Chapter 5

Integumentary Disorders

Anatomy and Physiology Review of the Integumentary System

The skin, long recognized as the largest organ, is responsible for providing the first line of defense to the entire body. While many body systems interact closely, the skin is a highly dynamic structure that achieves many specific functions within its individual structures. These functions include:

- Preventing fluid loss
- Providing a barrier to invading organisms
- Relaying sensations of touch, temperature, and pain
- Regulating body temperature and blood pressure
- Synthesizing vitamin D
- Excreting sweat, urea, and lactic acid

Skin

The skin structure is comprised of the epidermis, the dermis, and the subcutaneous tissue (see **Figure 5-1**). The functional layers are clearly stratified; however, they may vary in depth depending upon location in the body.

The **epidermis** is the outermost, avascular layer of the skin. It contains four to five layers: stratum corneum, stratum lucidum (mostly found in skin on the hands and feet), stratum granulosum, stratum spinosum, and stratum germinativum. Keratinocytes, found in the basal layer (stratum germinativum), produce and synthesize waterproof protein keratin cells, which protect the skin. The early germinal keratinocytes multiply and migrate upward in an unorganized fashion through the epidermal layers until they lose their nucleus and form the tough layer of dead keratinocytes of the stratum corneum. The average epidermis differentiates upward from the basal layer to the stratum corneum every 30 days. After 14 days, the topmost level sheds and is replaced with the next level. In addition to keratinocytes, the epidermis contains melanocytes, pigment-producing cells that give skin its color.

Sometimes referred to as the "true" skin, the **dermis** is composed of two layers: a thin upper layer, the papillary dermis, and a thicker lower layer, the reticular dermis. The reticular dermis lies between the papillary dermis and the subcutaneous tissue. As a connective tissue layer, the dermis provides strength and stability. The fibrous matrix of collagen and elastin is set in a disorganized fashion so that movement and resistance can occur. The dermis is composed of cells, nerves, and blood vessels. Most hair follicles originate in this level.

The **subcutaneous layer** of skin, which binds the dermis to underlying body tissue, is composed of fat and connective tissues. Some sweat glands and deep hair follicles extend into this layer of skin. Adipose deposition provides a cushioning base for the subcutaneous layer.

Skin Appendages

In addition to the layered skin, the skin appendages—the nails, hair, eccrine glands, and apocrine glands—make up the full complement of the integument.

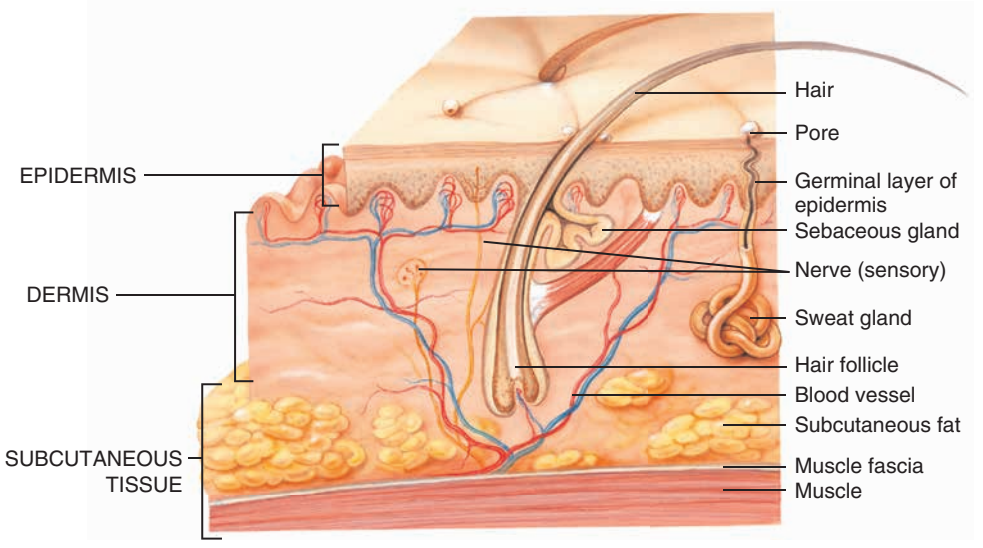


FIGURE 5-1 Structure of the skin.

