereby decreasing hyperkeratosis. Mercury vapor lights or fluorescent UV tubes provide the UVB light; the latter are often arranged in a cabinet so the client can stand and expose psoriatic lesions more easily. These units may be purchased or constructed to be used in the client's home.

The light therapy is administered in gradually increasing exposure times, until the client experiences a mild erythema, like a mild sunburn. Treatments are given three times a week as an outpatient and are measured in seconds of exposure. The eyes are shielded during the treatment. The erythema response occurs in about 8 hours. Careful assessment is necessary to prevent more severe burning, which could exacerbate the psoriasis. In clients with extensive psoriasis, UVB treatments may be combined with tar preparations, which increase the photosensitivity of the skin.

**PHOTOCHEMOTHERAPY** In photochemotherapy, a light-activated form of the drug methoxsalen is used. This drug is an antimetabolite that inhibits DNA synthesis and thereby prevents cell mitosis, decreasing hyperkeratosis. Exposure to ultraviolet-A (UVA) rays activates methoxsalen; it is administered orally, and the client is exposed to UVA 2 hours later. The eyes are covered by dark glasses during the treatment. Treatments are administered 2 to 3 times a week; usually 10 to 20 total treatments are given over 1 to 2 months. Treatment causes tanning, and direct sunlight must be avoided for 8 to 12 hours thereafter. If the client exhibits erythema, the treatments are stopped until the redness and swelling resolve.

Photochemotherapy has had a high success rate in achieving remission of psoriasis, but it can accelerate aging of exposed skin, induce cataract development, alter immune function, and increase the risk of melanoma.



## NURSING CARE

The client with psoriasis requires nursing care to meet physical and psychologic responses to the illness. The nurse provides teaching for self-care and emotional support through nonjudgmental acceptance.

### Nursing Diagnoses and Interventions

The nursing interventions discussed in this section focus on common problems of impaired skin integrity and disturbed body image.

#### Impaired Skin Integrity

Psoriatic lesions range from several scales to large, open areas. Typical psoriatic skin lesions increase the risk of infection, which can further compromise healing. In addition, certain treatments (e.g., the use of UVA or retinoids) may cause erythema or peeling of the skin, further altering skin integrity.

- Teach methods to reduce injury to the skin when taking therapeutic baths or treatments:
  - Use warm, not hot, water.
  - Gently rub lesions with a soft washcloth, using a circular motion.
  - Dry the skin with a soft towel, using a blotting or patting motion.
  - Keep the skin lubricated at all times.

*Hot water and dry skin increase pruritus, further stimulating the itch–scratch–itch cycle. Dry skin also worsens psoriasis. Washing or drying the skin with rough linens or pressure may excoriate the skin over the psoriatic lesions.*

- Explain application of topical medications:
  - Apply the medication as prescribed in a thin layer, using hands (gloved, if appropriate), wooden tongue depressors, or a gauze pad.
  - Avoid getting medications in the eyes, on mucous membranes, or in skin folds.
  - Apply a covering (occlusive dressing) over the medicated areas as prescribed, especially when using corticosteroids. Usually, the covering is applied for only 8 hours, often during the evening and night hours. Choose some type of plastic wrap that covers the area well.

*Applying a thin layer of medication more frequently is often more effective than applying a single thick layer of medication. The medications used to treat psoriasis may irritate the eyes and mucous membranes; when applied in skin folds, they may also cause maceration (skin breakdown due to prolonged exposure to moisture). Topical corticosteroids are often covered with occlusive dressings to increase absorption and thus facilitate treatment. However, constant occlusion may increase the effects of the medications to undesired levels and also increases the risk for infections.*

- Teach manifestations of infection and how to contact the health-care provider if these occur: elevated temperature, increased swelling, redness, pain, increase in drainage, and any change in the color of the drainage. *The client with skin lesions is at high risk for infection, as the skin is the body's first line of defense.*
- Teach manifestations of the complications of treatment: excoriation, increased erythema, increased peeling, and blister formation. *The topical medications or treatments may damage cells through chemical burns or excessive exposure to ultraviolet light. Times and methods of treatment need to be adjusted if these manifestations occur.*

#### Disturbed Body Image

The chronic skin lesions of psoriasis often cause clients to isolate themselves from social contacts, withdraw from normal roles and responsibilities, and feel helpless or powerless.

- Establish a trusting relationship by expressing acceptance of the client, both verbally and nonverbally. For example, touch the client during social communications, demonstrating that the lesions are not contagious or offensive. *One's body image is affected not only by self-perception but also by the responses of others. Nonjudgmental acceptance helps the client adapt to the change in body image. By touching the client during interactions, the nurse demonstrates that acceptance.*
- Encourage the client to verbalize feelings about self-perception in view of the chronic nature of psoriasis and to ask questions about the disease and treatment. *The client adapts to a changed body image through a process of recognition, acceptance, and resolution. Each person responds individually to disfigurement and loss.*
- Promote social interaction through family involvement in care, and referral to support groups of people with psoriasis

or other chronic skin conditions. *Acceptance by others is critical to acceptance of self. Psoriasis treatment is lifelong, time consuming, and often unappealing. By becoming involved in care, the family communicates acceptance. Sharing experiences with others who have the same health problem is a source of strength in adjusting to a visible, chronic illness.*

## Community-Based Care

Client and family teaching focuses on treatments and skin care needs. The following topics should be addressed:

- The chronic nature of the disease, factors that may precipitate an exacerbation, and methods to reduce stress

- Interventions for pruritus and dry skin, and specific care for psoriasis:
  - Expose the skin to sunlight, but avoid sunburn.
  - Avoid trauma to the skin (e.g., do not scrub off scales, and use only an electric razor).
  - Avoid exposure to contagious illnesses such as influenza and colds.
  - Discuss current medications with the healthcare provider. Certain drugs (such as indomethacin [Indocin], lithium, and beta-adrenergic blocking agents) are known to precipitate exacerbations of psoriasis.
- Suggest the National Psoriasis Foundation as a resource.

## INFECTIONS AND INFESTATIONS OF THE SKIN

The skin's resistance to infections and infestations is provided by protective mechanisms, including skin flora, sebum, and the immune response. Although the skin is normally resistant to infections and infestations, these disorders may occur as a result of a break in the skin surface, a virulent agent, and/or decreased resistance due to a compromised immune system. This section discusses skin disorders resulting from bacterial infections, fungal infections, parasitic infestations, and viral infections.

### THE CLIENT WITH A BACTERIAL INFECTION OF THE SKIN

A number of bacteria normally inhabit the skin and do not cause an infection. However, when a break in the skin allows invasion by pathogenic bacteria, an infection, called a *pyoderma*, may occur. The most common bacterial infections are caused by gram-positive *Staphylococcus aureus* and beta-hemolytic streptococci.

Bacterial infections of the skin may be primary or secondary. Primary infections are caused by a single pathogen and arise from normal skin; secondary infections develop in traumatized or diseased skin.

Most bacterial infections are treated by a primary care provider, and the client remains at home for care. If the infection becomes more serious, however, inpatient care may be required. In addition, nosocomial infections of wounds or open lesions in hospitalized clients are often the result of bacterial infections, especially by methicillin-resistant *Staphylococcus aureus* (MRSA).

### Pathophysiology

Bacterial infections of the skin arise from the hair follicle, where bacteria can accumulate and grow and cause a localized infection. However, the bacteria also can invade deeper tissues and cause a systemic infection, a potentially life-threatening disorder. Various types of bacterial infections involve the skin, including folliculitis, furuncles, carbuncles, cellulitis, and erysipelas.

#### Folliculitis

**Folliculitis** is a bacterial infection of the hair follicle, most commonly caused by *Staphylococcus aureus*. The infection begins at the follicle opening and extends down into the follicle. The bacteria release enzymes and chemical agents that cause an inflam-

mation. The lesions appear as pustules surrounded by an area of erythema on the surface of the skin (Figure 16–4 ■). The lesions are accompanied by discomfort ranging from slight burning to intense itching. A major complication is abscess formation. Folliculitis is found most often on the scalp and extremities. It is also often seen on the face of bearded men (called *sycosis barbae*), on the legs of women who shave, and on the eyelids (called a *stye*).

Although folliculitis may appear without any apparent cause, contributing factors include poor hygiene, poor nutrition, prolonged skin moisture, tight heavy fabrics on the upper legs, and trauma to the skin.

#### PRACTICE ALERT

A specific type of folliculitis, called "hot tub folliculitis," is caused by *Pseudomonas aeruginosa*, and is characterized by follicular or pustular lesions that occur 1 to 4 days after being in a hot tub, whirlpool, or public swimming pool.

#### Furuncles

**Furuncles**, often called *boils*, are also inflammations of the hair follicle. They often begin as folliculitis, but the infection spreads down the hair shaft, through the wall of the follicle, and into the



**Figure 16–4 ■** The lesions of folliculitis are pustules surrounded by areas of erythema.

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dermis. The causative organism is commonly *Staphylococcus aureus*. A furuncle is initially a deep, firm, red, painful nodule from 1 to 5 cm in diameter (Figure 16–5 ■). After a few days, the nodule changes into a large, painful cystic nodule. The cysts may drain substantial amounts of purulent drainage.

One or more furuncles may occur on any part of the body that has hair. Contributing factors include poor hygiene, trauma to the skin, areas of excessive moisture (including perspiration), and systemic diseases such as diabetes mellitus and hematologic malignancies.

### Carbuncles

A **carbuncle** is a group of infected hair follicles. The lesion begins as a firm mass located in the subcutaneous tissue and the lower dermis. This mass becomes swollen and painful and has multiple openings to the skin surface. Carbuncles are most frequently found on the back of the neck, the upper back, and the lateral thighs. In addition to the local manifestations, the client may experience chills, fever, and malaise. The contributing factors for carbuncles are the same as for furuncles. Both infections are more common in hot, humid climates.

### Cellulitis

**Cellulitis** is a localized infection of the dermis and subcutaneous tissue. Cellulitis can occur following a wound or skin ulcer or as an extension of furuncles or carbuncles. The infection spreads as a result of a substance produced by the causative organism, called spreading factor (hyaluronidase). This factor breaks down the fibrin network and other barriers that normally localize the infection. The area of cellulitis is red, swollen, and painful (Figure 16–6 ■). In some cases, vesicles may form over the area of cellulitis. The client may also experience fever, chills, malaise, headache, and swollen lymph glands.

### Erysipelas

**Erysipelas** is an infection of the skin most often caused by group A streptococci. Chills, fever, and malaise are prodromal symptoms, occurring from 4 hours to 20 days before the skin lesion appears. The initial infection appears as firm red spots that enlarge and join to form a circumscribed, bright red, raised, hot lesion.



**Figure 16–5 ■** A furuncle (boil) is a deep, firm, red, painful nodule.

Source: ISM/Phototake NYC.



**Figure 16–6 ■** Cellulitis is a bacterial infection localized in the dermis and subcutaneous tissue. The involved area is red, swollen, and painful.

Source: Charles Stewart & Associates.

Vesicles may form over the surface of the erysipelas lesion. The area usually is painful, itches, and burns. Erysipelas most commonly appears on the face, ears, and lower legs.

## INTERDISCIPLINARY CARE



The diagnosis of a bacterial infection of the skin is made by assessing the appearance of the lesion and by identifying the causative organism. Antibiotics specific to the organism are used in treatment.

### Diagnosis

Drainage from a lesion or a blood culture may be ordered to identify the causative organism and target the most effective antibiotic. People who experience repeated bacterial skin infections or who provide care for others who exhibit infections may have a culture taken from the external nares to determine whether they are carriers of bacteria (e.g., MRSA) and are re-infecting themselves or others.

### Medications

The primary treatment for bacterial infections of the skin is an antibiotic specific to the organism. The antibiotic is usually taken orally, but may also be applied topically. Multiple furuncles and carbuncles may be treated with cloxacillin (a penicillinase-resistant penicillin); the cephalosporins also are often effective.



## NURSING CARE

Nursing care focuses on preventing the spread of infection and restoring normal skin integrity. Most clients provide self-care at home, but the incidence of secondary bacterial infections in the inpatient population is great enough to warrant their inclusion in planning and implementing care.

## Nursing Diagnosis and Interventions

### Risk for Infection

- Practice good hand washing and teach its importance.  
*Careful hand washing is one of the most effective methods to*

reduce the spread of infection both in and out of the hospital setting. Healthcare providers must wash their hands with soap and water before and after client care and between each client contact. All clients, family members, and visitors (both in the home and hospital setting) should be taught the importance of hand washing, but it is even more important for the client with a bacterial infection.

- Assess for and teach how to identify an increase in infection, which may be manifested systemically by fever, tachycardia, chills, and malaise. Local manifestations of the spread of the infection include an increase in erythema, the size of the lesion, and drainage. This assessment is especially important for older, debilitated, or immunosuppressed clients, and for those who have large or dirty wounds.

### PRACTICE ALERT

If a client with a bacterial skin infection is hospitalized, place on isolation precautions to limit the spread of the organisms to other clients.

- Cover draining lesions with a sterile dressing, and handle soiled dressings or linens according to standard precautions. When changing dressings, always wear disposable gloves and masks. These actions are necessary to prevent the spread of infection to other areas of the client's body, to other clients, to visitors, and to the nurse providing care.

## Community-Based Care

Client and family teaching focuses on facilitating tissue healing and eliminating the infection. Address the following topics:

- The importance of maintaining good nutrition
- The importance of maintaining cleanliness through careful hand washing and proper handling and disposal of dressings
- Preventing the spread of infection in the home by not sharing linens and towels and washing clothing and linens in hot water
- The importance of not squeezing or trying to open a bacterial lesion
- Avoiding plucking of nasal hair or picking nose
- The importance of taking the full course of prescribed antibiotics on a regular schedule until the prescribed supply is finished
- Bathing daily with an antibacterial soap (The client can gently wash off crusts during the bath. Warm compresses may be applied to the lesions two to three times a day to increase comfort and decrease swelling.)

## THE CLIENT WITH A FUNGAL INFECTION

Fungi are free-living plantlike organisms that live in the soil, on animals, and on humans. The fungi that cause superficial skin infections are called dermatophytes. In humans, the dermatophytes live on keratin in the stratum corneum, hair, and nails. Fungal disorders are also called *mycoses*.

## Pathophysiology

Fungal infections include dermatophytoses (tinea or ringworm) and candidiasis (yeast) infections.

## Dermatophytoses (Tinea)

Superficial fungal infections of the skin are called **dermatophytoses** or, more commonly, *ringworm*. Fungal infections occur when a susceptible host comes in contact with the organism. The organism may be transmitted by direct contact with animals or other infected persons or by inanimate objects such as combs, pillowcases, towels, and hats. The most important factor in the development of the infection is moisture; the onset and spread of the fungal infection is greatest in areas where moisture content is high, such as within skin folds, between the toes, and in the mouth. Other factors that increase the risk of a fungal infection include the use of broad-spectrum antibiotics that kill off normal flora and allow the fungi to grow, diabetes mellitus, immunodeficiencies, nutritional deficiencies, pregnancy, increasing age, and iron deficiency. Fungal infections of the skin are more common in warm, humid climates. The dermatophyte infections are named by the body part affected, as follows:

- Tinea pedis is a fungal infection of the soles of the feet, the space between the toes, and/or the toenails (Figure 16–7 ■). More often called *athlete's foot*, this is the most common tinea infection. The lesions vary from mild scaliness to painful fissures with drainage, and they are usually accompanied by pruritus and a foul odor. The infection is often chronic, absent in winter but reappearing in hot weather when perspiring feet are encased in shoes.
- Tinea capitis is a fungal infection of the scalp. The primary lesions are gray, round, bald spots, often accompanied by erythema and crusting. The hair loss is usually temporary. Tinea capitis is seen more often in children than in adults.
- Tinea corporis is a fungal infection of the body. It can be caused by several different fungi, and the lesions vary according to the causative organism. The most common lesions are large circular patches with raised red borders of vesicles, papules, or pustules. Pruritus and erythema are also present.
- Tinea versicolor is a fungal infection of the upper chest, back, and sometimes the arms. The lesions are yellow, pink, or brown sheets of scaling skin. The patches do not have pigment and do not tan when exposed to ultraviolet light.



**Figure 16–7 ■** Tinea pedis (athlete's foot) is a fungal infection that often occurs between the toes.

Source: SPL/Photo Researchers, Inc.



- Tinea cruris is a fungal infection of the groin that may extend to the inner thighs and buttocks. Often called “jock itch,” it is often associated with tinea pedis and is more common in people who are physically active, are obese, and/or wear tight underclothing.

### Candidiasis

**Candidiasis** infections are caused by *Candida albicans*, a yeastlike fungus. This fungus is normally found on mucous membranes, on the skin, in the vagina, and in the gastrointestinal tract. The fungus becomes a pathogen when the following factors encourage its growth:

- A local environment of moisture, warmth, or altered skin integrity
- The administration of systemic antibiotics
- Pregnancy
- The use of birth control pills
- Poor nutrition
- The presence of diabetes mellitus, Cushing’s disease, or other chronic debilitating illnesses
- Immunosuppression
- Some malignancies of the blood.

Candidiasis affects the outer layers of the skin and mucous membranes of the mouth, vagina, uncircumcised penis, nails, and deep skin folds. The first sign of infection is a pustule that extends under the stratum corneum. The pustule has an inflamed base and often burns and itches. As the infection spreads, the accumulation of inflammatory cells and shedding of surface cells produce a white to yellow curdlike substance that covers the infected area (Figure 16–8 ■). Satellite lesions (maculopapular areas found outside the clearly demarcated border of the original infection) are characteristic of candidiasis. The appearance of the infection differs by location, as summarized in Table 16–2.

## INTERDISCIPLINARY CARE



Fungal infections are primarily diagnosed in outpatient settings and treated at home, but may also occur in hospitalized clients. The treatment is the same, regardless of the setting.



**Figure 16–8** ■ *Candida albicans*, a fungus, causes a skin infection characterized by erythema, pustules, and a typical white substance covering the area.

Source: Stuart M. Levitz, M.D.

**TABLE 16–2 Characteristics of Candidiasis Infections by Location**

LOCATION	CHARACTERISTICS
Skin folds (under breasts, in groin, axillae, anus, umbilicus, and between toes or fingers)	Erythematous lesions that are either dry or moist. The lesions have clear borders, and satellite lesions are present.
Nails	Nail bed is red, swollen, and painful.
Mouth (thrush)	Mucous membranes are red and may be swollen; surface is covered with white, creamy material. Eroded areas may be present over the tongue and the oral cavity.
Penis (balanitis) (glans and shaft)	The penis is covered with small, red, clearly demarcated lesions that are painful and itch. The lesions may be covered with a white plaque.
Vagina	Red mucous membranes contain brighter red, demarcated, oozing lesions. The cervix may be covered with white plaque. A white, cheesy, foul-smelling vaginal discharge is present, accompanied by itching and burning. The vaginal and labial membranes may be swollen; the infection may extend to the anus and groin.

### Diagnosis

Diagnostic tests are conducted to determine the causative fungi and may include cultures, microscopic examination using KOH, and examination of the skin with ultraviolet light (Wood’s lamp). See Chapter 15 ∞ for further information.

### Medications

Fungal infections of the skin are treated by topical or systemic antifungal medications. Nursing implications for the antifungal medications are described in the Medication Administration box on the following page.

- Tinea capitis is treated by shampooing the hair two to three times a week, applying a topical antifungal to inactivate organisms on the hair, and taking griseofulvin (Fulvicin), an antifungal agent, orally.
- Tinea pedis is treated by soaking the feet in Burrow’s solution, potassium permanganate solution, or saline solution to remove crusts and scales. Topical antifungals are applied to the infected areas for several weeks.
- Mild cases of tinea cruris are treated with topical medications for 3 to 4 weeks. Over-the-counter (OTC) medications (such as miconazole, clotrimazole, butenafine, and terbinafine) are often less expensive and effective (McPhee et al., 2007). More severe cases may require oral griseofulvin.

Candidiasis infections are treated, depending on the location, with oral medication or with powder or vaginal suppositories.





## MEDICATION ADMINISTRATION

### ANTIFUNGAL AGENTS

Examples:

<b>Butenafine (Mentax)</b>	<b>Undecylenic acid (Desenex)</b>
<b>Clotrimazole (Mycelex)</b>	<b>Ketoconazole (Nizoral)</b>
<b>Nystatin (Mycostatin, Nilstat)</b>	<b>Fluconazole (Diflucan)</b>
<b>Econazole (Spectazole)</b>	<b>Amphotericin B (Fungizone)</b>
<b>Oxiconazole (Oxistat)</b>	<b>Griseofulvin (Fulvicin)</b>
<b>Miconazole (Monistat)</b>	

Antifungal medications are prepared in a variety of forms, depending on the specific drug: powders, creams, shampoos, suspensions, troches, vaginal suppositories, and oral tablets. Some drugs interfere with the permeability of the fungal cell membrane, others interfere with DNA synthesis. Most of these medications are fungistatic but in large doses they may be fungicidal.

### Nursing Responsibilities

- When taking the health history, ask about known hypersensitivity reactions to these agents; document carefully.
- Assess for side effects: skin rash, local irritation, gastrointestinal symptoms (if given PO), and mental status.
- Administer ketoconazole with food to minimize gastrointestinal irritation.
- Shake suspensions well before administration, and ask the client to swish them around the mouth before swallowing.
- Tell the client to allow oral tablets to dissolve in the mouth.

### Health Education for the Client and Family

- Therapy usually continues over a long period of time, but regular use of medications for the recommended period is necessary. Do not miss doses, and complete the full treatment.
- For griseofulvin: Take with meals or foods high in fat (such as ice cream) to avoid stomach upset and help with absorption. Avoid alcohol (which may cause rapid pulse and flushing) and exposure to sunlight (this drug causes increased sensitivity).
- For nystatin: Dissolve lozenges completely in the mouth. Hold suspensions in the mouth and swish throughout the mouth as long as possible before swallowing. Insert intravaginal medication high in the vagina. Continue with intravaginal applications throughout the menses.
- For antifungal shampoo: Use two times a week for 4 weeks, allowing at least 3 days between each shampoo. Wet hair, apply shampoo to produce lather, leave in place for 1 minute, then rinse. Apply shampoo a second time, lather, leave in place for 3 minutes, then rinse thoroughly.
- For topical application: Rub well into the affected areas, but do not get the medication in your eyes.
- For vaginal candidiasis infections: During therapy, refrain from sexual intercourse or advise partner to use a condom.
- Your sexual partner will need to be treated at the same time so that you do not pass the infection back and forth to each other.