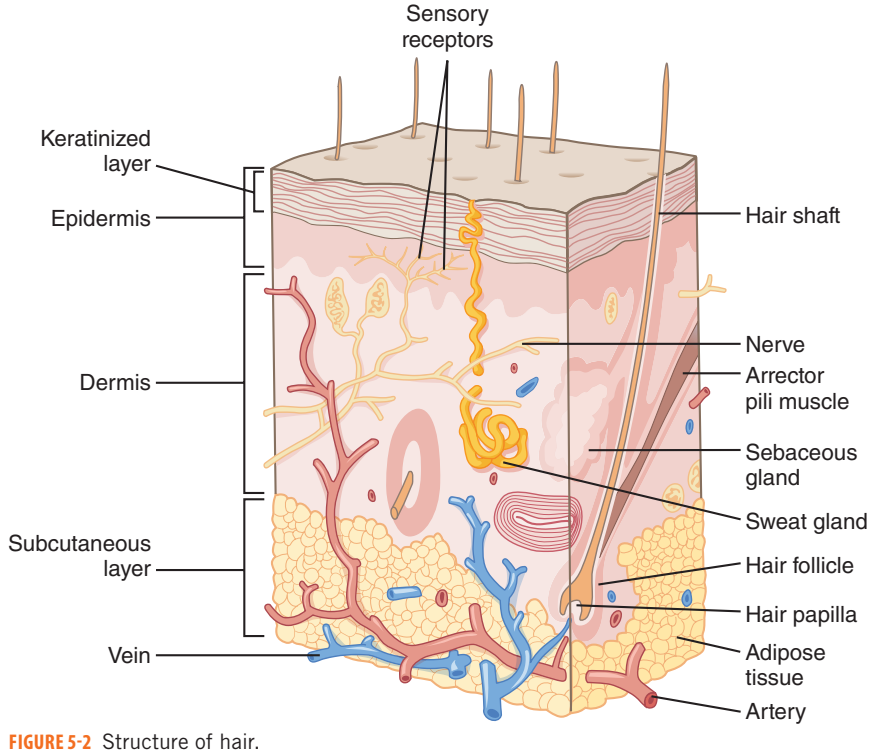


FIGURE 5-2 Structure of hair.

Hair

The structure of hair consists of the follicle, shaft, sebaceous gland, and arrector pili muscle (**Figure 5-2**). Blood vessels in the hair papilla in the bulb nourish and maintain the follicle. As with the skin, melanocytes, found in the bulb, provide the color.

The hair shaft is a shaft of dead protein. It originates in the living cells of the matrix, which then multiply and arise from the hair follicle. The hair growth cycle continuously evolves through three

stages: the anagen (growth) stage, the catagen (transitional follicular regression) stage, and telogen (resting) stage. Recognizing the hair biology and growth phases of hair aids in the understanding of the hair loss disorders.

Nails

Nails, found on the fingers and toes, are keratinized plates. The anatomy of the normal nail unit includes the hard keratin nail plate, the nail bed, the proximal nail fold, and nail matrix. Nails serve to protect the fingers and toes. They grow out of the nail groove. The nail matrix, the germinal region of the nail plate, forms the floor of the nail groove. The nail bed attaches the nail plate to the underlying epidermis.

Eccrine Glands

Eccrine sweat glands originate in the dermis. Under control of the hypothalamus, they regulate body temperature through water secretion and evaporation. They are distributed and open directly to the surface of the skin in all areas but the lip margins, nail beds, inner surface of the prepuce, and the glans penis.