Nystatin (Mycostatin) is an antibiotic effective in controlling the infection. Fluconazole (Diflucan), an oral antifungal agent, is also effective.



## NURSING CARE

Many people treat themselves with OTC antifungal medications. It is recommended, however, that the person be professionally diagnosed the first time the infection occurs. If symptoms reappear, self-treatment is usually satisfactory. The interventions discussed for nursing care of the client with a bacterial infection are also appropriate for the client with a fungal infection. Teaching topics specific to fungal infections are as follows:

- Fungal diseases are contagious. Do not share linens or personal items with others.
- Use a clean towel and washcloth each day.
- Carefully dry all skin folds, including those under the breasts, under the arms, and between the toes.
- Wear clean cotton underclothing each day.
- Fungi grow in moist environments, such as on sweaty feet. To prevent further infections:
  - Do not wear the same pair of shoes every day.
  - Wear socks that permit moisture to wick away from the skin surface.
  - Do not wear rubber- or plastic-soled shoes.
  - Use talcum powder or an OTC antifungal powder twice a day.
- For vaginal *Candida albicans* infection:
  - Avoid tight clothing, such as jeans and panty hose.
  - Wear cotton or cotton-crotch underwear.

- Bathe more frequently, and dry the genital area well.
- Have your sexual partner treated at the same time to avoid passing the infection back and forth to each other.

### PRACTICE ALERT

Recommend the client with repeated skin infections have a blood glucose test, because this may indicate diabetes mellitus.

## THE CLIENT WITH A PARASITIC INFESTATION

Infestations of the skin by parasites are more common in developing countries but may occur in any geographic area of the world. They affect people of all social classes but are associated with crowded or unsanitary living conditions.

### Pathophysiology

Two of the more common parasitic infestations of the skin are caused by lice and mites. These parasites do not normally live on the skin, but infest the skin through contact with an infested person or contact with clothing, linens, or objects infested with the parasites.

### Pediculosis

**Pediculosis** is an infestation with lice, parasites that live on the blood of an animal or human host. The louse is a 2- to 4-mm oval organism with a stylet that pierces the skin; an anticoagulant in its saliva prevents host blood from clotting while it eats. The female louse lays its eggs (small pearl-gray or brown eggs, called nits) on hair shafts. The louse within the egg hatches, reaches the adult reproductive stage, and dies in 30 to 50 days (Porth, 2005).

There are three types of human pediculosis:

- **Pediculosis corporis** is an infestation with body lice. This type of infestation is more common in people who do not have access to facilities for bathing or washing clothes, such as the homeless. The lice live in clothing fibers and are transmitted primarily by contact with infested clothing and bed linens. The skin lesions occur at the site of a louse bite; macules appear initially, followed by wheals and papules. Pruritus is common, and scratching often results in linear excoriations. Secondary infections cause hyperpigmentation and scarring. The lesions are most often seen on the shoulders, trunk, and buttocks.
- **Pediculosis pubis** is an infestation with pubic lice (often called crabs). This infestation is spread through sexual activity with someone already infested or by contact with infested clothing or linens. The lice are found in the pubic region and occasionally spread to the axillae or men's beards. The lice cause skin irritation and intense itching.
- **Pediculosis capitis** is an infestation with head lice. The lice are most often found behind the ears and at the nape of the neck but may also spread to other hairy areas of the body: the eyebrows, pubic area, or beard. The lice are transmitted by contact with an infected person. Manifestations of head lice include pruritus, scratching, and erythema of the scalp. If untreated, the hair appears matted and crusted with a foul-smelling substance.

### Scabies

**Scabies** is a parasitic infestation caused by a mite (*Sarcoptes scabiei*). The pregnant female mite burrows into the skin and lays two to three eggs each day for about a month. The eggs hatch in 3 to 5 days, and the larvae migrate to the surface but burrow into the skin for food or protection. The larvae develop, and the cycle repeats. Scabies infestation affects people of all socioeconomic classes. The infestation is found in webs between the fingers, the inner surfaces of the wrist and elbow, the axillae, the female nipple, the penis, the belt line, and the gluteal crease. The lesions are a small red-brown burrow, about 2 mm in length, sometimes covered with vesicles, which appears as a rash. Pruritus in response to the mite or its feces is common, especially at night, and excoriations may develop. The excoriations predispose the person to secondary bacterial infections.

## INTERDISCIPLINARY CARE

Parasitic infestations are diagnosed by identifying the organism and are treated with medications that kill the lice or mites.

### Diagnosis

When a client has manifestations of pediculosis, the hair shaft and the clothing are examined to identify the lice or the nits. Microscopic examination of the parasite provides a positive diagnosis. Scabies is diagnosed by skin scrapings and microscopic examination for the mites or their feces.

### Medications

Lice are eradicated with agents that kill the parasite. Infestations of the body and pubic area are treated with topical medications that contain gamma benzene hexachloride, malathion (Prioderm lotion), or permethrin (NIX).

Infestations of the pubic hair are treated with shampoos containing lindane, such as Kwell. Head lice are treated with permethrin 1% cream (NIX). The medication is applied to the hair and left on for 30 minutes to 8 hours before being rinsed off. The treatment should be repeated in a week to kill newly hatched lice. A fine-toothed comb can be used to comb the dead nits off the hair shaft. Infestations of the eyebrows and eyelashes are treated by applying a thick covering of petroleum jelly twice a day for 8 days.

Scabies may be eradicated by a single treatment of lindane lotion or Kwell applied to the entire skin surface for 12 hours.

The associated itching is treated with systemic or topical medications, including corticosteroids. Secondary bacterial infections are treated with the appropriate antibiotic.



## NURSING CARE

Nursing care for clients with a parasite infestation most often focuses on teaching to prevent infestation or to eradicate an existing infestation. For a hospitalized client with pediculosis, isolation procedures are instituted until the client no longer has the infestation.

Client and family teaching is necessary to facilitate treatment at home, to prevent the spread of the infestation, and to dispel the myth that lice infest only people with poor hygiene or in dirty living conditions. Specific information includes the following:

- Wash clothing and linens in soap and hot water, or have them dry cleaned.
- Ironing the clothes kills any lice eggs.
- Personal care items, such as combs or brushes, may be boiled to kill the parasites.
- All family members and sexual partners must also be treated.
- Avoid using the combs, brushes, or hats of others.
- Lice and mites may infest anyone.

## THE CLIENT WITH A VIRAL INFECTION

Viruses are pathogens that consist of an RNA or DNA core surrounded by a protein coat. They depend on live cells for reproduction and so are classified as intracellular pathogens. The viruses that cause skin lesions invade the keratinocyte, reproduce, and either increase cellular growth or cause cellular death.

An increase in the incidence of viral skin disorders has been attributed to a variety of causes. Some commonly used drugs, such as birth control medications and corticosteroids, are known to have immunosuppressive properties that allow the viruses to multiply. Other drugs, such as antibiotics, kill off normal skin bacteria that would otherwise serve as defense against viral infections.

### Pathophysiology

Viral infections cause many different kinds of skin disorders, including warts, herpes simplex infections, and herpes zoster infections.

### Warts

**Warts**, or *verrucae*, are lesions of the skin caused by the human papillomavirus (HPV). More than 60 types of HPV have been found on the human skin and mucous membranes (Porth, 2005). Warts may be found on nongenital skin or genital skin

and mucous membranes. Nongenital warts are benign lesions; genital warts may be precancerous. Warts are transmitted through skin contact. Wart lesions may be flat, fusiform (tapered at both ends), or round, but most are round and raised and have a rough, gray surface. There are many different types of warts; location and appearance of the warts depend on the causative virus. Those most common are as follows:

- A common wart (*verruca vulgaris*) may appear anywhere on the skin and mucous membranes of the body, but it most commonly appears on the fingers. Common warts grow above the skin surface and may be dome shaped with ragged borders (Figure 16–9 ■).
- Plantar warts occur at pressure points on the soles of the feet. The pressure of shoes and walking prevents these warts from growing outward, so they tend to extend deeper beneath the skin surface than do common warts. Plantar warts are often painful.
- A flat wart (*verruca plana*) is a small flat lesion, usually seen on the forehead or dorsum of the hand.
- Condylomata acuminata, also called HPV or venereal warts, occur in moist areas, along the glans of the penis, in the anal region, and on the vulva and cervix. They are usually cauliflower-like in appearance and have a pink or purple color.

Warts resolve spontaneously when immunity to the virus develops. This response may take up to 5 years.

## Herpes Simplex

**Herpes simplex** (also called a *fever blister* or *cold sore*) virus infections of the skin and mucous membranes are caused by two types of herpesvirus: HSV-1 and HSV-2. Most infections above the waist are caused by HSV-1, with herpes simplex lesions most often found on the lips, face, and mouth. (Genital herpes infections, which result from either HSV-1 or HSV-2, are classified as sexually transmitted infections and are discussed in Chapter 52 ∞.) The virus may be transmitted by physical contact, oral sex, or kissing.

The infection begins with a burning or tingling sensation, followed by the development of erythema, vesicle formation, and pain (Figure 16–10 ■). The vesicles progress through pustules, ulcers, and crusting until healing occurs in 10 to 14 days.



**Figure 16–9 ■** The common wart, caused by a virus, appears as a raised, dome-shaped lesion.

Source: Kenneth E. Greer/Visuals Unlimited.



**Figure 16–10 ■** Herpes simplex is a viral infection of the skin and mucous membranes.

Source: Medical-On-Line Ltd.

The initial infection is often severe and accompanied by systemic manifestations, such as fever and sore throat; recurrences are more localized and less severe. The virus lives in nerve ganglia and may cause recurrent lesions in response to sunlight, menstruation, injury, or stress. Oral acyclovir may be used prophylactically to prevent recurrences and to treat recurrent outbreaks.

**HERPES ZOSTER** **Herpes zoster**, also called *shingles*, is a viral infection of a dermatome section of the skin caused by varicella zoster (the herpesvirus that also causes chickenpox). The infection is believed to result from reactivation of a varicella virus remaining in the sensory dorsal ganglia after a childhood infection of chickenpox. When reactivated, the virus travels from the ganglia to the corresponding skin dermatome area.

Herpes zoster most often affects adults over the age of 60 (Porth, 2005). Clients with Hodgkin's disease, certain types of leukemia, and lymphomas are more susceptible to an outbreak of the disease. Herpes zoster is more prevalent in immunocompromised people, such as those with human immunodeficiency virus (HIV) infections, those receiving radiation therapy or chemotherapy, and those who have had major organ transplants. The appearance of the lesions in people with HIV infections may be one of the first manifestations of immune compromise. The herpes eruption lasts for about 2 to 3 weeks and usually does not recur.

Herpes zoster lesions are vesicles with an erythematous base. The vesicles appear on the skin area supplied by the neurons of a single or associated group of dorsal root ganglia (although they may occur beyond this area in immunosuppressed people). The lesions usually appear unilaterally on the face, trunk, and thorax (Figure 16–11 ■). New lesions continue to erupt for 3 to 5 days, then crust and dry. Recovery occurs in 2 to 3 weeks. The client often experiences severe pain for up to 48 hours before and during eruption of the lesions. The pain may continue for weeks to months after the lesions have disappeared. The older adult is especially sensitive to the pain and often experiences more severe outbreaks of herpes zoster lesions.

Eruption of vesicles over a single dermatome usually only occurs one time. Generalized herpes zoster may indicate an associated immunocompromised disease, such as Hodgkin's disease or HIV infection. Clients infected with HIV are 20 times more likely to develop herpes zoster (McPhee et al., 2007).





**Figure 16–11** ■ Herpes zoster is a viral infection of a dermatome section of the skin. The typical lesions are painful vesicles lying along the path of the nerve.

Source: Barts Medical Library/Phototake NYC.

Complications of herpes zoster include postherpetic neuralgia (a sharp, spasmodic pain along the course of one or more nerves) and visual loss. The neuralgia, described as burning or stabbing, results from inflammation of the root ganglia. This complication is more common in clients over the age of 55 (McPhee et al., 2007). Permanent loss of vision may follow occurrence of lesions that arise from the ophthalmic division of the trigeminal nerve. The disease may disseminate in immunocompromised clients, causing lesions beyond the dermatome, visceral lesions, and encephalitis. This serious complication may cause death.

## INTERDISCIPLINARY CARE

The treatment for viral skin infections focuses on stopping viral replication and treating client responses, such as itching and pain.

### Diagnosis

Although diagnosis is usually based on manifestations and appearance of the lesions, laboratory tests may be necessary to differentiate herpes zoster from impetigo, contact dermatitis, and herpes simplex. The laboratory tests include a Tzanck smear that identifies the herpes virus, but it does not distinguish herpes zoster from herpes simplex. Cultures of fluid from the vesicles and antibody tests are used to make the differential diagnosis of herpesvirus types. HIV testing should be considered if clients are under age 55 with a history of HIV risk factors.

### Medications

Most viral skin disorders are treated with antiviral medications, and other types of medications are used to relieve pruritus and pain in clients with herpes zoster.

- **Warts.** Depending on their size, location, and any associated discomfort, warts may be treated with medications, cryotherapy, or electrodesiccation and curettage. A common method of wart removal is acid therapy, using a colloidal solution of 16% salicylic acid and 16% lactic acid. The solution is applied to the wart every 12 to 24 hours; the wart disappears in 2 to 3 weeks. Other methods of eradicating warts are cryosurgery, freezing

with liquid nitrogen, and electrodesiccation of the wart with an electric current followed by excision of the dead tissue. Venereal warts are further described in Chapter 52 ∞.

- **Herpes simplex.** Herpes simplex lesions are treated with topical acyclovir (Zovirax), an antifungal agent. Acyclovir shortens the time of symptoms and speeds healing.
- **Herpes zoster.** Antiviral drugs are used to treat herpes zoster infections. Acyclovir (Zovirax) interferes with viral synthesis and replication. Although it does not cure herpes infections, it does decrease the severity of the illness and also decreases pain. It may be administered topically, orally, or parenterally. It is more effective if administration begins within the first 1 to 2 days after the first vesicles appear. Other antiviral medications include famciclovir (Famvir) and valacyclovir (Valtrex). Nerve blocks may be needed to treat initial pain. Narcotic and nonnarcotic analgesics are prescribed for pain management, and antihistamines may be administered for relief of pruritus. Clients with eye involvement are treated with topical steroid ophthalmic ointments and mydriatics. Antivirals may sometimes be administered.

Zostavax, a shingles vaccine, is available to treat adults age 60 and over. The vaccine has been shown to prevent shingles approximately 50% of the time, thereby reducing incidence of the disease (WebMD, 2006).



## NURSING CARE

Clients with viral skin disorders require nursing care for infection, pruritus, and pain. They also require teaching about preventing the spread of the virus to others. Of the viral disorders, herpes zoster is the most painful and debilitating. See the following page for a Nursing Care Plan for the client with herpes zoster.

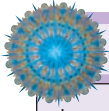
### Nursing Diagnoses and Interventions

This section discusses care of the client with herpes zoster, focusing on the nursing diagnoses of acute pain, disturbed sleep patterns, and risk for infection.

#### Acute Pain

The client with herpes zoster often experiences severe pain over the entire dermatome supplied by the affected nerve root. The pain is described as burning, tearing, or stabbing. The client may avoid movement and does not want clothing or bed linens to touch the affected area.

- Monitor the location, duration, and intensity of the pain. *Accurate assessment of the client's perception and tolerance of pain is essential in facilitating pain management.*
- Explain the rationale for taking prescribed medications on a regular schedule. *Delaying medications may allow the pain to reach an intensity at which the medication is less effective in promoting relief.*
- Teach measures to relieve pruritus:
  - Take prescribed antipruritic medications.
  - Apply calamine lotion or wet compresses, if prescribed.
  - Keep the room temperature cool.
  - Use a bed cradle to keep sheets off affected areas of the body.*Pruritus is a common problem for clients with herpes zoster; scratching may excoriate the skin and increase the risk for*



## NURSING CARE PLAN A Client with Herpes Zoster

Jesus Rivera is a 34-year-old migrant farm worker who currently lives in temporary housing in a rural area of the southwestern United States. His family includes his wife, Marta, who is 3 months' pregnant, and two children, ages 3 and 5. He takes his wife to a medical clinic staffed by volunteer nurses, physicians, and students from a nearby university for a prenatal checkup. The clinic is open only on Saturday and provides care on a sliding fee scale or for free if the family is unable to pay. While Mrs. Rivera is being examined, Mr. Rivera asks the nurse to have someone look at some very painful blisters on his chest that developed about a week ago. He is afraid that exposure to pesticides has caused the sores.

### ASSESSMENT

Mr. Rivera speaks Spanish and is able to communicate only slightly in English. The initial assessment of Mr. Rivera is performed by Anita Mendez, a student nurse fluent in Spanish. Mr. Rivera's history reveals problems with lower back pain but no significant past medical illnesses. He is not aware of any allergies and cannot remember having had chickenpox as a child. Two years ago, both children were sick and had blisters on their bodies, and a friend told them it was chickenpox. Mrs. Rivera thinks she had chickenpox as a child.

Because Mr. Rivera has not had any medical care for several years, baseline laboratory tests are ordered to screen for any other illnesses. The complete blood count (CBC), blood chemistry, and urinalysis are all within normal limits.

Mr. Rivera says that he did not feel well for several days before the blisters appeared, having experienced chills and general achiness. He had not taken his temperature because the family does not own a thermometer. Current vital signs are as follows: T 99°F (37.2°C), P 74, R 22, and BP 148/88.

Physical examination of the trunk reveals a bandlike pattern of lesions across the left thorax. Some of the lesions are vesicles filled with serous fluid; others are darker in color and are oozing a light yellow drainage. The skin around the lesions is red and inflamed. Mr. Rivera complains of a severe, burning pain with itching across his chest. He is diagnosed with herpes zoster.

### DIAGNOSES

- *Risk for Infection* related to open oozing areas on the left thorax
- *Acute Pain* related to the presence of lesions and pruritus
- *Deficient Knowledge* of the cause of the skin disorder and recommended treatment
- *Anxiety* related to need to work in areas of pesticide application
- *Impaired Health Maintenance* related to limited access to health care due to transitory work conditions, and cultural and language barriers

### EXPECTED OUTCOMES

- Skin lesions will heal without evidence of a secondary infection.
- Limit exposure (as much as possible) to his wife and children and to persons with debilitating illnesses to prevent the spread of the virus.
- Obtain relief of pain and pruritus with the proper use of medications.
- Verbalize an understanding of the disease process and participate in the treatment plan.

- Obtain follow-up care.
- Make an appointment for a referral for information about occupational hazards.

### PLANNING AND IMPLEMENTATION

- Provide verbal and written instructions (in Spanish) for self-care:
  - Wear a clean cotton undershirt each day.
  - Trim the fingernails short, and keep the hands clean.
  - Wash the hands each time the area is touched.
  - Wash any soiled clothes or linens in hot water and soap.
  - Do not allow other family members to use your towels.
  - Take medications as prescribed for itching and pain.
  - Take the medicine for your sores every 4 hours, even during nighttime hours, for 7 days.
  - As much as possible, do not touch your wife and children until the sores are covered with scabs. Do not have sex with your wife while you have these sores.
- Teach how to take care of skin lesions:
  - Wear disposable gloves every time you do this treatment.
  - Wash the sores and the skin around them very gently with a soft washcloth and a mild soap.
  - Using your fingers, carefully rub the cream on the sores. Do this once every morning after breakfast and once every evening after supper.
  - Wash your hands carefully before and after each treatment.
- Make a follow-up appointment for the next week.
- Provide Mr. Rivera with the name and phone number of the Occupational Safety and Health Administration (OSHA) and recommend he call for an appointment to discuss his concerns about pesticides.

### EVALUATION

Mrs. Rivera explains how she has taken care of her husband, and Mr. Rivera is careful to describe how he has followed the nurse's instructions. The skin lesions are dry and crusty, with no new blister formation. Mr. Rivera says he has not called OSHA and is not sure that he will, but he thanks Miss Mendez for the phone number. The nurses make an appointment in 1 month for a prenatal checkup for Mrs. Rivera and for follow-up of Mr. Rivera's herpes zoster. Mr. Rivera promises to return if they are still living close enough to keep the appointment.

### CRITICAL THINKING IN THE NURSING PROCESS

1. Identify barriers to care present in this case study. How may nursing interventions promote healthcare delivery to disadvantaged populations?
2. Although most cases of herpes zoster are self-limiting, what further assessments and interventions might have been indicated had the lesions shown little improvement over time and/or the pain remained severe?
3. If Mr. Rivera is advised not to work until his lesions heal, the family may face economic and sociocultural hardships. Develop a plan of care for Mr. Rivera for the nursing diagnosis *Ineffective Role Performance*.

*See Evaluating Your Response in Appendix C.*

secondary infections. Pruritus may intensify the experience of pain. Lotions and cool, wet compresses are effective in decreasing the itch–scratch–itch cycle. Warmth and touch intensify pruritus.

- Encourage the use of distraction (such as music) or a specific relaxation technique (such as progressive muscle relaxation or deep breathing). *Noninvasive methods to relieve pain not only help the client manage the pain experience but also increase the effectiveness of pain medications.*

### Disturbed Sleep Pattern

The pain and pruritus of herpes zoster interfere with normal sleep patterns. Those responses often are more intense at night, probably as a result of decreased distraction.

- Use appropriate measures to relieve pain and pruritus. *Pain and pruritus interfere with normal sleep. Analgesics and noninvasive methods of relief may be necessary before the client prepares for sleep.*
- Maintain a cool environment and avoid heavy bed covering. *Heat and touch intensify pruritus. Pruritus stimulates scratching, which awakens the client. The client may then perceive the pain more acutely. A cycle is established that interferes with sleep.*

### Risk for Infection

Clients with herpes zoster have impaired skin integrity and pruritus with scratching and possible excoriation; moreover, they may be immunocompromised. All of these factors contribute to a high risk for secondary bacterial infection. In addition, the client is contagious to others who did not have chickenpox as children.

- Teach client the manifestations of infection:
  - Increased temperature
  - Increased redness, formation of pustules, and/or purulent drainage
- Monitor white blood cell count
- Assess lymph glands. *Secondary bacterial infections may occur in any client with impaired skin integrity; if the client is immunocompromised, the risk is even greater. Fever, changes in lesions or drainage, an increased white blood cell count, and lymph gland enlargement are manifestations of an infection.*
- Teach interventions to decrease the itch–scratch–itch cycle, thereby decreasing the possibility of excoriation (see discussion about nursing care of clients with pruritus and psoriasis, earlier in this chapter). *Excoriation from scratching provides an avenue for bacterial invasion.*
- Institute infection control procedures for clients who are hospitalized:
  - Maintain strict isolation for immunocompromised clients.
  - Wear gloves and gown if contact with lesions is likely.
  - Instruct pregnant women to avoid exposure until lesions have crusted over.