Apocrine Glands

Apocrine glands are located deep in the dermal layer in the areas of the axilla, nipple, areola, eyelids, external ears, and in the anogenital regions. Apocrine secretions are clear and odorless and are released under cholinergic and hormonal control. When mixed with bacteria on the surface, the secretions produce body odor.

Health History

While much of assessing skin disorders is thought to be identification by recognition, good history taking, as in any other assessment, is crucial to the diagnosis. The immediate skin history cues the examiner to the contributing or precipitating features of a skin problem. Careful history alerts the potential for localized as well as general disease.

Chief Complaint and History of Present Illness

"I've got spots, and I'm itchy everywhere."

> LK is a 42-year-old man who presents with a 3-week history of erythematous papules and plaques of the lower anterior, medial, and lateral legs that have developed slowly and persisted. The condition worsened while using an over-the-counter neomycin antibiotic ointment. He has since discontinued use of the ointment and his legs have slightly improved. Mr. K has experienced recurrent similar episodes. He complains of moderate lower leg pruritus. Slight tenderness and straw-colored, odorless drainage has developed over the past 5 days. The patient describes other scattered pruritic areas of the arms and back as severe. He denies chemical exposure at work or in or outside of his home. He has not traveled or been exposed to persons with similar problems. He denies changes in the appearance of hair or nails.

Growths, rashes, and pruritus are common dermatologic complaints.

Lesions/Rashes

Any growth should be evaluated for potential malignancy. Any complaint of a "spot," especially in a new patient, requires a thorough history and risk factor evaluation. Histologic evaluation (biopsy) may be performed whenever there is clinical suspicion of skin malignancy or neoplasm of undetermined origin. Rashes are particularly puzzling and should be systematically evaluated. History of morphologic presentation/changes, as well as major constitutional symptoms of fever, chill, lethargy, and toxic appearance, are important.

Onset	Was the onset sudden or gradual?
Duration	How long has the lesion or rash been present?
Quantity and location	Does the patient have a single lesion or multiple lesions? Where is/are the lesion(s) located? *Rash or lesions confined to the genital area suggest a sexually transmitted disease.* *Herpes zoster is commonly confined to the thoracic, trigeminal, and lumbosacral areas.* *Impetigo is most often found on the face.* *Rosacea is usually confined to the middle third of the face.*
Quality	Describe the size, shape, elevation, and color of the lesion. Ask about exudate, crusting, and pain.
Changes in quality since onset	Has the size, shape, elevation, location, or color changed since the onset? *Varicella (chickenpox) begins as red macules and quickly progresses to papules and vesicles to crusts. Varicella, rubella (German measles), and rubeola (measles) usually begin on the face and spread to the trunk and extremities.*
Associated symptoms	Ask about associated symptoms including fever, pruritus, malaise, headache, chills, and anorexia. *Fever, malaise, and anorexia are often seen in varicella. Patients with mumps often experience headache, anorexia, and fever.* *In addition to the rash, patients with rubeola often present with fever, cough, and fatigue.*
Precipitating factors	Has the patient experienced a previous malignancy? Has the patient experienced any recent injuries or trauma to the skin? Has the patient traveled recently or been exposed to chemicals? *Exposure to chemicals may result in irritant contact dermatitis.* Has the patient recently spent time outdoors or been exposed to poison oak or ivy? Is the patient taking any medications? *An adverse reaction to a drug often manifests as a rash.* Has the patient eaten any new foods recently?
Alleviating and aggravating factors	What alleviates and aggravates the symptoms? Has the patient taken any medications? Has the patient applied any topical creams or gels? Have any other measures, such as applying heat or cold, alleviated the symptoms?

Pruritus

Pruritus (itching) is actually a form of pain. Many localized and generalized conditions present with the symptom of itch. In addition, pruritus is associated with many environmental factors, which should be evaluated as potential contributing features. Occasionally systemic illness may be associated with pruritus; therefore, a careful history must precede the physical examination.