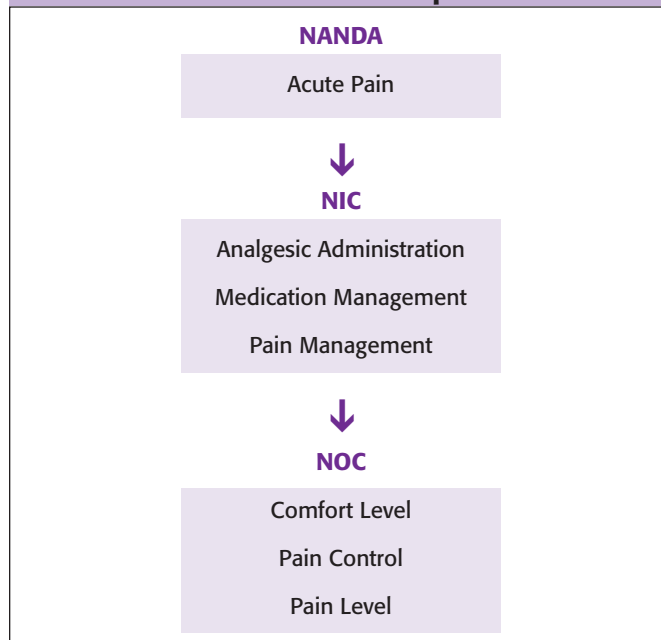
*Isolation procedures are instituted for the immunocompromised client to prevent client infection. Wear gloves and gown to prevent spreading the infection to self or others.*

### PRACTICE ALERT

Pregnant women must avoid exposure to people with herpes zoster because the herpesvirus can cross the placental barrier.

## NANDA, NIC, AND NOC LINKAGES

### CHART 16–1 The Client with Herpes Zoster



Data from *NANDA's Nursing Diagnoses: Definitions & Classification 2005–2006* by NANDA International (2005), Philadelphia; *Nursing Interventions Classification (NIC)* (4th ed.) by J. M. Dochterman & G. M. Bulechek (2004), St. Louis, MO: Mosby; and *Nursing Outcomes Classification (NOC)* (3rd ed.) by S. Moorhead, M. Johnson, and M. Maas (2004), St. Louis, MO: Mosby.

## Using NANDA, NIC, and NOC

Chart 16–1 shows links between NANDA, NIC, and NOC when caring for the client with herpes zoster.

## Community-Based Care

Because most clients with viral infections provide self-care at home, the nurse focuses on teaching the client and family how to provide the necessary care. With herpes zoster increasing in incidence in clients who are older or have a serious chronic illness, it may also be necessary to make a referral to a community health provider for continued support. Provide the following information and instructions:

- The diseases are usually self-limiting and heal completely. Second occurrences of herpes zoster are rare.
- Do not have social contact with children or pregnant women until crusts have formed over the blistered areas with herpes zoster, because the disease is contagious to people who have not had chickenpox.
- Use pain medications regularly.
- Follow suggestions to help reduce itching, scratching, and pain: Use medications as prescribed, wear lightweight cotton clothing, keep room temperatures cool, wear cotton gloves at night if scratching is a problem, and practice relaxation and distraction activities.
- Report any increase in pain, fever, chills, drainage that smells bad and has pus, or a spread in the blisters to your healthcare provider.



## INFLAMMATORY DISORDERS OF THE SKIN

The inflammatory skin disorders discussed in this section include dermatitis, acne, pemphigus, lichen planus, and toxic epidermal necrolysis.

### THE CLIENT WITH DERMATITIS

**Dermatitis** is an inflammation of the skin characterized by erythema and pain or pruritus. Dermatitis may be acute or chronic.

#### Pathophysiology

In dermatitis, various exogenous and endogenous agents cause an inflammatory response of the skin. Different types of skin eruptions occur, often specific to the causative allergen, infection, or disease. The initial skin responses to these agents or illnesses include erythema, formation of vesicles and scales, and pruritus (Figure 16–12 ■). Subsequently, irritation from scratching promotes edema, a serous discharge, and crusting. Long-term irritation in chronic dermatitis causes the skin to become thickened and leathery and darker in color.

#### Contact Dermatitis

Contact dermatitis is a type of dermatitis caused by a hypersensitivity response or chemical irritation. The major sources known to cause contact dermatitis are dyes, perfumes, poison plants (ivy, oak, sumac), chemicals, and metals (Box 16–3). A contact dermatitis common in the healthcare field is latex (glove) dermatitis.

#### FAST FACTS

##### Latex Allergy

- The increased use of latex gloves among healthcare providers has resulted in increased reporting of latex allergies. It is estimated that 10% to 17% of healthcare providers are allergic to latex (Porth, 2005).
- The most common type of allergic response to latex gloves is type IV, T-cell-mediated contact dermatitis.
- Type I, IgE-mediated hypersensitivity, manifested by urticaria, rhinoconjunctivitis, asthma, or anaphylaxis, is far more serious than the T-cell-mediated type.
- All clients with a latex allergy should be treated in a latex-free environment.
- Healthcare providers with severe allergic responses to latex may have to seek a different type of employment.

Allergic contact dermatitis is a cell-mediated or delayed hypersensitivity to a wide variety of allergens. Sensitizing antigens include microorganisms, plants, chemicals, drugs, metals, or foreign proteins. On initial contact with the skin, the allergen binds to a carrier protein, forming a sensitizing antigen. The antigen is processed and carried to the T cells, which in turn become sensitized to the antigen. The first exposure is the sensitizing contact and the person does not experience manifestations, which then occur with subsequent exposures. The manifestations include erythema, swelling, and pruritic vesicles in the area of allergen contact. For example, a person hypersensitive to metal may have lesions under a ring or watch.



**Figure 16–12 ■** Dermatitis may be a response to allergens, infections, or chemicals. This client has contact dermatitis resulting from the metal salts in a ring.

Source: Biophoto Associates/Photo Researchers, Inc.

Irritant contact dermatitis is an inflammation of the skin from irritants; it is not a hypersensitivity response. Common sources of irritant contact dermatitis include chemicals (such as acids), soaps, and detergents. The skin lesions are similar to those seen in allergic contact dermatitis.

#### Atopic Dermatitis

Atopic dermatitis is an inflammatory skin disorder that is also called *eczema*. The exact cause is unknown, but related factors include depressed cell-mediated immunity, elevated IgE levels, and increased histamine sensitivity. The disorder is seen more often in children, but chronic forms persist throughout life.

Clients with atopic dermatitis have a family history of hypersensitivity reactions, such as dry skin, eczema, asthma, and allergic rhinitis. Although up to one-third of clients with atopic dermatitis also have food allergies, a positive correlation has not been found.

The dermatitis results when mast cells, T lymphocytes, monocytes, and other inflammatory cells are activated and release histamine, lymphokines, and other inflammatory media-

#### BOX 16–3 Common Causes of Contact Dermatitis

- |   |   |
|---|---|
| ■ Acids   | ■ Iodine  |
| ■ Alkalis: soaps, detergents, household ammonia, lye, cleaners                        | ■ Insecticides  |
| ■ Bromide   | ■ Fabrics: wool, polyester, dyes, sizing  |
| ■ Chlorine  | ■ Metal salts: calcium chloride, zinc chloride, copper, mercury, nickel, silver |
| ■ Cosmetics: perfumes, dyes, oils   | ■ Plants: ragweed, poison oak, poison sumac, poison ivy, pine                   |
| ■ Dusts of lime, arsenic, wood  | ■ Coloring agents   |
| ■ Hydrocarbons: crude petroleum, lubricating oil, mineral oil, paraffin, asphalt, tar | ■ Rubber products   |
|   | ■ Soot  |

tors. The immune response interacts with the allergen to create a chronic inflammatory condition. In the adult form of atopic dermatitis, characteristic lesions include chronic lichenification, erythema, and scaling, the result of pruritus and scratching. The lesions are usually found on the hands, feet, or flexor surfaces of the arms and legs (Figure 16–13 ■). Scratching and excoriation increase the risk of secondary infections, as well as invasion of the skin by viruses such as herpes simplex. Serum studies may find elevated eosinophil and IgE levels.

### Seborrheic Dermatitis

Seborrheic dermatitis is a chronic inflammatory disorder of the skin that involves the scalp, eyebrows, eyelids, ear canals, nasolabial folds, axillae, and trunk. The cause is unknown. This disorder is seen in all ages, from the very young (called “cradle cap”) to the very old. Clients taking methyldopa (Aldomet) for hypertension occasionally develop this disorder, and it is a component of Parkinson’s disease. Seborrheic dermatitis is also frequently seen in clients with AIDS.

The lesions are yellow or white plaques with scales and crusts. The scales are often yellow or orange and have a greasy appearance. Mild pruritus is also present. Diffuse dandruff with erythema of the scalp often accompanies the skin lesions.

### Exfoliative Dermatitis

Exfoliative dermatitis is an inflammatory skin disorder characterized by excessive peeling or shedding of skin. The cause is unknown in about half of all cases, but a preexisting skin disorder (such as psoriasis, atopic dermatitis, contact dermatitis, or seborrheic dermatitis) is found in a majority of the cases (McPhee et al., 2007). Reactions to medications, such as sulfonamides, account for 20% to 40% of cases. Certain cancers (such as lymphoma) may also cause exfoliative dermatitis.

Both systemic and localized manifestations may appear. Systemic manifestations include weakness, malaise, fever, chills, and weight loss. Scaling, erythema, and pruritus may be localized or involve the entire body. In addition to peeling of skin, the client may lose the hair and nails. Generalized exfoliative dermatitis may cause debility and dehydration. The impairment of skin integrity increases the risk for local and systemic infections.



**Figure 16–13** ■ Atopic dermatitis, or eczema, causes pruritus, resulting in lichenification, erythema, and scaling.

Source: NMSB/Custom Medical Stock Photo.

## INTERDISCIPLINARY CARE



The client with dermatitis is treated primarily with topical medications and therapeutic baths. If the dermatitis is due to hypersensitivity to an allergen, the client avoids exposure to environmental irritants and suspected foods. The client also discontinues as many medications as possible to determine whether the dermatitis is the result of a drug allergy.

### Diagnosis

The diagnosis is often based on the manifestations of the disorder, and on a history of exposure to a known allergen. Scratch tests and intradermal tests are used to identify a specific allergen.

### Medications

The medications used depend on the cause of the dermatitis and the severity of the manifestations. Minor cases are treated with antipruritic medications, whereas more severe cases are treated with oral antihistamines, oral and/or topical corticosteroids, and wet dressings. Topical anti-infectives may be prescribed if necessary.



## NURSING CARE

Nursing care of the client with dermatitis focuses primarily on providing information for self-care at home. The client is responsible for managing skin problems and requires education and support. Address the following topics:

- Medications and treatments do not cure the disease; they only relieve the symptoms.
- Dry skin increases pruritus, which stimulates scratching. Scratching may in turn cause excoriation, and excoriation increases the risk of infection.
- It may be necessary to change the diet or environment to avoid contact with allergens.
- When using steroid preparations, apply only a thin layer to slightly damp skin (e.g., after taking a bath).
- If occlusive dressings are necessary, a plastic suit may be used.
- When using oral corticosteroids, never abruptly stop taking the medication. Rather, follow instructions to taper the dosage gradually.
- Antihistamines cause drowsiness. When using these medications, avoid alcohol and use caution when driving or working around machinery.

## THE CLIENT WITH ACNE

**Acne** is a disorder of the pilosebaceous (hair and sebaceous gland) structure, which opens to the skin surface through a pore. The sebaceous glands, which empty directly into the hair follicle, produce sebum, a lipid substance. Sebaceous glands are present over the entire skin surface except the soles of the feet and the palms of the hands, but the largest glands are on the face, scalp, and scrotum. Sebum production is a response to direct hormonal stimulation by testicular androgens in men and adrenal and ovarian androgens in women.

### Pathophysiology

Acne may be noninflammatory or inflammatory. Noninflammatory acne lesions are primarily **comedones**, more commonly

called pimples, whiteheads, and blackheads. Whiteheads are pale, slightly elevated papules categorized as closed comedones. Blackheads are plugs of material that accumulate in the sebaceous glands. They are categorized as open comedones. The color is the result of the movement of melanin into the plug from surrounding epidermal cells. Inflammatory acne lesions include comedones, erythematous pustules, and cysts (Figure 16–14 ■). Inflammation close to the skin surface results in pustules; deeper inflammation results in cysts. The inflammation is believed to result from irritation from fatty acid constituents of the sebum and from substances produced by *Propionibacterium acnes* bacteria, both of which escape into the dermis when the follicular walls of closed comedones rupture.

Several forms of acne occur at different periods of the life span. The most common are acne vulgaris, acne rosacea, and acne conglobata.

### Acne Vulgaris

Acne vulgaris is the form of acne common in adolescents and young to middle adults. The actual cause of acne vulgaris is unknown. Possible causes include androgenic influence on the sebaceous glands, increased sebum production, and proliferation of the organism *Propionibacterium acnes*. Many factors once thought to cause acne vulgaris, including high-fat diets, chocolate, infections, and cosmetics, have been disproved (Porth, 2005).

#### FAST FACTS

##### Acne Vulgaris

- Acne vulgaris is the most common of all skin conditions.
- Twelve percent of women and 3% of men over the age of 25 have acne vulgaris, and the rate does not begin to decrease until after age 44 (McPhee et al., 2007). Scarring may be a sequela of the disease, or may result from picking and manipulating the comedones by the client.

Mild cases may involve only a few scattered comedones, but severe cases are manifested by multiple lesions of all types. Most acne vulgaris lesions form on the face and neck, but they also occur on the back, chest, and shoulders. Women in their 30s and 40s, often with no prior acne, may develop papular le-



**Figure 16–14 ■** Acne vulgaris lesions include comedones, erythematous pustules, and cysts.

Source: St. Bartholomew's Hospital/Photo Researchers, Inc.

sions on the chin and around the mouth. The lesions are usually mildly painful and may itch. The complications of acne vulgaris, especially in severe cases, are formation of cysts, pigment changes in persons with dark skin, severe scarring, and lowered self-concept from the skin eruptions.

### Acne Rosacea

Acne rosacea is a chronic type of facial acne that occurs more often in middle and older adults. The cause is unknown. The lesions of acne rosacea begin with erythema over the cheeks and nose. Other skin lesions may appear. Over years of time, the skin color changes to dark red, and the pores over the area become enlarged. The soft tissue of the nose may exhibit rhinophyma, an irregular bullous thickening.

### Acne Conglobata

Acne conglobata is a chronic type of acne of unknown cause that begins in middle adulthood. This type causes serious skin lesions. Comedones, papules, pustules, nodules, cysts, and scars occur primarily on the back, buttocks, and chest but may occur on other body surfaces. The comedones have multiple openings and a discharge that ranges from serous to purulent with a foul odor.

## INTERDISCIPLINARY CARE



The management of acne is similar, regardless of type. Because acne vulgaris is most common, the discussions of interdisciplinary and nursing care focus on that type. Treatment is based on the type and severity of the lesions.

### Diagnosis

The disease is diagnosed by the typical location and appearance of lesions. If the client has pustules, a culture of the drainage is performed to differentiate viral or bacterial dermatitis from acne.

### Medications

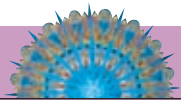
The treatment of acne is tailored to the individual and is based on the severity of the lesions. For acne with comedones, tretinoin (retinoic acid, Retin-A) or benzoyl peroxide preparations are prescribed. Azelaic acid (Azelex) may also be used. The administration of these vitamin A analogues is discussed in the Medication Administration box on the following page. Benzoyl peroxide preparations are found in OTC medications such as Fostex, Acne-Dome, Desquam-X, Benzagel, Clear By Design, and Xerac BP. These products are keratolytic and loosen the comedones.

Mild forms of papular inflammatory acne are treated with topical clindamycin (Cleocin T), a bacteriostatic agent that decreases the amount of fatty acids on the skin surface. This medication may be combined with tretinoin therapy.

Moderate forms of papular inflammatory acne are treated with oral or topical antibiotics, such as tetracycline, erythromycin, and minocycline. These antiacne antibiotics are administered for 3 to 4 months; if the client's skin is clear, the dose is lowered gradually to a maintenance dose that will maintain clear skin.

Severe forms of papular inflammatory acne are treated with isotretinoin (Accutane). This drug is effective, but has serious side effects. Isotretinoin, with nursing responsibilities, is discussed in the Medication Administration box on the next page.




**MEDICATION ADMINISTRATION Acne Medications**
**ANTIACNE RETINOIDS****Tretinoin (Retin-A) Isotretinoin (Accutane)**

Tretinoin is a vitamin A derivative classified as an acne agent. This topical agent acts as an irritant to decrease cohesiveness of follicular epithelial cells, thereby decreasing comedone formation while increasing the extrusion of comedones from the skin surface.

Isotretinoin is a vitamin A analogue classified as an acne product. It reduces the size of sebaceous glands, inhibits sebaceous gland differentiation to decrease sebum production, and alters sebum lipid composition.

**Nursing Responsibilities**

- Administer tretinoin with caution to pregnant women, because the effects of absorption on the developing fetus are not clearly defined.
- Isotretinoin is absolutely contraindicated for pregnant women or for women who want to become pregnant. The medication poses a high risk of major deformities in the infant if pregnancy occurs during use, even use that continues only for short periods.
- Do not administer to clients with eczema or to those who are hypersensitive to the sun.

**Health Education for the Client and Family****Tretinoin**

- Use the cream in a test area twice at night to test for sensitivity; if no reaction occurs, increase applications gradually to the prescribed frequency.
- A pea-sized amount of the cream is enough to cover the entire face.
- Apply the cream to clean, dry skin.
- Do not apply the cream to the eyes, mouth, angles of the nose, or mucous membranes.
- Wash your face no more than two to three times a day, using a mild soap. Do not use skin preparations (such as aftershave

lotion or perfumes) that contain alcohol, menthol, spice, or lime; they may irritate your skin.

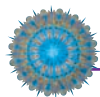
- The medication may cause a temporary stinging or warm sensation but should not cause pain.
- The skin where you apply the cream will be mildly red and may peel; if you experience a more severe reaction, consult your healthcare provider.
- The medication may cause increased sensitivity to sunlight, use sunscreens and wear protective clothing when outdoors.
- Your acne may become worse during the first 2 weeks of treatment; this is an expected response.

**Isotretinoin**

- Take the pills with food.
- Your acne may become worse during the initial period of treatment; this is an expected response.
- The medication causes dryness of the eyes, so you may have trouble wearing contact lenses during and after treatment.
- Do not take vitamin A supplements; they will increase the effects of the medication.
- Avoid prolonged exposure to sunlight; use sunscreen and protective clothing when in the sun.
- Notify the physician at once if you have abdominal pain, severe diarrhea, rectal bleeding, headache, nausea or vomiting, or visual disturbances.
- Do not drink alcohol while taking this medication (it causes an increase in triglycerides).
- Night vision may become worse; use caution when driving at night.
- Do not donate blood while, or for 1 month after, taking this medication.
- (For *female clients*) You must use two reliable forms of contraception simultaneously for at least 1 month before, during, and at least 1 month after therapy with this medication. The medication may cause deformities in a baby conceived at this time.

**Treatments**

Acne scars may alter the individual's self-concept. They may be removed by dermabrasion and laser treatment. Dermabrasion of inactive acne lesions can improve the client's appearance, especially if the scars are flat. (Dermabrasion is discussed in greater detail later in this chapter.) Laser excision of deep scars may also be performed.

**NURSING CARE**

Nursing care is individualized to the client's developmental needs and is conducted primarily through teaching in clinics or the home setting. Regardless of the client's age or gender, it is important to remember that almost all clients with acne are embarrassed by and self-conscious of their appearance. Prior to teaching, establish rapport with the client and clarify beliefs; for example, the client may believe the lesions result from poor hygiene, masturbation, use of cosmetics, eating the wrong types of foods, or lack of sexual activity. It is crit-

ical to teach the client about the causes of and factors involved in acne prior to teaching self-care.

The teaching plan for the client with acne includes general guidelines for skin care and health as well as specific guidelines for care of the acne lesions. The following topics should be addressed:

- Wash the skin with a mild soap and water at least twice a day to remove accumulated oils.
- Shampoo the hair often enough to prevent oiliness.
- Eat a regular, well-balanced diet. Foods do not cause or increase acne.
- Expose the skin to sunlight, but avoid sunburn.
- Get regular exercise and sleep.
- Try to avoid putting your hands on your face.
- Do not squeeze a pimple. Squeezing forces the material of the pimple deeper into the skin and may cause the pimple to become larger and infected.
- The treatment for acne lasts months, in some cases for the rest of one's life. It is very important to take the medications each day for the prescribed length of time.

## THE CLIENT WITH PEMPHIGUS VULGARIS

**Pemphigus vulgaris** is a chronic disorder of the skin and oral mucous membranes characterized by blister formation. The disease is caused by autoantibodies that cause acantholysis (the separation of epidermal cells from one another). The disorder is associated with IgG antibodies and HLA-A10 antigen. Sepsis from an infection of *Staphylococcus aureus* is the most common cause of death.

The disease occurs in middle and older adults of all races and ethnic backgrounds. The disorder has been associated with other autoimmune disorders and with the administration of certain drugs, such as penicillamine and captopril.

The blisters that form in pemphigus vulgaris usually appear first in the mouth and scalp and then spread in crops or waves to involve large areas of the body, including the face, back, chest, umbilicus, and groin. Blisters in the mouth ulcerate. The blisters form in the epidermis and cause the epidermal cells to separate above the basal layer. These blisters rupture, leaving denuded skin, crusting, and oozing of fluid with a musty odor. The lesions are painful. Pressure on a blister causes it to spread to adjacent skin (Nikolsky's sign). The loss of fluid from the blisters may result in fluid and electrolyte imbalances. Secondary bacterial infections are a serious risk.

### INTERDISCIPLINARY CARE



The goals of treatment are to control the severity of the disease, to prevent infection and loss of fluids, and to promote healing. Clients who experience severe attacks or secondary infections are usually hospitalized. Although the disease cannot be cured, the manifestations can be controlled.


#### Diagnosis

Pemphigus vulgaris is diagnosed by clinical manifestations and laboratory and diagnostic tests, including immunofluorescence microscopy, which is done to identify the presence of IgG antibodies in the epidermis and serum, and skin biopsy to determine the presence of acantholysis.

#### Medications

Early lesions are treated with highly potent topical corticosteroids. As the disease becomes more severe, systemic corticosteroids or immunosuppressive agents (such as azathioprine or methotrexate) are prescribed. Secondary infections are treated with topical and/or systemic antibiotics.

#### Treatments

Plasmapheresis is occasionally used to treat pemphigus. In this procedure, the plasma is selectively removed from whole blood and reinfused into the client. This decreases the serum level of antibodies for a period of time. Plasmapheresis with related nursing care is discussed in Chapter 46 .



### NURSING CARE

The hospitalized client with pemphigus requires careful assessment of skin lesions and monitoring for manifestations of infection. Provide skin care through bathing and applying dress-

ings to denuded areas, using aseptic technique to prevent infection. The client may be placed on reverse isolation as a protective measure. Monitor the client's hydration status to prevent fluid volume deficit and incorporate pain medications and non-invasive pain management techniques in the plan of care. Oral lesions often make eating difficult; the client requires meticulous oral hygiene and nonirritating foods. The client often is depressed and fearful; establishing a therapeutic relationship is essential, and referrals for counseling may be necessary.

Teaching the client and family how to provide care at home also involves skin care, oral care, diet, pain management, and prevention of infection. In addition, the nurse teaches the client and family how to take prescribed medications. A referral to a home health agency or local health department may be necessary.

## THE CLIENT WITH LICHEN PLANUS

**Lichen planus** is an inflammatory disorder of the mucous membranes and skin. It has no known cause but has been associated with exposure to drugs or to film processing chemicals. The disease affects adults from 30 to 70 years of age.

The lesions first appear as violet papules, 2 to 10 mm in size, commonly occurring on the wrists, ankles, lower legs, and genitals. The lesions itch intensely. Over time, persistent lesions thicken and become dark red, forming hypertrophic lichen planus. Lesions on the oral mucous membranes appear as white lacy rings; lesions may also appear on the mucous membranes of the vagina and the penis. The nails become thin and may shed.

Lichen planus lesions are self-limiting but last for an average of 12 to 18 months. The disorder is diagnosed by clinical manifestations. Corticosteroids are used to control the inflammation, and antihistamines are used to control the pruritus.

## THE CLIENT WITH TOXIC EPIDERMAL NECROLYSIS

**Toxic epidermal necrolysis (TEN)** is a rare, life-threatening disease in which the epidermis peels off the dermis in sheets, leaving large areas of denuded skin. Conjunctivitis and mucositis of the mouth, upper airway, esophagus, and sometimes the genitourinary tract are often associated with TEN. The client usually requires critical care, often in a burn center. The incidence of TEN has not been documented, but it is seen more often in men and in people of African descent. The mortality rate is decreasing because of current methods of care. The cause of death is almost always sepsis.

### Pathophysiology

Although some cases have no known cause, most cases result from a drug reaction, and others are associated with a serious concomitant illness, such as cancer or AIDS. Drugs that have been associated with TEN are the sulfonamides, barbiturates, NSAIDs, phenytoin, allopurinol, and penicillin.

The pathophysiologic process in TEN is not completely understood, but the triggering mechanism is believed to be a hypersensitivity or immune response. TEN begins with a painful, localized erythema of the face and extremities, accompanied by fever, chills, muscle aches, and generalized malaise. A macular rash develops, followed by the formation of large, flaccid blisters

over the body surface during the next 24 to 96 hours. The skin begins to slough, leaving the dermal surface exposed. Even in areas without blistering, the skin may peel off in layers. The skin sloughing continues over several days and can expose 95% or more of the dermal surface. Other manifestations include conjunctivitis, pharyngitis, stomatitis, and enlargement of lymph glands. Urethral slough is common, causing such painful voiding that the client voluntarily retains urine. The client is often disoriented, may be nearly comatose, and is seriously ill.

### Complications

The loss of skin leads to fluid and electrolyte imbalances and secondary infections, as well as systemic effects on all other body systems. These complications may cause death. However, if the

complications can be prevented, healing by epidermal regeneration occurs in about a month. The long-term complications of TEN include blindness, lacrimal duct occlusion, scarring and contractures, loss of nails, esophageal strictures, and glomerulonephritis.

## INTERDISCIPLINARY CARE



The client is hospitalized and requires rapid diagnosis and treatment. Any medication in use by the client is stopped immediately. Interdisciplinary care involves fluid replacement, correction of electrolyte imbalances, prevention or management of infection, and pain control. The interdisciplinary and nursing care are essentially the same as for the client with burns, discussed in Chapter 17 ∞.

## MALIGNANT SKIN DISORDERS

The skin is a common site for malignant lesions. Many of these lesions are found on skin surfaces that have undergone long-term exposure to the sun or the environment. Malignant skin tumors are the most common of all cancers.

### THE CLIENT WITH ACTINIC KERATOSIS

**Actinic keratosis**, also called senile or solar keratosis, is an epidermal skin lesion directly related to chronic sun exposure and photodamage. The prevalence is highest in people with light-colored skin; these lesions are rare in people with dark skin. Actinic keratosis may progress to squamous cell carcinoma. Fewer than 1% of early lesions become malignant, but many of those that persist progress to malignancy (Porth, 2005). Because of this tendency, the lesions are classified as premalignant.

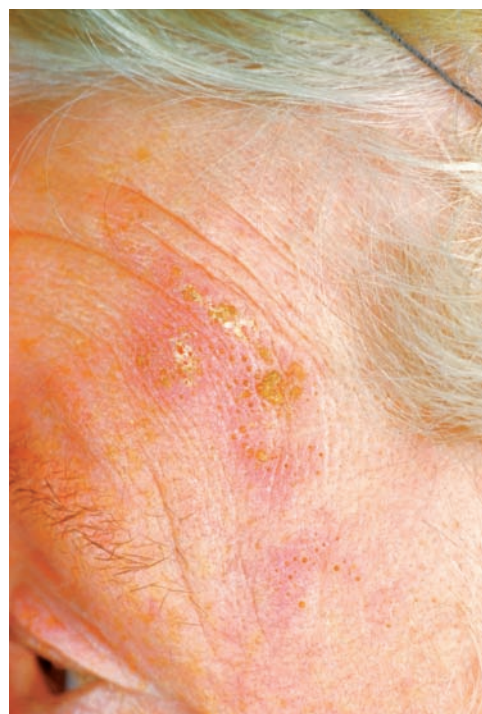
The lesions are erythematous rough macules a few millimeters in diameter. They are often shiny but may be scaly; if the scales are removed, the underlying skin bleeds. They occur in multiple patches, primarily on the face, dorsa of the hands, the forearms, and sometimes on the upper trunk (Figure 16–15 ■). Enlargement or ulceration of the lesions suggests transformation to malignancy.

### THE CLIENT WITH NONMELANOMA SKIN CANCER

The skin, despite its ability to protect the internal body from external damage, is a fragile organ and is subject to damage from ultraviolet radiation and chemicals. Over time, this damage results in alterations in cellular structure and function, and malignancies of the skin occur. The nonmelanoma skin cancers are basal cell cancer and squamous cell cancer.

### Incidence

Nonmelanoma skin cancer is the most common malignant neoplasm found in fair-skinned Americans. The American Cancer Society estimates that more than 1 million new cases of nonmelanoma skin cancer occur in the United States each year. Of that number 95% to 99% can be cured if detected and treated early. Men develop nonmelanoma skin cancer more often than do women, probably because of occupational exposures. Although nonmelanoma skin cancer can occur at any age, the incidence increases with each decade of life. Adults between the ages of 30 and 60 have the majority of these cancers.



**Figure 16–15 ■** The effects of long-term sun exposure are illustrated in this epidermal skin lesion, called actinic keratosis.

Source: Medical-On-Line Ltd.

### Risk Factors

Multiple etiologic factors are involved in the development of nonmelanoma skin cancer, including environmental factors and host factors.

#### FAST FACTS

##### Risk Factors for Nonmelanoma Skin Cancer

- Fair skin, freckles, blue or green eyes, and blond or red hair
- Family history of skin cancer
- Unprotected and/or excessive exposure to UV radiation (natural or artificial)
- Radiation treatment
- Occupational exposures to coal, tar, pitch, creosote, arsenic compounds, or radium
- Severe sunburns as a child



## Environmental Factors

The environmental factors implicated in the nonmelanoma skin cancers are ultraviolet radiation, pollutants, chemicals, ionizing radiation, viruses, and physical trauma.

Ultraviolet radiation (UVR) from the sun is believed to be the cause of most nonmelanoma skin cancers. Sunlight contains both short-length rays (UVB) and long-length rays (UVA). UVB rays are absorbed by the top layer of skin and cause sunburn. UVA rays penetrate deeper into the skin layers, causing tissue damage. Both types of rays are believed to cause DNA alterations and also suppress T-cell and B-cell immunity. The amount of UVR reaching the earth is increasing, most likely from depletion of the ozone layer surrounding the planet. The U.S. Environmental Protection Agency predicts that for every 1% decrease in the ozone layer, a corresponding 1% to 3% increase in nonmelanoma skin cancer per year will occur.

Geographic, environmental, and lifestyle factors affect the amount of exposure to the sun and the risk for nonmelanoma skin cancer. People who live in latitudes close to the equator and those who live at higher altitudes receive greater ultraviolet radiation exposure. The amount of clothing worn, the time of day, and the amount of time in the sun also determine the amount of exposure. Exposure to ultraviolet radiation in tanning booths has also been implicated in the development of nonmelanoma skin cancer.

Certain chemicals have long been associated with nonmelanoma skin cancer. Polycyclic aromatic hydrocarbons, found in mixtures of coal, tar, asphalt, soot, and mineral oils, have been linked with skin cancers. Psoralens, used in conjunction with UVA for treatment of psoriasis and cutaneous T-cell lymphoma, increase the risk of squamous cell cancer.

Other factors associated with nonmelanoma skin cancer are the use of ionizing radiation, viruses, and physical trauma. X-ray therapy for tinea capitis and the use of radium to treat other malignancies are risk factors. Human papillomavirus is implicated in the development of squamous cell cancer, as is damage to the skin from burns.

## Host Factors

Certain host factors increase the risk of nonmelanoma skin cancer. These include skin pigmentation as well as the presence of premalignant lesions.

Skin pigmentation is an important factor in the development of nonmelanoma skin cancer. The amount of melanin pigment produced by the melanocytes determines a person's skin color. The more melanin, the more the skin is protected from the damage produced by ultraviolet rays. Thus, African Americans, Asian Americans, and people of Mediterranean descent have a much lower incidence of nonmelanoma skin cancer than do people who have fair complexions and tend to freckle or sunburn easily, such as people of Irish, Scandinavian, or English ancestry.

Although most people have numerous pigmented lesions on their body, almost all of these are normal. However, a major risk factor in the development of nonmelanoma skin cancer is a change in an existing lesion or the presence of a premalignant lesion, such as actinic keratosis. Organ transplant recipients who undergo immunosuppression to prevent rejection are also at risk for the development of squamous cell cancer.

## Pathophysiology

Basal cell cancer and squamous cell cancer arise from epithelial tissue but have different pathophysiology, classifications, and manifestations.

### Basal Cell Cancer

**Basal cell cancer** is an epithelial tumor believed to originate either from the basal layer of the epidermis or from cells in the surrounding dermal structures. These tumors are characterized by an impaired ability of the basal cells of the epidermis to mature into keratinocytes, with mitotic division beyond the basal layer. This results in a bulky neoplasm that grows by direct extension and destroys surrounding tissue, including healthy skin, nerves, blood vessels, lymphatic tissue, cartilage, and bone. Basal cell cancer is the most common but least aggressive type of skin cancer, rarely metastasizing.

Basal cell cancers tend to recur. Tumors greater than 2 cm in diameter have a high recurrence rate. Predisposing factors for metastasis are the size of the tumor and the client's resistance to treatment with surgery or chemotherapy. Even though they rarely metastasize, untreated basal cell cancers invade surrounding tissue and may destroy body parts, such as the nose or eyelid.

Basal cell cancer is classified into different types: nodular, superficial, pigmented, morpheaform, and keratotic. These types are described below and are summarized in Table 16–3.

Nodular basal cell cancer, the most common type of basal cell cancer, most often appears on the face, neck, and head. The tumor is made up of masses of cells that resemble epidermal basal cells and grow in a bulky, nodular form from lack of keratinization. In early stages, the tumor is a papule that looks like a smooth pimple. It is often pruritic and continues to grow at a steady rate, doubling in size every 6 to 12 months. As the tumor grows, the epidermis thins, but it remains intact. The skin over

**TABLE 16–3 Types and Characteristics of Basal Cell Cancers**

TYPE	COMMON LOCATION	MANIFESTATION
Nodular	Face, neck, head	Small, firm papule; pearly, white, pink, or flesh colored; telangiectasis; enlarges; may ulcerate.
Superficial	Trunk, extremities	Papules or plaque that is flat, erythematous, or scaling; pink color; well-defined borders; may have shallow erosions and surface crusting.
Pigmented	Head, neck, face	Dark brown, blue, or black color; border is shiny and well defined.
Morpheaform	Head, neck	Looks like a flat scar; ivory or flesh colored.
Keratotic	Ear	Small, firm papule; pearly, white, pink, or flesh colored; may ulcerate.

the tumor is shiny, and either pearly white, pink, or flesh colored. Telangiectasis may be visible over the area of the tumor. As the tumor continues to increase in size, the center or periphery may ulcerate, and the tumor develops well-circumscribed borders. It bleeds easily from mild injury.

Superficial basal cell cancer, found most often on the trunk and extremities, is the second most common type of basal cell cancer. This tumor is a proliferating tissue that attaches to the undersurface of the epithelium. The tumor is a flat papule or plaque, often erythematous, with well-defined borders. The tumor may ulcerate and be covered with crusts or shallow erosions (Figure 16–16 ■).

Pigmented basal cell cancer, found on the head, neck, and face, is less common. This tumor concentrates melanin pigment in the center of the basal cancer cells, giving it a dark brown, blue, or black appearance. The border of the tumor is shiny and well defined.

Morpheaform basal cell cancer, the rarest form of basal cell cancer, usually develops on the head and neck. The tumor forms finger-like projections that extend in any direction along dermal tissue planes. The tumor resembles a flat ivory or flesh-colored scar. This form is more likely to extend into and destroy adjacent tissue, especially muscle, nerve, and bone. It is often more difficult to diagnose because of its appearance.

Keratotic basal cell cancer (basosquamous) is found on the preauricular and postauricular groove. It contains both basal cells and squamoid-appearing cells that keratinize. Its appearance is much like that of nodular basal cell cancer. This type of basal cell cancer tends to recur locally and also is the type most likely to metastasize.

## Squamous Cell Cancer

**Squamous cell cancer** is a malignant tumor of the squamous epithelium of the skin or mucous membranes. It occurs most often on areas of skin exposed to ultraviolet rays and weather, such as the forehead, helix of the ear, top of the nose, lower lip, and back of the hands. Squamous cell cancer may also arise on skin that has been burned or has chronic inflammation. This is a much more aggressive cancer than basal cell cancer, with a faster growth rate and a much greater potential for metastasis if untreated.



**Figure 16–16 ■** A superficial basal cell cancer is characterized by erythema, ulcerations, and well-defined borders.

Source: From American Academy of Dermatology. Reprinted with permission. All rights reserved.



**Figure 16–17 ■** As a squamous cell cancer grows, it tends to invade surrounding tissue. It also ulcerates, may bleed, and is painful.

Source: From American Academy of Dermatology. Reprinted with permission. All rights reserved.

The tumors arise when the keratinizing cells of the squamous epithelium proliferate, producing a growth that eventually fills the epidermis and invades the dermal tissue planes. Keratinization of some cells is present, and the formation of keratin “pearls” is common. The keratin formation diminishes as the tumor grows. As the tumor grows, the tumor cells increase in number and rate of mitosis, forming odd shapes.

Squamous cell cancer begins as a small, firm red nodule. The tumor may be crusted with keratin products. As it grows, it may ulcerate, bleed, and become painful. As the tumor extends into the surrounding tissue and becomes a nodule, the area around the nodule becomes indurated (hardened) (Figure 16–17 ■).

Recurrent squamous cell cancer can be invasive, increasing the risk of metastasis. Invasive squamous cell cancer may arise from preexisting skin lesions, such as scars and actinic keratosis, and extend into the dermis (called intraepidermal squamous cell cancer). This form appears as a slightly raised erythematous plaque with well-defined borders. Metastasis occurs most often via the lymphatics. The degree of risk for metastasis depends on the size and depth of penetration of the tumor.

## INTERDISCIPLINARY CARE



Treatment of nonmelanoma skin cancer focuses on removal of all malignant tissue using such methods as surgery, curettage and electrodesiccation, cryotherapy, or radiotherapy. These modalities offer a greater than 90% cure rate. After the malignant tissue is removed, the client should have regular examinations for recurrence.

### Diagnosis

Nonmelanoma cancer is diagnosed by microscopic examination of tissue biopsied from the tumor. The biopsy is usually done as an office procedure under local anesthesia. The types of biopsy used are shave, punch, incisional, and excisional. See Chapter 15 ∞ for further information.

### Treatments

Depending on the type, size, and location of a nonmelanoma cancer, it may be treated with surgical excision, Mohs surgery, curettage and electrodesiccation, or radiation.

**SURGICAL EXCISION** Both basal cell and squamous cell cancers are excised surgically. The surgery may be minor or major, depending on the size and location of the tumor. Surgery for small tumors is most often performed in the outpatient surgery department or in the surgeon's office. Surgical excision allows rapid healing and yields good cosmetic results, but, as with any surgery, carries the risk of infection.

The goal of surgical excision is to remove the tumor completely, so some surrounding tissue is excised along with the tumor. If the tumor is on the face, the incision is made along normal wrinkle or anatomic lines so that the scars will be less obvious. The incision is closed in layers to leave the smallest possible scar. A pressure dressing is usually applied over the incision to provide support.

If a large tumor is removed, a skin graft or skin flap may be performed to cover the excised area. If grafting is necessary, the client is hospitalized.

**MOHS SURGERY** In Mohs surgery, thin layers of the tumor are horizontally shaved off. A frozen section of the tissue is stained at each level to determine tumor margins. This method is the most accurate in assessing the extent of nonmelanoma skin cancer and the method that conserves the most normal tissue. It is often used in areas such as the nose, the nasolabial fold, the medial canthus, and the ear.

**CURETTAGE AND ELECTRODESICCATION** Curettage and electrodesiccation are used to treat basal cell cancers that are less than 2 cm in diameter, are superficial, or recur because of poor margin control. They may also be used for primary squamous cell cancers that are less than 1 cm in diameter and have distinct borders. This type of treatment is most successful for tumors on anatomic sites over a fixed underlying surface, such as the ear, chest, and temple.

Abnormal tissue is scraped away (curettage) within 1 to 2 mm of the margin and then a low-voltage electrode is used to abrade the tumor base (electrodesiccation). Tumor tissue is much softer and more friable than normal tissue. Therefore, curettage and electrodesiccation is not used for lesions where the dermis is thin (such as the eyelid) or where the tumor extends into the subcutaneous tissue.

Curettage and electrodesiccation provide good cosmetic results and preserve normal tissue. However, healing time is longer, and it is difficult to ensure that all tumor margins have been removed.

Instead of a low-voltage electrode, some physicians use a carbon dioxide laser to vaporize the tumor. When used in conjunction with curettage, this treatment is effective on superficial basal cell cancers. Carbon dioxide vaporization results in minimal thermal injury to adjacent cells, less pain, and quicker healing.

**RADIATION THERAPY** Radiation is most often used for lesions that are inoperable because of their location (such as tumors on the corner of the nose, the eyelid, the canthus, and the lip) or size (between 1 and 8 cm). Radiotherapy is also used for clients who are older or of poor surgical risk. Radiation is painless and can be used to treat areas surrounding the tumor if necessary. However, the treatment is given over 3 to 4 weeks in a clinical facility, does not allow control of tumor margins, and may itself cause skin cancer.



## NURSING CARE

The increasing number of people with skin cancer means that nurses must be involved in prevention and early detection. Nurses have the opportunity to teach preventive behaviors in all settings, including the hospital, home, community, school, and clinic.

Nursing care for the client with nonmelanoma skin cancer depends on the treatment used. Surgical excision is the most common form of treatment; nursing care depends on the extent of the procedure. However, regardless of the type of treatment, the client will have impaired skin integrity, an increased risk for infection, and anxiety about the future following a diagnosis of cancer. Interventions with rationales for the client with any type of skin cancer are discussed in the following section on malignant melanoma.

## Health Promotion

It is well known that cumulative sun exposure positively correlates with nonmelanoma skin cancers. Many skin cancers can be prevented by limiting exposure to risk factors. Primary prevention behaviors recommended by the American Cancer Society and the Skin Cancer Foundation are outlined in Box 16–4. Information about sunscreens is listed in Box 16–5.

Nurses also provide client and family education for early detection of nonmelanoma skin cancer. Numerous brochures describing the types of skin cancers, photographs of lesions, and prevention behaviors are available from the American Cancer Society, health education and support agencies, and pharmaceutical companies that manufacture sunscreen. Most of this literature is free.

The client or family at risk for or diagnosed with a skin cancer must be taught how to conduct a self-examination of the skin, described in Box 16–6, as well as the importance of conducting the examination on the same day of each month. Family members can help with areas that are hard to examine, such as the ears, scalp, and back.

### BOX 16–4 Preventing Skin Cancer

- Minimize sun exposure between the hours of 10 A.M. and 3 P.M., when ultraviolet rays are the strongest.
- Cover up with a wide-brimmed hat, sunglasses, long-sleeved shirt, and long pants made of tightly woven materials when in the sun.
- Apply a waterproof or water-resistant sunscreen with an SPF of 15 or higher at least 30 minutes before every exposure to the sun. If swimming or sweating heavily, reapply every hour. Apply sunscreen not only on sunny days but also on cloudy days (when ultraviolet rays can penetrate 70% to 80% of the cloud cover).
- Use sunscreen and protective clothing when you are on or near sand, snow, concrete, or water (which can reflect more than 50% of the ultraviolet rays onto your skin).
- Avoid tanning booths; ultraviolet radiation emitted by tanning booths damages the deep skin layers.