Onset	Was the onset sudden or gradual?
Quality and location	Describe the intensity of the pruritus. Where is the patient experiencing pruritus?
Pattern and duration	Is the pruritus worse at night or during particular seasons? *Pruritus associated with scabies is often worse at night.*
Associated symptoms/ conditions	Ask about associated symptoms/conditions including rash or lesions, asthma, and allergies. *Patients with atopic dermatitis often have a history of asthma or chronic allergies.* *Pruritus often occurs at the site of a rash or lesion.*
Precipitating factors	Ask about the presence of insect bites or exposure to insects. *Many insect bites are very pruritic.* Is the patient taking any medications, specifically aspirin, hormones, opiates, phenothiazine, B_{12}, quinidine, CNS stimulants, beta blockers, or warfarin? Has the patient traveled recently?
Alleviating and aggravating factors	What alleviates the symptom (e.g., cold compresses, topical or oral medications)? What aggravates the pruritus (e.g., low humidity, certain fabrics, stress, cleansers)?
Bathing habits	How frequently does the patient bathe? What products does he use?

Past Medical History

> Mr. K has a 14-year history of generalized pruritus, often severe. He reports chronic, relapsing, localized, intensely pruritic lesions of the lower leg. He denies systemic diseases. Allergy patch testing was performed and, according to the patient, yielded no valuable results. The patient has tried multiple oral antihistamines; he currently takes none. The patient denies a history of childhood eczema, skin cancers, or precancers. He states that he had varicella as a child. Mr. K reports he is mildly tolerant to sunlight. He denies previous surgeries or blood transfusions.

Past medical history of the patient with a skin disease/disorder should be as comprehensive as that for any other medical complaint. Careful history reveals recurrences or flare patterns linked to triggers and modifying factors.

Past health conditions or surgeries	Ask about health conditions, including diabetes, thyroid or other endocrine dysfunction, HIV, atopic conditions (allergic asthma, hay fever, and eczema), and thromboembolism. *These conditions may provide a clue to skin diagnoses or may modify treatment of the skin. Related systemic complexes such as the immune response of allergy, asthma, and tissue inflammatory reaction are connected to atopic dermatitis (eczema), psoriasis, and viral infections.* Has the patient had any surgeries? *Previous medical treatments, surgery, and trauma interrupt the natural defense of the skin barrier, providing hospitable ground for infection and inflammation.*

Skin, hair, or nail conditions	Does the patient have or has the patient had any skin, hair, or nail disorders? Ask about treatment. Does the patient have a history of skin cancer or precancers? *A past history of skin cancer or precancerous dermatoses increases the patient's risk for skin cancer.* **Box 5-1** *provides additional risk factors for skin cancer.*
Tolerance to sunlight	Ask the patient about her or his tolerance to sunlight and history of sunburns. *The Fitzpatrick sun sensitivity skin typing scale* **(Table 5-1)** *is used as a tool for classifying skin type to provide uniform assessment of potential risk.* *One blistering sunburn causes a two-fold risk of developing melanoma.*
Allergy testing	Has the patient been tested for allergies?

BOX 5-1 SKIN CANCER RISK FACTORS

Men over age 50	Personal history of skin cancer
Blue or green eyes	Continuous exposure to sun at work or play
Blonde or red hair	Light skin that burns, freckles, or easily gets red
Family history of skin cancer	Certain types and larger number of moles

Table 5-1 Fitzpatrick Skin Type Classification

Type	Sun Reaction*
I	Always burns easily; never tans
II	Usually burns; tans minimally
III	Burns moderately; tans gradually
IV	Burns minimally; tans readily
V	Rarely burns; tans profusely
VI	Never burns; darkly pigmented

*Note: Reaction is based on 30 minutes of exposure to summer sun.