**BOX 16–5 Sunscreen Information****Types of Sunscreen****Chemical**

Chemical sunscreens absorb ultraviolet light and act as a radiation filter. Examples follow:

- *p*-Aminobenzoic acid (PABA)      ■ Anthranilates
- Benzophenones                              ■ Salicylates

**Physical**

Physical sunscreens reflect and scatter ultraviolet light. Examples follow:

- Zinc oxide                                      ■ Ferric chloride
- Titanium dioxide                              ■ Kaolin
- Magnesium silicate                              ■ Ichthyol

**Adverse Reactions Associated with Sunscreens**

Adverse reactions associated with sunscreens include contact and photocontact dermatitis. People with previous hypersensitivity reactions to benzocaine, procaine, sulfonamides, or paraphenylenediamine may develop hypersensitivity responses to PABA. People who are also taking systemic thiazide diuretics or sulfonamides may develop eczematous dermatitis.

**Sunscreen Ratings**

In the United States, the Food and Drug Administration rates commercial sunscreens according to their sun protection factor, or SPF. The SPF value is the ratio of the time required to produce minimal skin redness through a sunscreen product with the time required to produce the same degree of redness without the sunscreen. A person who can tolerate 1/2 hour of sun without a sunscreen should be able to tolerate 3 hours of sun when a sunscreen of SPF 6 is applied to the skin. SPF values of sunscreens range from 2 to 50.

**Community-Based Care**

Teach the client and family specific measures for self-care following surgery, including information about:

- How and when to change dressings
- The use of aseptic technique and careful hand washing when caring for the wound
- Symptoms to report (such as bleeding, fever, or signs of wound infection), and how to protect the operative site against trauma and irritations.

**THE CLIENT WITH MALIGNANT MELANOMA**

**Malignant melanoma** arises from melanocytes. This serious skin cancer is increasing in incidence each year. Melanoma accounts for about 4% of skin cancers, but it causes about 79% of skin cancer deaths (American Cancer Society, 2004b).

**Incidence**

This disease is more than 10 times more common in fair-skinned people than in dark-skinned people. As with the nonmelanoma skin cancers, an increase in the incidence of malignant melanoma is believed to be related to the thinning ozone layer and increased exposure to ultraviolet rays. The incidence is highest in Caucasian

**BOX 16–6 Skin Self-Examination**

1. Choose the same day each month (such as the first day) to do the examination.
2. The best time to do the examination is after you take a bath or shower. Examine yourself in a well-lighted room in front of a full-length mirror. Have a hand mirror, a chair, and a hair dryer available. If you have difficulty seeing your back and scalp (or any other parts of your body), ask someone to help you.
3. Follow the same pattern with each examination:



Examine head and face, using one or both mirrors. Use blow dryer to inspect scalp.

Check hands, including nails. In full-length mirror, examine elbows, arms, underarms.



Focus on neck, chest, torso. Women: Check under breasts.

With back to the mirror, use hand mirror to inspect back of neck and back including buttocks.



Sitting down, check legs and feet, including soles, heels, and nails. Use hand mirror to examine genitals.

upper-middle-class professionals who work indoors. This group of people often had severe sunburn with blistering during childhood and tend to vacation in areas of intense sun exposure. Malignant melanoma is also more common in people who live in sunny climates, burn easily, and patronize tanning parlors. However, malignant melanoma may arise from already present lesions or from skin normally covered with clothing.

## Risk Factors

Although the exact cause of melanoma is unknown, it is known that certain risk factors are associated with the disease. The risk factors for melanoma are listed in Box 16–7.

## Pathophysiology

Malignant melanomas arise from melanocytes, cells located at or near the basal layer (the deepest epidermal layer). These cells produce melanin, the dark skin pigment. Melanin is made in granules and transferred to keratinocytes, where it accumulates on the superficial side of each keratinocyte and forms a shield of pigment over the nucleus as protection against ultraviolet rays. Malignant melanomas can develop wherever there is pigment, but about one-third of them originate in existing nevi (moles).

Almost all malignant melanomas are more than 6 mm in diameter, are asymmetric, and initially develop within the epidermis over a long period. While they are still confined to the epidermis, the lesions (called malignant melanoma *in situ*) are flat and relatively benign. However, when they penetrate the dermis, they mingle with blood and lymph vessels and are capable of metastasizing. At this latter stage, the tumors develop a raised or nodular appearance and often have smaller nodules, called satellite lesions, around the periphery.

The prognosis for survival for people diagnosed with malignant melanoma is determined by several variables, including tumor thickness, ulceration, metastasis, site, age, and gender. Younger clients and women have a somewhat better chance of survival. Tumors on the hands, feet, and scalp have a poorer prognosis; tumors of the feet and scalp are less visible and may not be diagnosed until they grow into the dermis.

### Precursor Lesions

The three specific precursor lesions for the development of malignant melanoma are congenital nevi, dysplastic nevi, and lentigo maligna. A precursor lesion is also called a premalignant lesion, a name that indicates that the lesion's risk of becoming malignant is greater than normal.

**CONGENITAL NEVI** Congenital nevi are present at birth. Some lesions are small; others are large enough to cover an entire body area. Their color can range from brown to black.

### BOX 16–7 Risk Factors for Melanoma Skin Cancer

- A high number of moles, or large moles
- Fair skin, freckling, blond hair, or blue eyes
- Close relative with the disease
- Men with gene changes from a family history of breast or ovarian cancer
- Treatment with medications that suppress the immune system
- Too much exposure to UV radiation from sunlight, tanning lamps, or tanning booths
- Over age 50
- Xeroderma pigmentosus, a rare inherited disease in which people are less able to repair damage caused by sunlight
- Past history of melanoma

They are often slightly raised, with an irregular surface and a fairly regular border.

**DYSPLASTIC NEVI** Dysplastic nevi are also called atypical moles. Although dysplastic nevi are not present at birth, they appear as normal nevi during childhood and become dysplastic (having abnormal development) after puberty. A client with classic dysplastic nevi has more than 100 nevi, at least one of which is larger than 8 mm in diameter, and at least one has the characteristics of malignant melanoma (asymmetry, irregular border, color variegation, and a diameter greater than 6 mm). A familial tendency to dysplastic nevi increases the risk for the development of malignant melanoma. However, it is not known whether people with dysplastic nevi and no family history of melanoma face a higher risk of melanoma.

Dysplastic nevi most often appear on the face, trunk, and arms but also are seen on the scalp, female breast, groin, and buttocks. The pigmentation of the nevi is irregular, with mixtures of tan, brown, black, red, and pink. An area of lighter pigmentation is surrounded by a papular area of deeper pigmentation (described as a “fried egg appearance”). The borders of the nevi are irregular.

**LENTIGO MALIGNA** Lentigo maligna, also called Hutchinson's freckle, is a tan or black patch on the skin that looks like a freckle. It grows slowly, becoming mottled, dark, thick, and nodular. It is usually seen on one side of the face of an older adult who has had a large amount of sun exposure.

### Classification

Malignant melanomas are classified into different types. The major types are superficial spreading melanoma, lentigo maligna melanoma, nodular melanoma, and acral lentiginous melanoma. Each of these tumors is characterized by a radial and/or vertical growth phase. During the initial radial phase, which may last from 1 to 25 years (depending on the type), the melanoma grows parallel to the skin surface. During this phase, the tumor rarely metastasizes and is often curable by surgical excision. However, during the vertical growth phase, atypical melanocytes rapidly penetrate into the dermis and subcutaneous tissue, greatly increasing the risk for metastasis and death.

**SUPERFICIAL SPREADING MELANOMA** Superficial spreading melanoma is the most common type, comprising about 70% of all melanomas (Porth, 2005). The lesions are usually flat and scaly or crusty and are about 2 cm in diameter. They often arise from a preexisting nevus. This type of melanoma is found on the trunk and back of men and on the legs of women. Superficial spreading melanomas occur more often in women than in men. The median age of occurrence is the 50s.

The radial growth phase lasts from 1 to 5 or more years. When the lesion enters the vertical growth phase, it grows rapidly, and its color changes from a mixture of tan, brown, and black to a characteristic red, white, and blue. The lesion also develops irregular borders and often has raised nodules and ulcerations (Figure 16–18 ■).

**LENTIGO MALIGNA MELANOMA** Lentigo maligna melanoma often arises from the precursor lesion, lentigo maligna. The lesions are large and tan with different shades of brown. This type



**Figure 16–18** ■ Malignant melanoma is a serious skin cancer that arises from melanocytes.

Source: L. Solomon/Custom Medical Stock Photography.

of melanoma makes up 4% to 10% of malignant melanomas and is the least serious form (Porth, 2005). It occurs on skin that has had long-term sun exposure, such as the face, neck, and sometimes the dorsal surface of the hands and lower extremities. Lentigo maligna melanoma affects women more than men. It is typically diagnosed in people in their 60s and 70s.

Lentigo maligna melanoma is characterized by a proliferation of atypical melanocytes parallel to the basal layer of the epidermis. The radial growth phase may last from 10 to 25 years, with the lesion growing to as large as 10 cm. The lesion becomes malignant as soon as the melanocytes invade the dermis. In the vertical growth phase, raised nodules may appear on the surface of the lesion. The lesion tends to acquire a freckled or mottled appearance.

**NODULAR MELANOMA** Nodular melanoma lesions are raised, dome-shaped, blue-black or red nodules on areas of the head, neck, and trunk that may or may not have been exposed to the sun. The lesions may look like a blood blister, or they may ulcerate and bleed. The lesions arise from unaffected skin rather than from a preexisting lesion. This type makes up 15% to 30% of malignant melanomas and is often diagnosed in people in their 50s (Porth, 2005).

Nodular melanoma has only a vertical growth phase, but it grows aggressively during that phase. However, the absence of a radial growth phase makes this type more difficult to diagnose before it metastasizes.

**ACRAL LENTIGINOUS MELANOMA** Acral lentiginous melanoma, also called mucocutaneous melanoma, is less common in people with fair skin and more common in people with dark skin. The lesions progress from tan, brown, or black flat lesions to elevated nodules and are about 3 cm in diameter. The radial phase lasts from 2 to 5 years. They are found on the palms of the hands, soles of the feet, the mucous membranes, and the nail beds. Acral lentiginous melanoma affects both men and women equally and is most often diagnosed in people in their 50s and 60s.

## INTERDISCIPLINARY CARE

The management of the client with malignant melanoma begins with identification, diagnosis, and tumor staging. If treat-

able, the tumor is removed through surgical excision. Malignant melanoma is also treated with chemotherapy, immunotherapy, and radiation therapy. Other therapies used with success include biologic therapies with interleukin-2 and interferon and therapeutic vaccines containing melanoma antigens.

### Identification

Malignant melanoma is most often found on the trunk of men and on the lower extremities of women. Nevertheless, it is important for the client to have a complete physical examination and total skin assessment. In addition to a visual examination of all skin surfaces, palpation of regional lymph nodes, the liver, and the spleen is essential to assess for metastasis when a melanoma is suspected or found.

A change in the color or size of a nevus is reported in 70% of people diagnosed with a malignant melanoma. The ABCD rule is used to assess suspicious lesions.

### FAST FACTS

#### The ABCD Rule

Using the ABCD rule to assess for melanoma:

- A = asymmetry (one half of the nevus does not match the other half)
- B = border irregularity (edges are ragged, blurred, or notched)
- C = color variation or dark black color
- D = diameter greater than 6 mm (size of a pencil eraser)

### Diagnosis

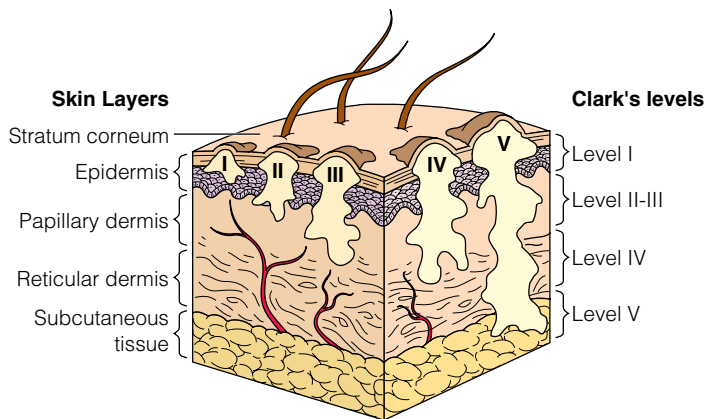
In addition to biopsy of any suspicious lesion, diagnostic tests are conducted to determine whether the tumor has metastasized. Because malignant melanoma may metastasize to any organ or tissue of the body, a variety of tests may be conducted, including microscopic examination, biopsy, and tests for metastasis (liver function tests and computed tomography [CT] scan of the liver, a complete blood count, serum blood chemistry profile, chest x-ray, bone scan, and CT scan or magnetic resonance imaging of the brain).

### Microstaging

The term *microstaging* describes the assessment of the level of invasion of a malignant melanoma and the maximum tumor thickness. In the Clark system of microstaging, the vertical growth of the lesion is measured from the epidermis to the subcutaneous tissue to determine the level of invasion (Figure 16–19 ■). However, variations in individual skin thicknesses and different anatomic sites can affect the accuracy of the measurement. In the Breslow system, an adaptation of the Clark system of assessment, the vertical thickness is measured from the granular level of the epidermis to the deepest level of tumor invasion. This determination is important, because as the thickness of the melanoma increases, survival rate decreases.

After the thickness and depth of the tumor are determined, a clinical stage is assigned. The traditional three-stage system is still used, although it does not include tumor thickness. The American Joint Committee on Cancer has adopted a four-stage system that includes tumor thickness, level of invasion, lymph node involvement, and evidence of metastasis.





**Figure 16–19** ■ Clark's levels for staging measure the invasion of a melanoma from the epidermis to the subcutaneous tissue.

## Treatments

Surgical excision is the preferred treatment for malignant melanoma. Other methods of treatment are chemotherapy, immunotherapy, and radiation therapy.

**SURGERY** If a biopsy identifies the lesion as a melanoma, a wide excision is performed that includes the full thickness of the skin and subcutaneous tissue. Because the risk of local recurrence for thin melanomas (those less than 0.76 mm) is quite low, margins of 0.5 to 1.0 cm of normal skin are excised around the tumor. Thick tumors require a 1- to 3-cm margin excision because they are at risk for local recurrence or satellite lesions.

Regional lymph nodes are the most common sites for metastasis of malignant melanoma. Standard surgical treatment for clinically suspicious lymph node involvement includes excision of the primary lesions as well as surgical dissection of the involved lymph nodes. Elective lymph node dissection (ELND) in the treatment of localized malignant melanoma remains controversial. Advocates of ELND believe that the procedure benefits clients with intermediate-thickness tumors because approximately 20% of people whose lymph nodes were clinically negative at diagnosis show some metastasis on removal of the nodes. Those opposed to ELND believe the risks associated with the procedure are too high for the 80% of people who have no evidence of metastasis after removal of the nodes.

Surgery also is indicated for palliative management of isolated metastasis. Removal of metastatic tumors in the brain, liver, lung, gastrointestinal tract, or subcutaneous tissue may relieve symptoms and prolong life.

**IMMUNOTHERAPY** Immunotherapy is a relatively new treatment modality for malignant melanoma. The role of the immunologic response initially was recognized because of the numerous spontaneous remissions seen in clients with melanoma—a higher occurrence than with any other adult tumor. In addition, researchers have recently identified tumor-specific antigen-antibodies in clients with melanoma. This also has stimulated an interest in immunotherapeutic interventions for the treatment of malignant melanoma.

Agents such as interferons, interleukins, monoclonal antibodies, bacille Calmette-Guérin, levamisole, transfer factors, and tumor vaccines have been used to treat melanoma, with varying response rates. The effectiveness of these agents, used either alone, in combination with chemotherapy, or in combination with each other, is under investigation.

**RADIATION THERAPY** Melanoma responds to higher dose radiation, especially if the tumor is small. Response rates to radiation therapy depend on the site of the tumor, the thickness of the tumor, the type of melanoma, and the client's general health, but may range from 0% to 71%. Radiation frequently is used for palliation of symptoms resulting from metastasis to the brain, bone, lymph nodes, gastrointestinal tract, skin, or subcutaneous tissue. Liver and lung metastases are not treated with radiation therapy because a loss of organ function may result.

**NEW METHODS OF TREATMENT** Melanoma skin cancer research is ongoing and directed toward more specific methods of diagnosis and treatment. Examples are as follows:

- **Gene therapy:** Clinical trials are in progress to test the effectiveness of adding certain genes to the malignant cells.
- **Melanoma DNA research:** Knowledge of how ultraviolet light harms DNA is increasing, providing support for referral for genetic counseling for people with a strong family history of melanoma.
- **Immune therapy:** Vaccines are being developed to make an individual immune to his or her melanoma cells, or to train the person's immune cells to fight the cancer.
- **Staging:** Very sensitive new tests can better detect the spread of melanoma to lymph nodes and can possibly better identify people who could be helped by a treatment such as immunotherapy after surgery.



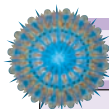
## NURSING CARE

Nurses have the opportunity to assess the skin of clients requiring care for many different health problems and may be the first healthcare provider to identify suspicious lesions. Wide excision and the high risk of metastasis from malignant melanoma usually require inpatient surgical treatment, with the nurse providing care and teaching. See the following page for a nursing care plan for a client with malignant melanoma.

## Health Promotion

The most important aspect of preventing malignant melanoma is a health history and skin assessment. The American Cancer Society recommends that people between the ages of 20 and 40 see a skin specialist every 3 years and those over 40 have annual skin checkups. People with actinic keratoses should also have their skin checked regularly for any signs of change. Clients at risk (those with precancerous lesions and with personal risk factors), as well as those over age 40, should conduct a monthly skin self-examination (described earlier in Box 16–6). When self-assessing for melanoma, the client looks for a change in:

- Color, especially any lesion that becomes darker or variegated in shades of tan, brown, black, red, white, or blue
- Size, especially any lesion that becomes larger or spreads out



## NURSING CARE PLAN A Client with Malignant Melanoma

Geoff Sanders, age 69, is retired from the postal service. He has always been an avid participant in outdoor sports: When he was younger he played baseball and tennis, and for the last 10 years he has played golf at least twice a week. He now lives in Connecticut, but as a younger man he lived in Florida for almost 15 years. Mr. Sanders has a variety of warts and moles and rarely pays attention to them. However, after taking a shower one day he noticed that a mole on his left lower leg looked bigger and darker. Mr. Sanders had just seen a public announcement on television about the dangers of changes in moles, and he immediately called his primary HMO physician for an appointment at the dermatology clinic.

### ASSESSMENT

On arriving at the clinic, Mr. Sanders is interviewed and examined by Tom Hall, a clinical nurse specialist. Following the assessment, Tom documents the following information.

Mr. Sanders has a family history of skin cancer; his father had several squamous cell cancers removed from his face. He has numerous nevi on his body; the one causing concern is located on the medial anterior left leg, 2 inches below the patella. Mr. Sanders states that the mole has been present for years but that he noticed just yesterday that it has become larger and darker. On further questioning, he states that the mole itches sometimes but has never hurt or bled. Mr. Sanders lived in Florida for 15 years and now experiences a sunburn early each summer before he tans. The sunburn involves the lower legs because Mr. Sanders wears shorts during his twice-weekly golf game.

A complete skin assessment reveals various freckles, warts, and nevi. With the exception of the nevus that prompted Mr. Sanders to come to the clinic, all lesions appear normal. The nevus in question is raised, 3 cm in diameter, with irregular borders and a nodular surface. It is variegated in color, with various shades of brown. The skin surrounding the nevus is slightly erythematous. Inguinal lymph nodes are not enlarged or painful. Tom Hall takes a photograph of the lesion with Mr. Sanders's permission.

Following the assessment, Mr. Sanders discusses the lesion with a surgeon, who recommends excision. They discuss the possibility of skin cancer and the importance of early detection and treatment. Mr. Sanders is scheduled for a biopsy of the nevus under a local anesthetic the following morning. Following the biopsy, histologic examination reveals lentigo maligna melanoma. Staging of the tumor reveals that it is a melanoma *in situ*, with no metastasis to regional lymph nodes. Mr. Sanders undergoes a wide excision of the lesion the following afternoon.

### DIAGNOSES

- *Impaired Skin Integrity* related to excision of melanoma from the left lower leg
- *Risk for Infection* related to surgical wound on left lower leg
- *Acute Pain* related to wide excision of melanoma on left lower leg
- *Anxiety* related to diagnosis of skin cancer

### EXPECTED OUTCOMES

- Demonstrate complete healing of the incision without manifestations of infection.
- Verbalize relief of pain by the time the incision is healed.
- Verbalize fears and concerns about his diagnosis.

### PLANNING AND IMPLEMENTATION

- Make the first dressing change, but ensure that Mr. Sanders can safely change the dressing himself prior to discharge the day after surgery.
- On discharge, provide adequate dressings and tape for the first home dressing change; include in discharge instructions necessary information about where to buy supplies and how many dressing supplies will be needed.
- Review and provide written instruction for prescribed systemic antibiotic and pain medication.
- Provide written instructions for dressing change, manifestations of infection, and phone number of clinic; stress importance of calling if any abnormal symptoms occur.
- Teach how to protect the incision from bumps and to protect the site from irritants.
- Discuss diagnosis, positive outlook for treatment of melanoma *in situ*, and the client's concerns.
- Stress importance of lifelong regular healthcare evaluations to identify any recurrence or metastasis.

### EVALUATION

Mr. Sanders returned to the dermatology clinic 1 week after his surgical incision. His incision is well approximated and shows no signs of infection. He is taking his antibiotic 4 times a day as prescribed and reports that his need for pain medications is decreasing. During his clinic visit the following week, Tom Hall removes the sutures and assesses the wound as healed. Mr. Sanders completed his antibiotics and no longer requires pain medications. He says he is still "scared to death" about having cancer, but he has decided to join a local cancer support group. He also says he had gotten a list of skin safety rules from the American Cancer Society and will be sure to cover up and use sunscreens when he plays golf. Mr. Sanders makes an appointment for follow-up care in 3 months.

### CRITICAL THINKING IN THE NURSING PROCESS

1. Consider reasons why people who notice a change in a skin lesion put off seeking health care. What can nurses do to effect change?
2. Design a teaching plan for young adults for preventing skin cancers.
3. What would you say to Mr. Sanders if he called the clinic and said that the antibiotics were making him sick and he didn't think he needed them anyway?
4. Design a nursing care plan for Mr. Sanders for the diagnosis *Powerlessness*.

*See Evaluating Your Response in Appendix C.*

- Shape, especially any lesion that protrudes more from the skin or begins to have an irregular outline
- Appearance of a lesion, especially bleeding, drainage, oozing, ulceration, crusting, scaliness, or development of a mushrooming outward growth

- Consistency, especially any lesion that becomes softer or is more easily irritated
- Skin around a lesion, such as redness, swelling, or leaking of color from a lesion into the surrounding skin
- Sensation, such as itching or pain.

## Assessment

Skin assessment is discussed in Chapter 15 ∞. Specific health history questions and assessments for skin cancer are outlined in Box 16–8.

## Nursing Diagnoses and Interventions

Although many different nursing diagnoses may be appropriate for the client with a malignant melanoma, common responses are *Impaired Skin Integrity*, *Hopelessness*, and *Anxiety*.

### Impaired Skin Integrity

Malignant melanomas not only destroy skin layers but also invade body structures. Certain types of melanomas may ulcerate prior to diagnosis, and treatment typically involves some type of surgical biopsy and excision. Any open lesion or incision increases the risk for secondary infection.

- Monitor for manifestations of infection: fever, tachycardia, malaise, incisional erythema, swelling, pain, or drainage that increases or becomes purulent. *Intact skin is the first line of defense against infection; impaired skin integrity increases the risk for infection. If infection is present, the client may have both systemic and local manifestations.*
- Keep the incision line clean and dry by changing dressings as necessary. *Moisture increases the risk of infection.*
- Follow principles of medical and surgical asepsis when caring for client's incision. Teach family members and visitors the importance of careful hand washing. Maintain standard precautions if drainage is present. Careful hand washing is essential in preventing the spread of infection. *Aseptic techniques are necessary when caring for any surgical incision to prevent infection.*

### PRACTICE ALERT

Nurses must use standard precautions with blood and body fluids to protect themselves from exposure to HIV.

- Encourage and maintain adequate caloric and protein intake in the diet. Suggest a consultation with the dietitian if client does not want to eat. *Adequate kilocalories and protein are necessary for proper healing. The client with cancer has increased metabolic needs; if these needs are not met, nutritional problems that impair healing may result.*

### Hopelessness

Hopelessness is an emotional state in which a person feels that there is no possibility that life will improve. Clients who experience hopelessness are often withdrawn, passive, and apathetic.

The diagnosis of malignant melanoma threatens the quality and quantity of life as the client faces the possibility or reality of metastasis; the possibility that the cancer may recur and cause death; and alterations in self-concept, roles, and relationships. Inspiring hope in clients during this health crisis is a legitimate nursing action.

- Provide an environment that encourages the client to identify and express feelings, concerns, and goals:
  - Use active listening, ask open-ended questions, and reflect on the client's statements.
  - Acknowledge and respect feelings of apathy and/or anger as expressions of distress.
  - Convey an empathetic understanding of the fears and concerns.
  - Provide opportunities to express positive emotions: hope, faith, a sense of purpose, and the will to live.

## BOX 16–8 Nursing Assessment for Skin Cancer

### Interview Questions

- Have any members of your family ever been treated for skin cancer?
- Have you had a skin cancer removed from any part of your body?
- Have you noticed any change in the size, shape, or color of a mole, wart, birthmark, or scar?
- Do you have any moles, warts, birthmarks, or scars that itch, are painful, have crusting, or bleed?
- In what parts of the country or world have you lived?
- Have you ever been badly sunburned?
- Do you visit tanning salons?
- Are you exposed to any hazardous chemicals in your job?
- Have you been taught how to examine your skin? If so, how do you do this examination? How often?

### Physical Assessment

1. Ask the client to remove all clothing and put on an examination gown. Ensure good light; natural, bright light is best for inspection of lesions. The client may sit, stand, or lie down.
2. Inspect and palpate the skin. Stretching the skin tightly during assessment facilitates assessment of nodular and scaly lesions and lesions in the dermis. Assess for:
  - a. Obvious lesions
  - b. Visible swellings
  - c. Alterations in normal contour and borders of nevi
  - d. Enlarged lymph glands
  - e. Skin or mucosal discolorations
  - f. Areas of ulceration, scaling, crusting, or erosion.
3. The order of assessment follows:
  - a. Head and neck: entire scalp, eyelids, external ear, auditory canals, external surface of the nose, internal surface of the nose, the oral cavity, facial skin, the facial glands (parotid, submaxillary, sublingual)
  - b. Thyroid and neck, including lymph glands
  - c. Chest and abdomen, with special attention under pendulous breasts, in skin folds, and in areas covered with hair
  - d. Back and buttocks, with special attention to the area between the buttocks
  - e. Extremities, with special attention to the axillae, nail beds, webs between the fingers and toes, and soles of the feet
  - f. External genitals, with special attention to skin folds, mucous membranes, and areas covered with hair.
4. Measure and record a description of all skin lesions on an anatomic chart. Take photographs (if possible) of any suspicious lesion, and include them in the client's record for future reference.



- Explore the client's perceptions, and modify or clarify them if necessary by providing information and correcting misconceptions.
- Encourage the client to identify support systems and sources of strength and coping in the past.

*Verbalizing feelings, concerns, and goals allows others to validate or correct them, promotes a therapeutic nurse–client relationship, and fosters feelings of self-worth. Expressing positive emotions and calling on support systems and sources of strength that were effective in coping with past crises help the person resolve the crisis and develop hope.*

- Encourage active participation in self-care as well as in mutual decision making and goal setting. *Meeting self-care needs and making decisions about care increase personal confidence in one's capacity for coping.*
- Encourage a focus not only on the present but also on the future: Review past occasions for hope, discuss the client's personal meaning of hope, establish and evaluate short-term goals with the client and family, and encourage them to express hope for the future. *The nurse mobilizes the client's resources to strengthen motivation, hope, and the will to live.*

## Anxiety

The intensity of anxiety, aroused by a perceived threat, depends on the severity of the present situation and the client's ability to handle the threat. Anxiety is one of the most common psychosocial responses in clients with cancer. Anxiety increases at the time of diagnosis and remains a constant emotion throughout the course of treatment, regardless of treatment type or setting. Interventions center on helping the client recognize the manifestations of anxiety, determining whether the client wishes to do anything about the anxiety, and facilitating coping strategies.

- Provide reassurance and comfort:
  - Set aside time to sit quietly with the client.
  - Speak slowly and calmly.
  - Convey empathetic understanding by touch and supporting present coping mechanisms, such as crying and talking.
  - Do not make demands or expect the client to make decisions. *Coping behaviors differ from situation to situation and from person to person. Anxiety at moderate to severe levels narrows perceptions and the ability to function.*
- Decrease sensory stimuli by using short, simple sentences; focusing on the here and now; and providing concise information. *Higher levels of anxiety result in a focus on the present, inability to concentrate, and difficulty in understanding verbal communications.*
- Provide interventions that decrease anxiety levels and increase coping:
  - Provide accurate information about the illness, treatment, and expected length of recovery.
  - Encourage discussion of expected physical changes and ways to minimize disfigurement through cosmetics and clothing.
  - Include family members in teaching sessions.
  - Encourage participation in care. *Although the prognosis and treatment of melanoma depend on various factors, the*

*prognosis of complete cure is decreased with metastasis. Surgical incisions include excision with wide margins, which may cause disfigurement. Active participation in care gives the client some control over the future and is often an effective means of coping with anxiety.*

## Using NANDA, NIC, and NOC

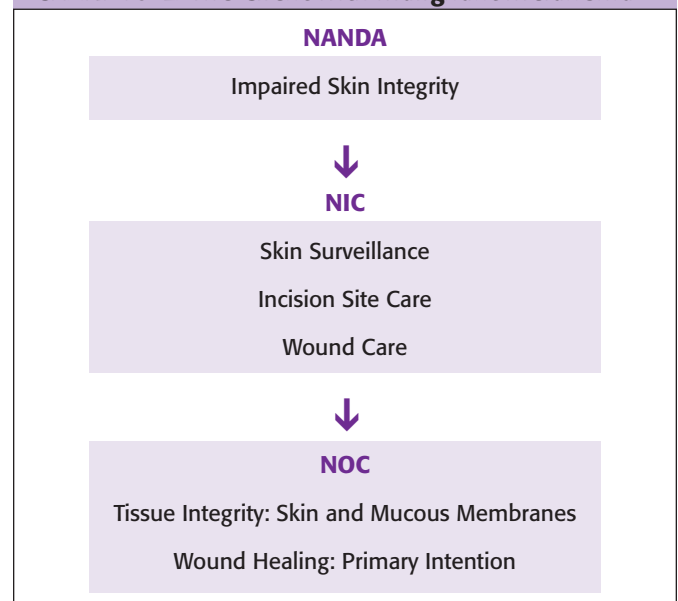
Chart 16–2 shows links between NANDA, NIC, and NOC when caring for the client with malignant melanoma.

## Community-Based Care

Health education for the client and family experiencing the diagnosis and treatment of malignant melanoma involves self-care and ongoing self-monitoring. Education for the client and family is specific to the type of treatment. In addition to wound care, clients who have had a lymph node dissection need instructions on how to protect the extremity from bleeding, trauma, and infection. Address the following topics:

- Schedule regular medical checkups every 3 months for the first 2 years, every 6 months for the next 5 years, and yearly thereafter.
- Proper self-care combined with regular medical care can help the client lead a fairly normal life.
- If assistance for home care is necessary, provide referrals to a community health agency or a home care agency. In addition, refer the client to a local cancer support group if desired. Other resources are:
  - The American Cancer Society
  - The Skin Cancer Foundation.


### NANDA, NIC, AND NOC LINKAGES CHART 16–2 The Client with Malignant Melanoma



Data from *NANDA's Nursing Diagnoses: Definitions & Classification 2005–2006* by NANDA International (2005), Philadelphia; *Nursing Interventions Classification (NIC)* (4th ed.) by J. M. Dochterman & G. M. Bulechek (2004), St. Louis, MO: Mosby; and *Nursing Outcomes Classification (NOC)* (3rd ed.) by S. Moorhead, M. Johnson, and M. Maas (2004), St. Louis, MO: Mosby.



## SKIN TRAUMA

Trauma to the skin can be unintentional or intentional (as in the case of surgery). Chemicals, radiation, pressure, or thermal changes cause skin trauma. This section discusses pressure ulcers and frostbite, as well as intentional trauma from cutaneous and plastic surgery or treatment. Thermal injury (burns) is discussed in Chapter 17 .

### THE CLIENT WITH A PRESSURE ULCER

**Pressure ulcers** are ischemic lesions of the skin and underlying tissue caused by external pressure that impairs the flow of blood and lymph (Porth, 2005). The ischemia causes tissue necrosis and eventual ulceration. These ulcers, also called bed sores or decubitus ulcers, tend to develop over a bony prominence (such as the heels, greater trochanter, sacrum, and ischia), but they may appear on the skin of any part of the body subjected to external pressure, friction, or shearing forces.

#### Incidence

The incidence of pressure ulcers in hospitals, long-term care facilities, and home settings is high enough to warrant concern for healthcare providers. The incidence in hospitals has been reported as 8%, whereas the incidence in long-term care facilities is reported to range from 2.4% to 23% (Porth, 2005). Little research has been done to determine the extent of the problem in the home setting. However, with increasing numbers of clients (and especially older adult clients) being cared for in the home, it is probable that the incidence is great enough to warrant plans of care to prevent their occurrence.

#### Pathophysiology

Pressure ulcers develop from external pressure that compresses blood vessels or from friction and shearing forces that tear and injure vessels. Both types of pressure cause traumatic injury and initiate the process of pressure ulcer development.

External pressure that is greater than capillary pressure and arteriolar pressure interrupts blood flow in capillary beds. When pressure is applied to skin over a bony prominence for 2 hours, tissue ischemia and hypoxia from external pressure cause irreversible tissue damage. For example, when the body is in the supine position, the body's weight applies pressure to the sacrum. The same amount of pressure causes more damage when it is applied to a small area than when it is distributed over a large surface.

Shearing forces result when one tissue layer slides over another. The stretching and bending of blood vessels cause injury and thrombosis. Clients in hospital beds are subject to shearing forces when the head of the bed is elevated and the torso slides down toward the foot of the bed. Pulling the client up in bed also subjects the client to shearing forces. (For this reason, always lift clients up in bed.) In both cases, friction and moisture cause the skin and superficial fascia to remain fixed to the bed sheet, while the deep fascia and bony skeleton slides in the direction of body movement.

When a person lies or sits in one position for an extended length of time without moving, pressure on the tissue between a bony prominence and the external surface of the body distorts

capillaries and interferes with normal blood flow. If the pressure is relieved, blood flow to the area increases, and a brief period of reactive hyperemia occurs without permanent damage. However, if the pressure continues, platelets aggregate in the endothelial cells surrounding the capillaries and form microthrombi. These microthrombi impede blood flow, resulting in ischemia and hypoxia of tissues. Eventually, the cells and tissues of the immediate area of pressure and of the surrounding area die and become necrotic.

Alterations in the involved tissue depend on the depth of the injury. Injury to superficial layers of skin results in blister formation, whereas injury to deeper structures causes the pressure ulcer area to appear dark reddish-blue. As the tissues die, the ulcer becomes an open wound that may be deep enough to expose the bone. The necrotic tissue elicits an inflammatory response, and the client experiences increases in temperature, pain, and white blood cell count. Secondary bacterial invasion is common. Enzymes from bacteria and macrophages dissolve necrotic tissue, resulting in a foul-smelling drainage.

Pressure ulcers are graded or staged to classify the degree of damage. The stages are listed in Box 16–9.

**RISK FACTORS** Although a pressure ulcer may develop in an adult of any age who has an impairment in mobility, those most at risk are older adults with limited mobility, people with quadriplegia, and clients in the critical care setting (Porth, 2005). Other clients prone to develop pressure ulcers are those with fractures of large bones (e.g., hip or femur) or who have undergone orthopedic surgery or sustained spinal cord injury. In addition to deficits in mobility and activity, incontinence and nutritional deficit also increase the risk of pressure ulcer development. Clients with chronic illnesses, such as renal failure and anemia, and those with edema or infection are also at increased risk.

The older adult is at increased risk for the development of pressure ulcers because of age-related skin changes. The skin of the older adult has a thicker epidermis, a thinner dermis with decreased vascularity, decreased sebaceous gland activity, and decreased strength and elasticity. As a result, the more fragile and less nourished dermal layer is more prone to shear and friction problems. In addition, the skin of the older adult responds more slowly to inflammation, and wounds heal more slowly; when pressure ulcers occur, they are more difficult to reverse. See Nursing Care of the Older Adult on page 474 for information about preventing pressure ulcer development in older adults.

### INTERDISCIPLINARY CARE

For the client at risk for pressure ulcers, the goal is prevention. Existing ulcers require interdisciplinary treatment to promote healing and restore skin integrity.

#### Diagnosis

Diagnostic tests are conducted to determine the presence of a secondary infection and to differentiate the cause of the ulcer. If the ulcer is deep or appears infected, drainage or biopsied tissue is cultured to determine the causative organism.

**BOX 16–9 Pressure Ulcer Staging****STAGE I**

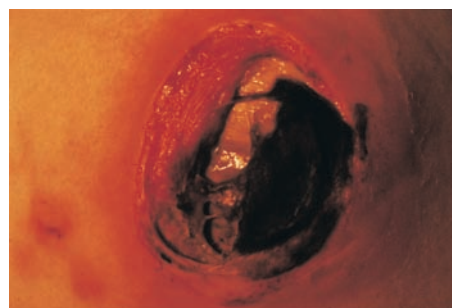
Nonblanchable erythema of intact skin; the heralding lesion of skin ulceration. Identification of stage I pressure ulcers may be difficult in clients with darkly pigmented skin. *Note:* Reactive hyperemia can normally be expected to be present for one-half to three-fourths as long as the pressure occluded blood flow to the area. This should not be confused with stage I pressure ulcer.

**STAGE II**

Partial-thickness skin loss involving epidermis and/or dermis. The ulcer is superficial and presents clinically as an abrasion, blister, or shallow crater.

**STAGE III**

Full-thickness skin loss involving damage or necrosis of subcutaneous tissue that may extend down to, but not through, underlying fascia. The ulcer presents clinically as a deep crater with or without undermining of adjacent tissue.

**STAGE IV**

Full-thickness skin loss with extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures (for example, tendon or joint capsule). Sinus tracts may also be associated with stage IV ulcers.

*Note:* When eschar is present, accurate staging of the pressure ulcer is not possible until the eschar has sloughed or the wound has been debrided.

*Source:* Text is from *Pressure Ulcers in Adults: Prediction and Prevention* by the Agency for Health Care Policy and Research, 1992 Rockville, MD: U.S. Department of Health and Human Services. Photos courtesy of Karen Lou Kennedy, RN, FPN, [www.kennedyterminalulcer.com](http://www.kennedyterminalulcer.com).

**Medications**

Topical and systemic antibiotics specific to the infectious organism eradicate any infection present. Additionally, a variety of topical products promote healing. Examples are listed in Table 16–4.

**Surgical Treatment**

Surgical debridement may be necessary if the pressure ulcer is deep; if subcutaneous tissues are involved; or if an eschar (a

scab or dry crust that forms over skin damaged by burns, infections, or excoriations) has formed over the ulcer, preventing healing by granulation. Large wounds may require skin grafting for complete closure.

**NURSING CARE**

The client with one or more pressure ulcers not only has impaired skin integrity but also is at increased risk for



## NURSING CARE OF THE OLDER ADULT

## Pressure Ulcer Prevention

Older adults are at a greater risk for developing pressure ulcers because of age related changes in the integumentary system. Cell renewal slows, resulting in skin that has decreased elasticity. The margin between the epidermis and the dermis separates more easily making the skin more prone to tearing. In addition, thinning subcutaneous tissue provides less cushioning over bony prominences. Water content decreases, and the skin becomes drier. These changes increase the older adult's susceptibility to skin trauma and prolong wound healing.

Chronic conditions associated with immobility and self-care deficit place older adults at risk of developing pressure ulcers. For example, bowel or bladder incontinence can produce regions of wet skin that are prone to infections and breakdown. Furthermore, sensory-perceptual alterations and impaired cognitive functioning may reduce the frequency with which the older adult shifts position when sitting or lying in bed. Finally, undernutrition, which is often seen in older adults, heightens the risk for developing pressure ulcers.

To prevent pressure ulcers, the skin of older adults should be kept clean, dry, and well hydrated. Moisturizers are recommended to keep the skin free of excessive dryness. Older adults should be taught to avoid bumping into furniture and to wear long skirts or pants to help protect the lower extremities from trauma.

When hospitalized, older adults should have a validated risk assessment for pressure ulcers completed on admission and as often as the tool suggests. A daily systematic skin inspection with particular attention to bony prominences should be completed.

Once pressure ulcers develop in older adults, the treatment is the same as for younger clients. However, additional steps may need to be taken. Because local perfusion to tissues is compromised, steps should be taken to prevent under- or overhydration. It is essential that optimal nutritional status be maintained. Also, keep in mind that it may take a longer time for the pressure ulcer to heal.

infection, pain, and decreased mobility. Pressure ulcers prolong treatment for other health problems, increase healthcare costs, and diminish the client's quality of life. See the Nursing Research box on the following page for information on evidence-based interventions.

## Nursing Diagnoses and Interventions

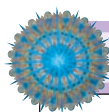
The following interventions and rationales are adapted from the clinical guidelines developed by the Agency for Health Care Policy and Research (1992, 1994) in identifying adults at risk and treating those with stage I pressure ulcers.

### Risk for Impaired Skin Integrity

- Identify at-risk individuals needing prevention and the specific factors placing them at risk.
- Assess bed- and chair-bound clients, as well as those who are unable to reposition themselves, for additional risk factors: immobility, incontinence, nutritional factors (such as inadequate dietary intake and impaired nutritional status), and altered level of consciousness.
- Assess clients on admission to acute care and rehabilitation hospitals, nursing homes, home care programs, and other healthcare facilities.

TABLE 16–4 Products Used to Treat Pressure Ulcers

STAGE	PRODUCT	PURPOSE
I	Skin Prep Granulex	Toughens intact skin and preserves skin integrity. Prevents skin breakdown, increases blood supply, adds moisture, contains trypsin to aid in removal of necrotic tissue.
	Hydrocolloid dressing (e.g., DuoDerm)	Prevents skin breakdown and promotes healing without the formation of a crust over the ulcer. Is permeable to air and water vapor; prevents the growth of anaerobic organisms.
	Transparent dressing (e.g., Tegaderm)	Prevents skin breakdown; prevents entrance of moisture and bacteria but allows oxygen and moisture vapor permeability.
II	Transparent dressing	Enhances healing (see above).
	Hydrocolloid dressing	Enhances healing (see above). <i>Note:</i> If infection is present, these types of dressings are contraindicated. A sterile dressing should be applied instead.
III	Wet-to-dry gauze dressing with sterile normal saline	Allows necrotic material to soften and adhere to the gauze, so that the wound is debrided.
	Hydrocolloid dressing	Enhances healing (see above).
	Proteolytic enzymes (such as Elase)	Proteolytic enzymes serve as a debriding agent in inflamed and infected lesions.
IV	Wet-to-dry gauze dressing with sterile normal saline	Enhances healing (see above). <i>Note:</i> Transparent or hydrocolloid dressings or skin barriers are contraindicated.
	Vacuum-assisted closure (V.A.C.)	Creates a negative pressure to help reduce edema, increase blood supply and oxygenation, and decrease bacterial colonization. Also helps promote moist wound healing and the formation of granulation tissue.



## NURSING RESEARCH Evidence-Based Practice for Treating Pressure Ulcers

Despite advances in health care to extend life and improve functional status, older adults with chronic illnesses are at increased risk of developing pressure ulcers. The older adult, with age-related compromised cellular activity, is especially vulnerable to impaired healing of injured tissue such as pressure ulcers. This article (Frantz, 2004) describes an evidence-based protocol designed to enhance the healing of pressure ulcers in older clients by using evidence-based interventions. The following interventions are recommended:

- Assess all individuals admitted to a healthcare facility with a pressure ulcer for the risk of developing additional pressure ulcers by using a standardized risk assessment scale.
- Perform a complete history and physical examination, combined with a detailed assessment of the ulcer characteristics (location, stage, type of tissue, presence of tunneling or tracts, exudate, odor, and condition of skin around the ulcer).
- Remove necrotic tissue and debris from the ulcer to decrease the growth of bacteria and remove foreign materials, such as exudates and metabolic wastes.
- Provide a moist wound environment to promote reepithelialization and healing.
- Control bacterial levels in the wound by using cleansing and debridement, as well as systemic and topical antibiotics.
- Supply essential substrates for tissue repair, including protein, calories, vitamins, and minerals. Maintain a positive nitrogen balance.

- Manage tissue loads by positioning to avoid external force on the ulcer.

### IMPLICATIONS FOR NURSING

The design and implementation of a pressure ulcer prevention and treatment plan is essential for any person at risk, including older adults, those with debilitating or multiple illnesses, and those with health problems limiting mobility. To effectively implement a plan, it is important to prepare providers to use a standard protocol through educational programs, and to monitor indicators of improvement or deterioration in the ulcer and presence or absence of new ulcers. These outcomes should be assessed and recorded on a weekly basis.

### CRITICAL THINKING IN CLIENT CARE

1. Describe the differences and similarities in a pressure ulcer prevention plan of care you would develop for two clients: a 76-year-old man in a nursing home who has had a stroke that paralyzed his left side, and a 36-year-old man with a spinal cord injury from a motorcycle crash who cannot walk and lives at home.
2. Consider the activities to treat pressure ulcers. What would you do about the following:
  - a. What level of healthcare provider would you delegate to care for the client?
  - b. How much time in an 8-hour period would be needed for nursing care?
  - c. What would you teach family caregivers about providing care at home?

Source: Franz, R. (2004). Treatment of pressure ulcers. *Journal of Gerontological Nursing*, 30(5), 4–10.

- Conduct a systematic risk assessment by using a validated risk assessment tool (such as the Braden scale).
- Document all assessments of risk. *Individuals at risk for pressure ulcers must be identified so that risk factors can be reduced through intervention. The primary risk factors for pressure ulcers are immobility and limited activity; therefore, assess clients who cannot reposition themselves or whose activity is limited to bed or chair. Validated tools ensure systematic evaluation of individual risk factors. The client requires periodic reassessment for pressure ulcers. Accurate and complete documentation of all risk assessments ensures continuity of care and may be used as a foundation for the skin care plan.*
- Conduct a systematic skin inspection at least once a day, paying particular attention to the bony prominences. Systematic, comprehensive, and routine skin care may decrease pressure ulcer incidence (although the exact role is unknown). Inspect the following to assess a pressure ulcer:
  - Location of any lesion or ulcer
  - Estimation of the stage
  - Dimensions of the ulcer: length, width, depth
  - Presence of any abnormal pathways in the wound:
    - Sinus tract: a cavity or channel underneath the wound
    - Tunneling: a passageway or opening that may be visible at skin level, but with most of the tunnel under the surface of the skin

- Undermining: areas of tissue destruction underneath intact skin along wound margins
- Visible necrotic tissue (Slough is necrotic tissue that is in the process of separating from viable tissue.)
- Presence of an exudate
- Presence or absence of granulation tissue

*Skin inspection provides data the nurse uses in designing interventions to reduce risk and in evaluating outcomes of those interventions.*

- Clean the skin at the time of soiling and at routine intervals, as frequently as the client's need or preference dictates. Avoid hot water, use a mild cleansing agent, and clean the skin gently, applying as little force and friction as possible. *Metabolic wastes and environmental contaminants accumulate on the skin; these potentially irritating substances should be removed frequently. Feces and urine cause chemical irritation and should be removed as soon as possible. Hot water may cause skin injury. Mild cleansing agents are less likely to remove the skin's natural barrier.*
- Minimize environmental factors leading to skin drying, such as low humidity and exposure to cold. Treat dry skin with moisturizers. *Well-hydrated skin resists mechanical trauma. Hydration decreases as the ambient air temperature decreases, especially when the air humidity is low. Poorly hydrated skin is less pliable, and severe dryness is associated with fissuring and cracking of the stratum corneum. Moisturizers reduce dry skin.*

- Avoid massage over bony prominences. *Although massage has been practiced for years, evidence now suggests that massage over bony prominences may lead to deep tissue trauma in clients at risk for, or with beginning, skin manifestations of a pressure ulcer.*
- Minimize skin exposure to moisture due to incontinence, perspiration, or wound drainage. When these sources of moisture cannot be controlled, use underpads or briefs made of materials that absorb moisture and present a quick-drying surface to the skin. Change underpads and briefs frequently. Do not place plastic directly against the skin. *Moisture from incontinence, perspiration, or wound drainage may contain factors that irritate the skin; moisture alone can increase the susceptibility of the skin to injury.*
- To minimize skin injury due to friction and shearing forces, use proper positioning, transferring, and turning techniques. Lubricants (such as cornstarch or creams), protective films (such as transparent dressings and skin sealants), protective dressings (such as hydrocolloids), and protective padding may also reduce friction injuries. *Shear injury occurs when skin remains stationary and the underlying tissue shifts. This shift diminishes the blood supply to the skin and results in ischemia and tissue damage. Proper positioning, however, can eliminate most shear injuries. Friction injuries to the skin occur when it moves across a coarse surface, such as bed linens. Most friction injuries can be avoided by using appropriate techniques to move clients so that their skin is never dragged across the linens. Any agent that eliminates contact or decreases the friction between the skin and the linens reduces the potential for injury.*
- Assess factors involved in inadequate dietary intake of protein or kilocalories. Offer nutritional supplements, and support the client during mealtimes. If dietary intake remains inadequate, consult with a dietitian about other dietary interventions. *The role nutrition plays in the development of (and to a lesser degree, the healing of) pressure ulcers is not understood, but poor dietary intake of kilocalories, protein, and iron has been associated with the development of pressure ulcers.*
- Maintain the client's current level of activity, mobility, and range of motion. *Frequent turning, repositioning, and movement are essential in reducing the risk of pressure ulcers.*
- For the client on bed rest or who is immobile, provide interventions against the adverse effects of external mechanical forces of pressure, friction, and shear:
  - Reposition all at-risk clients at least every 2 hours, using a written schedule for systematic turning and repositioning.
  - For clients on bed rest, use positioning devices, such as pillows or foam wedges, to protect bony prominences.
- For completely immobile clients, use devices to totally relieve pressure on the heels (the most common method is to raise the heels off the bed). Do not use donut-type devices.
- Avoid placing clients in the side-lying position directly on the trochanter.
- Maintain the head of the bed at the lowest degree of elevation consistent with the client's medical condition and other restrictions. Limit the amount of time the head of the bed is elevated.
- Use assistive devices, such as a trapeze or bed linen, to move clients in bed who cannot assist during transfers and position changes.
- Place any at-risk client on a pressure-reducing device, such as foam, static air, alternating air, gel, or water mattress. *Data indicate that the more spontaneous movements that bedridden, older adult clients make, the lower the incidence of pressure ulcers. Studies reveal that fewer pressure ulcers develop in at-risk clients who are turned every 2 to 3 hours. Proper positioning can reduce pressure on bony prominences. It is difficult to redistribute pressure under heels; suspending the heels is the best method. Do not use donut cushions, which are more likely to cause than to prevent pressure ulcers. Shearing forces are exerted on the body when the head of the bed is elevated. Lifting (rather than dragging) is less likely to cause injury from friction. Pressure-reducing devices and beds can decrease the incidence of pressure ulcers.*
- For chair-bound clients, use pressure-reducing devices. Consider postural alignment, distribution of weight, balance and stability, and pressure relief when positioning these clients. Avoid uninterrupted sitting in a chair or wheelchair. Reposition the client every hour. Teach clients who can do so to shift their weight every 15 minutes. Use a written plan for positioning, movement, and the use of positioning devices. Do not use donut devices. *Prolonged, uninterrupted mechanical pressure results in tissue breakdown. The client's weight should be shifted at least every hour.*

## Community-Based Care

Client and family teaching for care of a pressure ulcer also focuses on prevention and includes much of the same information presented in the preceding section. Because many clients with pressure ulcers are older or have other serious illnesses, a caregiver may require teaching on such topics as the following:

- Definition and description of pressure ulcers
- Common locations of pressure ulcers
- Risk factors for the development of pressure ulcers
- Skin care
- Ways to avoid injury
- Diet.

Depending on the stage of the pressure ulcer, the nurse teaches the client or caregiver how to care for ulcers that are already present: how to change dressings, apply skin barriers, and avoid injury and infection. Referrals to a home health agency or community health department can help the family through the lengthy healing process.

## THE CLIENT WITH FROSTBITE

**Frostbite** is an injury of the skin from freezing. If the exposure to freezing temperatures is limited, only the skin and subcutaneous tissues become involved. However, as exposure increases, deeper structures freeze. The skin freezes when the temperature drops to 14° to 24.8°F (210° to 24°C). Frostbite is most common on exposed or peripheral areas of the body, such as the nose, ears, feet, and hands.



As human tissues freeze, ice crystals form and increase intracellular sodium content. Small blood vessels initially vasoconstrict but then vasodilate and become more permeable, causing cellular and tissue swelling. With continued exposure, vasoconstriction and increased viscosity of the blood cause infarction and necrosis of the affected tissue.

Superficial frostbite causes numbness, itching, and prickling. The skin appears cyanotic, reddened, or white. Deeper frostbite causes stiffness and paresthesias. As the skin and tissues thaw, the skin becomes white or yellow and loses its elasticity. The client experiences burning pain. Edema, blisters, necrosis, and gangrene may appear.

Rapid thawing may significantly decrease tissue necrosis. General guidelines for rewarming areas of frostbite follow:

- If you are outdoors, treat superficial frostbite by applying firm pressure with a warm hand or by placing frostbitten hands in the axillae. If the feet are frostbitten, remove wet footwear, dry the feet, and put on dry footwear. Do not rub the areas with snow.
- In the hospital, rapidly rewarm affected areas in circulating warm water, 104° to 105°F (40° to 40.5°C) for 20 to 30 minutes. Do not rub or massage the areas.

Following rewarming, the client is kept on bed rest with the affected parts elevated. Pain medications and anti-inflammatory agents are administered. Blisters are debrided. Whirlpool therapy may be used to clean the skin and debride necrotic tissue. Recovery from frostbite is usually complete if the involved area has not become necrotic. Necrotic tissue may require amputation.

## THE CLIENT UNDERGOING CUTANEOUS AND PLASTIC SURGERY

Although many skin disorders are so small and benign that no treatment is necessary, others require some type of surgery of the skin to remove the lesion. Other surgeries and treatments for skin lesions and deformities are used to restore function and change appearance. This section discusses both cutaneous and plastic surgery, as well as other types of treatment modalities used in the care of the client with a skin disorder.

### Cutaneous Surgery and Procedures

The basic types of cutaneous surgery described here are excision, electro-surgery, cryosurgery, curettage, and laser surgery. Two nonsurgical procedures, chemical destruction and sclerotherapy, are also discussed. Most of these procedures are performed in the caregiver's office or outpatient clinic.

#### Fusiform Excision

Fusiform excision is the removal of a full thickness of the epidermis and dermis, usually with a thin layer of subcutaneous tissue. It is used to remove tissue for biopsies and for complete removal of benign and malignant lesions of the skin. Most fusiform excisions have a length-to-width ratio of 3 to 1.

Excision of small, superficial lesions is performed under a local anesthetic, and care is taken to place the incision in a way that will provide good cosmetic results. The incision line is usually closed with sutures, and the wound is covered with a dry dressing, an occlusive dressing, or a hydrocolloid dressing.

### Electrosurgery

Electrosurgery involves the destruction or removal of tissue with high-frequency alternating current. A variety of surgical procedures may be performed, including *electrodesiccation* (which produces superficial skin destruction), *electrocoagulation* (which produces deeper tissue destruction), and *electrosection* (which can cut through skin and tissue). Electrodesiccation is used to remove benign surface lesions, such as skin tags, keratoses, warts, and angiomas. It is also used to produce hemostasis for capillary bleeding. Electrocoagulation is used to remove telangiectases, warts, and superficial nonmelanoma skin cancers. Electrosection is used to make incisions, excise tissue, and perform biopsies.

### Cryosurgery

Cryosurgery is the destruction of tissue by cold or freezing with agents such as fluorocarbon sprays, carbon dioxide snow, nitrous oxide, and liquid nitrogen. Cryosurgery is used to treat many skin lesions (e.g., keratoses, lentigo maligna, venous lakes, nevi, keloids, and Kaposi's sarcoma). The freezing agents are applied topically to the lesion.

The effects of freezing depend on the degree of freeze. Light freezing causes damage to the epidermis with blistering or crusting that heals without scarring. Deeper freezes, used to treat malignant cells, cause edema, necrosis, and tissue slough. The effects of cryosurgery may not be obvious until 24 hours following treatment. Postoperatively, infection is prevented by applying a topical antibiotic and keeping the treated areas clean. Healing occurs in 2 to 3 weeks.

### Curettage

Curettage is the removal of lesions with a curette (a semisharp cutting instrument). The design of the curette allows it to cut through soft or weak tissue, but not through normal tissue. It is used primarily to remove benign and malignant superficial epidermal lesions. Benign lesions removed by curettage include keratoses, nevi, and angiomas. Nonmelanoma skin lesions are removed by curettage if they are small, well-defined, primary tumors. Curettage is also used to remove specimens of tissue for biopsy.

Following curettage, the wound may be treated with electrodesiccation to destroy any remaining malignant cells and to provide hemostasis. These wounds are not closed; rather, they are left open to heal by second intention. Topical antibiotic ointments and dressings may be used in the postoperative period.

### Laser Surgery

Laser surgery is used to treat clients with a wide variety of skin disorders, including port-wine stains, telangiectases, and venous lakes. A laser is an intense light that produces a thermal injury on contact with tissue. The injury causes coagulation, vaporization, excision, and ablation (removal of a growth). Argon, pulsed dye, carbon dioxide, and Nd:YAG lasers are used in cutaneous and plastic surgery. A local anesthetic may be used, although the pulsed dye laser causes minimal pain and rarely requires anesthesia.

The response differs by type of laser. Following treatment with the argon laser, the lesion appears from white to black in color, a blister forms, and the skin may peel. The area weeps, and an eschar forms; in 10 to 14 days, the eschar separates, revealing an

underlying red area. The redness fades over a period of up to 1 year. However, pulsed dye laser treatment does not result in blistering or weeping; only rarely does it result in eschar.

### Chemical Destruction

Chemical destruction is the application of a specific chemical to produce destruction of skin lesions. Chemical destruction is used to treat both benign and premalignant lesions. The chemical is applied to the lesion or is used to cause peeling. After application, the treated area forms a thin crust that sloughs off in about a week.

### Sclerotherapy

Sclerotherapy is the removal of benign skin lesions with a sclerosing agent that causes inflammation with fibrosis of tissue. Agents that cause therapeutic sclerosis include aethoxysclerol (Sclerodex) and hypertonic sodium chloride. This type of treatment is used for telangiectases and superficial spider veins of the lower extremities. The solution is injected into the affected veins, causing a reaction that closes the lumen of the vein.

### Plastic Surgery

Plastic surgery is the alteration, replacement, or restoration of visible portions of the body, performed to correct a structural or cosmetic defect. The word *plastic* comes from the Greek word *plastikos*, which means “able to be molded.”

Many skin disorders discussed in this chapter cause changes in appearance. For example, acne may leave deep pitting scars, nevi and keloids are often disfiguring, and skin cancers may require wide excision and skin grafting. These scars, lesions, and wounds often cause embarrassment and alterations in body image. In addition, the removal of lesions may leave unsightly scars or areas of obviously missing tissue.

Cosmetic surgery, also called aesthetic surgery, is one of two fields within plastic surgery. Cosmetic surgery enhances the attractiveness of normal features. Almost 11.5 million surgical and nonsurgical cosmetic procedures were performed in 2005 (American Society for Aesthetic Plastic Surgery, 2005). The top five procedures are liposuction, breast augmentation, eyelid surgery, rhinoplasty, and “tummy tuck.” The other field, reconstructive surgery, uses similar techniques; however, its purpose is to improve the function or appearance of parts of the body damaged by trauma, disease, or birth defects.

Many of the plastic surgeries permanently alter body image. To provide the client with a preview of what surgery will accomplish, some surgeons integrate computer imaging into preoperative teaching. The computer projects a photograph of the targeted area onto a monitor and uses graphics to demonstrate how the size and/or shape of the body part or area will change as a result of the surgery.

### Skin Grafts and Flaps

Skin grafts and flaps are used to restore function while also maintaining an acceptable appearance. Both of these procedures involve the movement of skin from one part of the body to another part.

A **skin graft** is a surgical method of detaching skin from a donor site and placing it in a recipient site, where it develops a new blood supply from the base of the wound. Skin grafting is an effective way to cover wounds that have a good blood supply, are not infected, and in which bleeding can be controlled.

Skin grafts may be either split thickness or full thickness (Figure 16–20 ■). A *split-thickness graft* contains epidermis and only a portion of dermis of the donor site. Split-thickness grafts range in thickness from 0.010 inch to greater than 0.015 inch. A common donor site for a skin graft is the anterior thigh. Skin is removed in sheets from the donor site with a dermatome. Donor sites of split-thickness grafts heal by reepithelialization. A meshed graft is a type of split-thickness graft that is rolled under a special cutting machine to form a mesh pattern with perforations. The perforations allow drainage of serum and blood from under the graft. After healing, however, the skin has a rough appearance. A *full-thickness graft* contains both epidermis and dermis. These layers contain the greatest number of skin elements (sweat glands, sebaceous glands, or hair follicles) and are best able to withstand trauma. Areas of thin skin are the best donor sites for full-thickness skin grafts. The donor site must be surgically closed and will scar.

Other types of grafts are composite grafts and cultured epithelial grafts. Composite grafts are usually used on the face. They contain skin, subcutaneous tissue, cartilage, or other tissue. Cultured epithelial grafts are made from epithelial cells cultured *in vivo*, coalesced into sheets, and then used to cover full-thickness wounds. They are used primarily to treat burns.

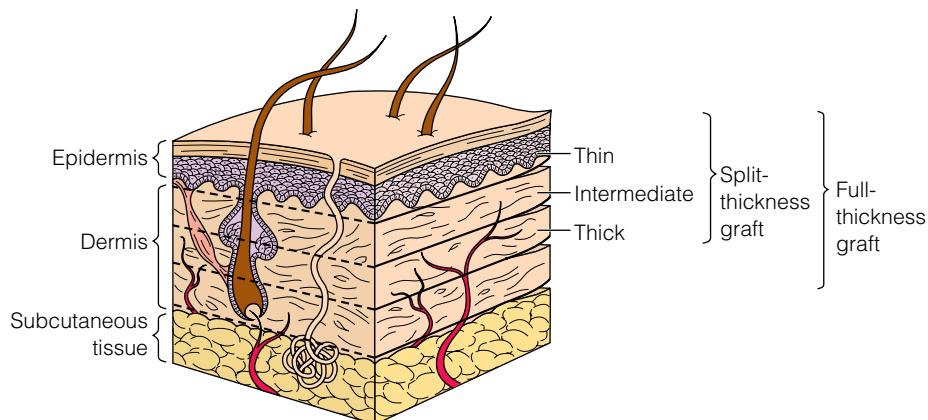


Figure 16–20 ■ Skin depth of split-thickness and full-thickness grafts.

A *skin flap* is a piece of tissue whose free end is moved from a donor site to a recipient site while maintaining a continuous blood supply through its connection at the base or pedicle. Flaps carry their own blood supply and are therefore used to cover recipient sites that have a poor blood supply or have sustained a major tissue loss. They are often used for reconstruction or closure of large wounds. Microsurgical techniques, with anastomosis of small blood vessels and nerves, allow reconstruction with free flaps (in which the flap is completely removed from its donor site and moved to the recipient site).

### Chemical Peeling

Chemical peeling is the application of a chemical to produce a controlled and predictable injury that alters the anatomy of the epidermis and superficial dermis. The result is skin that appears firmer, smoother, and less wrinkled. This form of cosmetic surgery is more useful in people who have fair, thin skin with fine wrinkling.

Chemical agents used for peeling include phenol, trichloroacetic acid (TCA), and alpha-hydroxy acids (AHAs). Phenol, a keratocoagulant, penetrates the epidermis and dermis; regeneration of the epithelium produces the desired results. After treatment, the entire surface of the face except the eyelids is covered with adhesive tape for 1 to 2 days. The adhesive is then removed, and the treated area forms a crust that heals in about a week. TCA has been used for years to obtain the desired effect. A light peel causes mild erythema followed by peeling (as from a mild sunburn) in 3 to 5 days. AHAs are organic acids used to produce light to moderate peeling to remove acne, fine lines, seborrheic keratosis, warts, and mild scarring. Both TCA and AHA treatments may be repeated weekly. One complication of chemical peeling is bleaching of the skin (due to removal of melanocytes).

### Liposuction

Liposuction is a method of changing the contours of the body by aspirating fat from the subcutaneous layer of tissue. This treatment is used to remove excess fat from the buttocks, flanks, abdomen, thighs, upper arms, knees, ankles, and chin. It is not a cure for obesity and should not be used as a substitute for weight loss. The procedure is usually done for younger clients because their skin is more elastic. Liposuction may be performed on either an outpatient or inpatient basis.

To aspirate the fat, a small incision is made close to the area, and a suction cannula or curette is inserted and attached to a suction apparatus. The high vacuum pressure caused by the suction machine causes fat cells to emulsify, and they are aspirated out of the body. Following removal of the fat, a pressure dressing is applied to help the skin conform to the new tissue size.

### Dermabrasion

Dermabrasion is a method of removing facial scars, severe acne, and pigment from unwanted tattoos. The area is sprayed with a chemical to cause light freezing and is then abraded with sandpaper or a revolving wire brush to remove the epidermis and a portion of the dermis.

### Facial Cosmetic Surgery

Many different reconstructive surgeries may be performed to correct deformities or improve cosmetic appearance. Those

discussed here are rhinoplasty, blepharoplasty, and rhytidectomy (facelift).

- A *rhinoplasty* is conducted to improve the appearance of the external nose. The nasal skeleton is reshaped, and the overlying skin and subcutaneous tissue are allowed to redrape over the new framework. A submucous resection of the nasal septum is often done at the same time; this surgery resects a segment of the septal cartilage to improve the nasal airway and also to alter the appearance of the nose. This surgery is done through incisions within the nose, so no visible scars remain after healing.
- A *blepharoplasty* is a cosmetic surgery in which loose skin and protruding periorbital fat is removed from the upper and lower eyelids. With aging, the eyelid skin sags, allowing the periorbital fat to bulge; the skin of the upper eyelid can be so lax that it partially obstructs vision. The procedure is performed under local anesthesia, and excess skin and fat are excised. The incision is made in the normal eyelid lines so that scars are not visible after healing.
- A *rhytidectomy*, or facelift, is a cosmetic surgery done to improve appearance by removing excess skin (and sometimes fat) from the face and neck. As one ages, the skin of the face and neck tends to become loose and wrinkled. The procedure is usually performed with local anesthesia. To perform the surgery, bilateral incisions are made from the scalp at the temple, in front of the ear in the natural skin line, around the ear lobe, and to the occipital scalp. The skin is then elevated, fat is removed or suctioned, and excess skin is excised. The incision lines are sutured, and a pressure dressing is applied.



## NURSING CARE

Nursing care for the client having cutaneous or plastic surgery is highly individualized. It depends on the type of surgery or procedure performed, the type of deficit treated, the reason for the surgery or procedure, the expected results of the treatment, and the response of the client to the lesion or surgery. Although some surgeries, such as skin grafts and flaps, require in-hospital care, many of the surgeries are carried out in the primary care setting, and the client provides self-care at home following or between treatments.

### Nursing Diagnoses and Interventions

Although a variety of nursing diagnoses may be appropriate for the client having cutaneous or plastic surgery or procedures, the most common are *Impaired Skin Integrity*, *Acute Pain*, and *Disturbed Body Image*.

#### Impaired Skin Integrity

The client having surgery of the skin has impaired skin integrity. Skin grafts and flaps are performed to repair large wounds, and it is necessary to inflict further wounds to collect the graft or flap from a donor site. Excisions and various cosmetic surgeries cause wounds. Skin is traumatized by freezing, chemicals, abrasion, sclerosing agents, electrical currents, and lasers. Although all of these treatment modalities are conducted to remove lesions, improve function, or improve appearance,



they first impair the integrity of the skin. These impairments increase the risk for infection, which would further impair the skin integrity and may negate the benefits of surgery.

Nurses provide preoperative care and teaching, intraoperative assistance, and postoperative care and teaching; in each case, care and teaching are specific to the type of surgical treatment and the individual client. In all cases, the nurse provides appropriate preoperative interventions to prepare the client physically and emotionally for surgery and the postoperative period.

The following interventions are appropriate for the client having inpatient skin grafts or flaps:

- Monitor incisions and grafts, and flap donor and recipient sites, for manifestations of infection and necrosis:
  - Take and record vital signs every 4 hours.
  - Monitor all wounds for changes in color, consistency, amount, and odor of drainage every 4 to 8 hours.
  - Monitor wounds for increased swelling, redness, and pain every 4 to 8 hours.
  - Monitor and document assessment of graft every 4 hours.
  - Monitor and document temperature, turgor, color, dermal bleeding, and capillary refill of flaps every 4 hours.

*When bacterial infection is present, the inflammatory phase of wound healing is prolonged, retarding healing. Increased body temperature and tachycardia are manifestations of infection. The drainage in wounds that become infected is often increased in amount, purulent, thicker, and has a musty or foul odor. Tissue response to infection includes edema, increased erythema, and pain. Grafts and flaps that do not have adequate blood supply will appear black instead of the normal pink-red color.*

- Provide care for the donor site:
  - Position the client to minimize pressure on the donor site.
  - Use a bed cradle to keep linens off the area.
  - If the donor site is left open and a heat lamp is to be applied to the area, place the lamp no closer than 2 feet from the wound.
  - Avoid moving the body part containing the donor site, if possible.
  - If the donor site is on the posterior portion of the body, place the client on a special bed (such as a low-pressure or fluidized bed) to decrease pressure and allow air circulation around the donor site.

*Minimizing trauma from pressure and movement facilitates healing of the donor site. Leaving the site open to the air and providing heat increase healing. Special beds minimize ischemia and allow donor sites on the posterior side of the body to dry.*

- Encourage a diet high in protein, ascorbic acid, vitamins, and minerals. *An adequate protein intake is necessary to supply amino acids for tissue repair. Vitamin C is necessary for collagen formation and wound strength. Vitamins and minerals contribute to the healing process.*
- Change dressings as prescribed, or if the frequency is not indicated, as necessary. Determine which dressings are not to be removed during the healing process and which are to be changed, and whether the wound is to be kept dry or moist.
  - Use aseptic technique and follow standard precautions when changing dressings.

- Remove old dressings carefully and gently.
- Choose the appropriate dressing materials.

*Donor sites may be covered with an adherent gauze dressing that is allowed to dry and remains adherent through the healing process. Aseptic techniques prevent secondary bacterial infections. Standard precautions protect the nurse from HIV infection. Unless care is taken, the removal of adherent old dressings may damage the wound by traumatizing granulation tissue or wound edges. The use of semipermeable transparent dressings provides an environment that optimizes wound healing by promoting collagen synthesis and the formation of granulation tissue; it also increases cell migration and epithelial resurfacing and prevents the formation of scabs, crusts, and eschar.*

### Acute Pain

The client having a graft or flap has two wounds; in fact, the donor site may be more painful than the recipient site. Cutaneous surgeries, dermabrasions, and chemical treatments result in blistering, swelling, and loss of epidermal tissue. The client having facial reconstructive surgery has edema, with resultant pain.

- Administer pain medications on a regular basis, following guidelines for controlling pain in clients having operative procedures (see Chapter 9 ∞). *Established, severe pain is difficult to control and has negative physical and psychologic consequences.*
- Use alternative pain relief measures as appropriate and prescribed, such as ice bags or cold compresses. *Cold reduces swelling, acts as a local anesthetic, and decreases pain.*
- Teach noninvasive methods of pain relief, such as deep breathing, relaxation, and guided imagery. *Noninvasive methods of pain relief increase the effectiveness of pain medications and also allow the client some control and self-management of pain.*

### Disturbed Body Image

Cosmetic surgery is performed for a variety of reasons in adult clients of all ages. Changes in appearance, especially in a society that values youth and beauty, affect one's self-perception. Lesions or scars, especially of the face, may decrease self-esteem and cause a person to avoid social interactions and relationships. With aging, the skin becomes looser and wrinkles appear; this can be a source of anxiety and despair, especially to the woman who has always prided herself on her youthful appearance. Most clients cite one reason for having plastic surgery: to "feel better about myself."

- Provide preoperative teaching:
  - Explain that bruising and swelling will be present and that it will be several weeks before these responses to surgery disappear.
  - Explain that it may take a year for healing to complete and the final results to appear.

*Expectations differ; many people expect immediate results. Knowledge of postoperative responses is necessary for the client to adapt to change. The client may need to make arrangements to take time off from work during the initial healing stage.*

- Provide time for the client to verbalize feelings and concerns. Be empathetic, and listen nonjudgmentally. *Such nurse–client interaction facilitates acceptance of changes in body image.*
- Refer to a consultant who can provide information on the use of cosmetics and apparel to enhance personal appearance. *Knowledgeable use of cosmetics and clothing can make scars much less noticeable. If the client feels better about appearance, body image is improved.*

## Community-Based Care

The nurse teaches the client and family to provide self-care at home after cutaneous and plastic surgery and procedures. The nurse asks about the client's expectations and stresses that final results will not be seen for several months, providing written instructions about the following topics:

- Wound care, including application of topical medications and dressing changes. If the client is to return to the office or clinic for removal of tape or pressure dressings, or for dressing
- changes in the first weeks after surgery, an appointment is made. For some procedures, the wound is left open to the air.
- Manifestations of wound infection, such as increased temperature, malaise, changes in the appearance of the wound, or changes in drainage. If any of these manifestations occur, the client should notify the healthcare provider immediately.
- Specific care for the type of surgery or procedure, such as type of oral care, avoiding blowing the nose, or limiting talking.
- Limitations on physical activity, especially lifting or straining.
- When to resume bathing or showering, shampooing the hair, and using cosmetics.
- The need to avoid picking at crusts or scabs. If the healing wound itches, the client should contact the healthcare provider for a topical medication.
- Use of a 15 (or higher) SPF sunblock when the client is outdoors. This may be prescribed for several months or for the rest of the client's life.

## HAIR AND NAIL DISORDERS

Disorders of the hair and nails are not serious threats to health, but they may cause embarrassment and a negative body image. Changes in hair growth and pattern as in nail growth and character occur as secondary responses to other illnesses or treatments and are also a part of the aging process.

### THE CLIENT WITH A DISORDER OF THE HAIR

Racial characteristics and gender influence the amount and type of hair. Caucasians typically have more facial and body hair than do Asians. People of Mongolian or Native American descent usually have straight hair, those of African descent have wavy to curly hair, and Caucasians have straight to curly hair. In addition, male hair growth characteristics (such as facial hair and hair on the lower extremities) are normal in certain women of some races and families. Women do not normally become bald.

The hair grows at various rates. Facial hair grows the most rapidly, followed by the hair of the scalp, axillae, thighs, and eyebrows. Normally, an adult's hair grows at a rate of 10 to 12 mm per month; however, the growth rate is influenced by both the person's state of health and the environment (hair grows faster in hot climates, more slowly in cold climates).

### Pathophysiology

Hair color, growth, and pattern vary from person to person, and they are determined largely by genetic inheritance. However, changes do occur. For example, in some instances, hair loss recurs in successive generations of males in a family; in other cases, hair loss may be the result of chemotherapy. Excessive facial hair may be a response to certain endocrine disorders or to the loss of estrogen after menopause. These changes may seem minor, but they may create psychosocial problems for the person experiencing the changes.

### Hirsutism

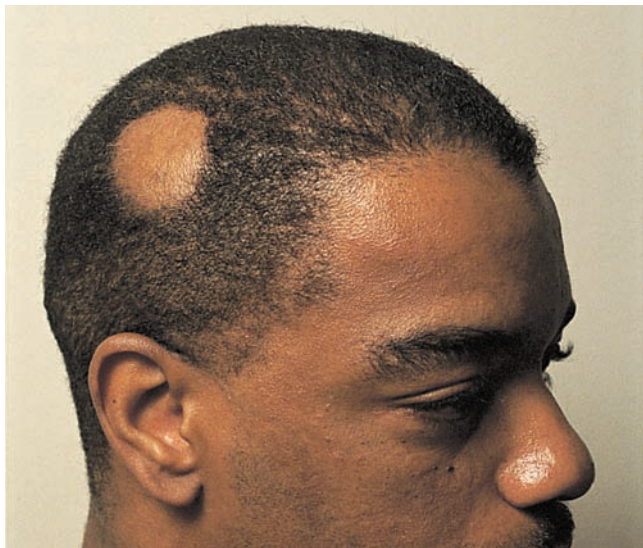
Hirsutism, also called hypertrichosis, is the appearance of excessive hair in normal and abnormal areas of the body in women. Hirsutism most often occurs in a male distribution (that is, on the upper lip, chin, abdomen, and chest) in women. The excess hair is primarily the result of an increase in androgen levels (especially testosterone), which may be due to any of the following:

- Familial predisposition (considered normal)
- Polycystic ovary syndrome
- Ovarian, adrenal, or pituitary tumors
- Cushing's syndrome
- Central nervous system disorders
- Medications, such as minoxidil, cyclosporine, phenytoin, certain progestins, and anabolic steroids.

The manifestations of hirsutism include increased male pattern hair growth, acne, and menstrual irregularities. If the androgen excess is great, defeminization (a decrease in breast size and loss of normal adipose tissue) and virilization (frontal balding, increased muscle mass, deepening of the voice, and enlargement of the clitoris) may occur. Virilization indicates the presence of an androgen-producing tumor.

### Alopecia

Alopecia is loss of hair, or baldness (Figure 16–21 ■). Alopecia may result from scarring, various systemic diseases, or genetic predisposition. Scarring from trauma, radiation, and severe bacterial, fungal, or viral infections causes permanent and irreversible hair loss over the scarred area. Systemic diseases that may cause alopecia include systemic lupus erythematosus, thyroid disorders, and pituitary insufficiency. The hair loss from these disorders may be reversible. Hair loss from androgenic causes may also occur in the postmenopausal woman. Alopecia may be drug induced and is a side effect of a variety of medications (Box 16–10).



**Figure 16–21** ■ Alopecia (baldness) may be the result of scarring, disease, or genetic predisposition.

Types of alopecia follow:

- Male pattern baldness is the most common cause of alopecia in men and is genetically predetermined. The hair loss begins at the temples, with recession of the hairline and baldness of the crown.
- Female pattern alopecia begins in women in their 20s and 30s, with progressive thinning and loss of hair over the central part of the scalp. Unlike men, women do not lose hair from the frontal hairline. Many of these women have elevated adrenal androgens.
- Alopecia areata is characterized by round or oval bald patches on the scalp as well as on other hairy parts of the body. The cause is unknown. This type of alopecia is usually self-limiting and reverses without treatment, although it often recurs.
- Alopecia totalis is the loss of all hair on the scalp. This rare condition is irreversible.
- Alopecia universalis is the total loss of hair on all parts of the body.

## INTERDISCIPLINARY CARE

Alopecia is diagnosed by assessing the appearance of the hair and hair loss and by assessing the client for other systemic diseases and the use of medications that may cause hair loss. Various treatments are used to restore hair.

### BOX 16–10 Medications Causing Alopecia

- |                              |                |
|------------------------------|----------------|
| ■ Thallium                   | ■ Allopurinol  |
| ■ Retinoids                  | ■ Propranolol  |
| ■ Anticoagulants             | ■ Indomethacin |
| ■ Antimitotic agents         | ■ Amphetamines |
| ■ Antithyroid drugs          | ■ Salicylates  |
| ■ Oral contraceptives        | ■ Levodopa     |
| ■ Trimethadione              | ■ Gentamicin   |
| ■ Excessive use of vitamin A | ■ Chemotherapy |

The client with hirsutism is examined for hormone levels and indications of other systemic illnesses. Hirsutism is treated by addressing the underlying systemic disorder and stopping medications that may be causing the problem.

## Diagnosis

Diagnostic tests that may be ordered for the woman with hirsutism include serum testosterone levels and an adrenal CT scan. Testosterone levels are measured, and levels greater than 200 ng/dL indicate the need for further tests, such as a pelvic examination and tests of ovarian function. Adrenal tumors, a possible cause of hirsutism, are identified with an adrenal CT scan.

## Medications

Hirsutism is treated with medications specific to the underlying cause. Oral contraceptives containing estrogen decrease ovarian androgen production and decrease free testosterone levels. Dexamethasone (Decadron) may be prescribed for people with high cortisol levels. Ketoconazole (Nizoral) inhibits androgen production. Antiandrogenic medications cause congenital abnormalities in male infants and are therefore given only to non-pregnant women, who are cautioned to avoid pregnancy while taking the medications.

Male pattern baldness has been successfully treated with topical minoxidil (Loniten) or Rogaine, a commercial product that contains minoxidil. These drugs, which are vasodilators, stimulate vertex hair growth, probably by stimulating the epithelium of the hair follicle. These agents have been most successful in clients who have a recent onset of alopecia or are less than 50 years old. About 40% of clients treated two times a day for a year will have moderate to dense regrowth of hair at the temples (McPhee et al., 2007).

## Surgery

Hair transplant techniques are used to restore hair or reduce the size of areas of alopecia. Other types of surgical procedures include scalp reduction and flaps.

- Transplanting hairs as small hair plugs or single hairs taken from the back or sides of the scalp is an effective means of replacing hair to areas of alopecia. This procedure is done in an outpatient office or clinic.
- Scalp reduction is done by excising a portion of the affected scalp. In some cases, a tissue expander (such as a silicone balloon) is first implanted under the scalp to enlarge the hair-bearing scalp so that larger areas of alopecia can be removed.
- Flaps from hair-bearing areas of the scalp can be surgically transplanted from adjacent areas into areas of alopecia. This procedure may be done in stages.



## NURSING CARE

The client with either hirsutism or alopecia is often self-conscious about appearance and tries a variety of OTC treatments before seeking medical care. Nursing care for the client with hair disorders focuses on teaching the client self-care and providing support during long-term care. Women with hirsutism are taught to use various means of removing unwanted hair, such as shaving, applying depilatories, waxing,



undergoing electrolysis, or having laser treatments. Women with mild hirsutism may bleach facial hair to make it less obvious. Clients with alopecia may wear hair pieces or wigs.

## THE CLIENT WITH A DISORDER OF THE NAILS

Nail disorders may be due to systemic diseases, trauma, allergies, or irritants. They may also be congenital or genetic. Nails may be discolored, multicolored, malformed, infected, or separated from underlying tissue.

### Pathophysiology

The nail disorders discussed here are separation of the nail, infection, and ingrown toenails:

- *Onycholysis* is the separation of the distal nail plate from the nail bed. It occurs most often in the fingernails. This disorder may result from many different factors, including excessive or prolonged exposure to water, soaps, detergent, alkalis, and industrial keratolytic agents; *Candida* infections; nail hardeners; and thyroid disorders. Prolonged application of false fingernails may also cause this disorder.
- A **paronychia** is an infection of the cuticle of the fingernails or toenails. The disorder often follows a minor trauma and secondary infection with staphylococci, streptococci, or *Candida*. The acute form begins with a painful inflammation that may progress to an abscess. The chronic form is seen most often in people who have frequent exposure to water. In the chronic form, the skin around the nail is painful, edematous, and infected. The nail plate may become ridged and discolored.

- An *onychomycosis* is a fungal or dermatophyte infection of the nail plate. The nail plate elevates and becomes yellow or white. Psoriasis infections of the nail plate cause the nails to pit.
- An *ingrown toenail* (*unguis incarnatus*) results when the edge of the nail plate grows into the soft tissue of the toe. Pain and infection may occur. The infection, if untreated, may spread to the bone. This disorder is especially dangerous for the person with diabetes mellitus or peripheral vascular disease.

## INTERDISCIPLINARY CARE

The treatments of disorders of the nail vary from pharmacologic treatment to surgical removal. Infections of the nails are treated, depending on the causative agent, with antifungal or antibiotic medications. If the causative agent is a fungus or chronic dermatologic disorder, treatment is difficult and may not be effective. Persistently painful and/or infected nails are in some cases surgically removed.



## NURSING CARE

Nursing care of the client with a disorder of the nail focuses on teaching self-care. Clients with nail disorders that are caused by frequent exposure to water are taught to protect the hands or feet by wearing rubber gloves or boots and to keep the nails as clean and dry as possible. Clients with ingrown toenails are cautioned not to cut into the lateral nail bed, but rather to soak the nail twice a day and insert a piece of cotton or gauze under the softened nail until the nail has grown out enough to trim.

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Audio Glossary  
NCLEX-RN® Review  
Care Plan Activity: Pressure Ulcers  
Case Study: Lesions and Pruritis  
MediaLink Applications  
Links to Resources

## CHAPTER HIGHLIGHTS

- Pruritus (itching) accompanies dry skin (xerosis) and many skin disorders and may result in excoriation and infection as a result of scratching.
- Cysts, keloids, nevi, angiomas, skin tags, and keratoses are benign skin lesions. However, nevi should be monitored for changes indicating transformation into a malignant lesion.
- Psoriasis is a chronic immune skin disorder arising from keratinocytes. A variety of medications and treatments are used, with ultraviolet light therapy being most effective for generalized lesions.
- Skin disorders may be caused by a variety of bacterial infections, fungal infections, parasitic infestations, and viral infections.



The disorders are treated with a specific antibiotic, fungicide, antiviral agent, or agents that kill the parasites. Herpes zoster, believed to follow a childhood infection with chickenpox, causes acute pain.

- Inflammatory disorders of the skin range from mild dermatitis to potentially lethal toxic epidermal necrolysis. Acne, a disorder of the hair and sebaceous glands opening to the skin surface, is characterized by comedones, pustules, and cysts.
- Malignant skin disorders include actinic keratosis, nonmelanoma skin cancer (basal cell cancer and squamous cell cancer), and malignant melanoma skin cancer. Skin cancer is the most common malignancy found in fair-skinned Americans. Prevention by

avoiding sunburn, using sunscreen, and maintaining monthly skin self-examination is critical in preventing loss of tissue or metastasis and death.

- Skin trauma may be intentional (as in the case of cutaneous and plastic surgery) or unintentional (as from trauma, frostbite, and pressure). Older adults with limited mobility, as well as clients who are unable to move or are in critical care units, are at greater risk for pressure ulcers. Prevention is the goal of both interdisciplinary and nursing care.
- Disorders of the hair include alopecia (loss of hair) and hirsutism (excess hair in women). Nails may be discolored, multicolored, malformed, infected, or separated from underlying tissue.

## TEST YOURSELF NCLEX-RN® REVIEW

- 1 Your elderly client has severe xerosis. What topic should be included in your teaching plan?
  1. Take a hot bath every day.
  2. Use fabric softeners when laundering clothing.
  3. Apply skin lotions after a bath.
  4. Maintain a warm environment.
- 2 Which of the following common skin lesions has the potential of becoming malignant?
  1. nevi
  2. angiomas
  3. skin tags
  4. keloids
- 3 You have been asked to teach a woman with generalized psoriasis about ultraviolet light therapy (UVB). What should be included in teaching?
  1. "The exact effect of UVB is unknown, but it decreases severe itching."
  2. "When combined with hot baths, UVB is very effective."
  3. "Treatments with UVB have to be given in the hospital to be safe."
  4. "UVB slows the growth of epidermal cells and decreases keratosis."
- 4 Which of the following clients is at risk for the development of a candidiasis infection?
  1. an older adult with pruritus
  2. a young woman who is pregnant
  3. an older man with a premalignant skin condition
  4. a young man with multiple nevi
- 5 What question should be included in a health history of a client with a linear pattern of painful vesicles over the left thorax?
  1. Do you remember being sunburned as a child?
  2. Are you a regular patron of tanning booths?
  3. Have you ever been diagnosed with acne?
  4. Did you have chickenpox when you were young?
- 6 Which of the following statements is true of an infestation with lice?
  1. Only dirty people have lice.
  2. Anyone can have lice.
  3. Lice do not like to live on humans.
  4. Lice are a form of fungus.
- 7 Which assessments would indicate a greater risk to develop a nonmelanoma skin cancer?
  1. blond hair, freckles, fair skin
  2. alopecia, thin hair, itching
  3. dark hair, dark skin, dry skin
  4. tanned skin, dark hair, edema
- 8 Of the following, which is most significant to the development of a malignant melanoma?
  1. a change in the color or size of a nevus
  2. sexual contact with a person who has a herpes virus infection
  3. inadequate knowledge about infection prevention
  4. a dietary intake of high-calorie foods
- 9 The rationale for lifting, rather than pulling, a client up in bed is that:
  1. lifting a client allows a brief period of increased capillary circulation.
  2. lifting a client prevents tissue injury from shearing forces.
  3. pulling a client up in bed decreases tissue ischemia and hypoxia.
  4. pulling a client up in bed promotes capillary blood flow.
- 10 You are caring for a young adult with acne scars. He asks about treatment to reduce the scarring. Which of the following might you discuss?
  1. liposuction
  2. skin flap
  3. dermabrasion
  4. blepharoplasty

See Test Yourself answers in Appendix C.

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