Family History

Mr. K has a negative family history of arthritis, eczema, psoriasis, heart disease, diabetes, and skin cancer. He is an only child; both parents are alive and well. His mother is sensitive to cosmetics and sunscreens and has a childhood history of itch and rashes. His parents and he all have fair skin and blue eyes.

Inherited color of eyes, hair, and skin tone reveal signs of the skin's natural protection or lack of it. Many skin disorders are familial or genetic, so it is important to explore the family history of such disorders.

Age of living relatives	Include relationship and health of parents, siblings, and children.
Deaths	Includes relationship of the deceased to the patient and cause of death (specifically disorders that affect the skin).
Chronic diseases; skin disorders	Ask about chronic diseases in the family; include the relationship of the patient to the family member with the disease. Focus on inherited skin disorders or disorders that have skin manifestations.

	Inherited skin disorders are divided into several broad classifications. The disorders of keratinization are attributed to X-linked ichthyosis or excessive scaling of the skin. Neurocutaneous disorders are isolated to chromosome 17 and are characteristically recognized in early life by café-au-lait patches. ***Mechanobullous*** *disorders, specifically epidermolysis bullosa, are caused by defects of keratin proteins and collagen genes that are responsible for structural integrity of the cells.* *Immune-mediated diseases such as atopic dermatitis, psoriasis, and seborrheic dermatitis are not inherited disorders specifically, but follow familial patterns. Decreased cell-mediated immunity may allow the skin to exhibit inflammation as a result of physical or emotional stressors.* *Family history relative to skin immune response includes asthma, hay fever, environmental allergens, and persistent rashes.*
Genetic defects	Is there a history of congenital birth defects?

Social History

> Mr. K does not smoke or drink. He is employed as a social worker. He lives in a single-family home with his wife and two children. Currently, 10 puppies, 1 dog, and 1 cat reside in the patient's home. He denies outdoor vocations or avocations. Mr. K reports that he wears an SPF of 15 when outdoors for prolonged periods. He had remote exposure to Agent Orange in Vietnam.

Cumulative exposure to ultraviolet radiation is the strongest predictor for lifetime risk for developing a skin cancer. Statistically, greater than half of all patients over age 60 will develop some form of cutaneous malignancy. Therefore, known risk factors should be evaluated (see Box 5-1). Aspects of a patient's social history provide pertinent information for determining his or her risk for skin cancer. For example, those who live in tropical climates and did not practice photoprotection have a greater incidence of skin cancers than their counterparts that reside in northern climates.

Family	Ask to describe current family unit.
Occupation	Ask about the patient's occupation. *Outdoor occupations with prolonged sun exposure, such as farmer and landscaper, greatly increase the risk for skin cancer.* *As few as three summers of outdoor employment are considered a risk, as is any repeated intense exposure that is more damaging than multiple chronic exposures.* *Certain occupations have exposure to chemicals.*
Hobbies	Ask about hobbies and activities. *Outdoor hobbies, such as golfing and sailing, involve increased sun exposure.*
Use of tobacco	Ask about tobacco use including types, amounts, duration of use, and exposure to secondary smoke. *Habits suppressive to the immune system, such as smoking, inhibit ability to repair cell damage after an intense ultraviolet exposure.*
Use of alcohol	Does the patient drink alcohol? If so, what type and how much does she drink? *Excessive consumption of alcohol increases the risk for skin cancer.*

Use of recreational drugs	Does the patient use recreational drugs? If so, what type and how much? *Drug use may cause skin-related problems. Amphetamine use can result in dry, itchy skin.*

Review of Systems

Many skin diseases/disorders have manifestations in systems other than the integumentary system. A comprehensive review of systems (see Chapter 1) should be performed whenever possible; however, due to time and other types of constraints, the provider may only be able to perform a focused review of systems. During a focused review of systems, the provider focuses questioning on the systems in which skin problems are most likely to have manifestations. Below is a summary of common manifestations of skin problems.

System	Symptom or Sign	Possible Associated Diseases/Disorders
General	Fever, malaise	Herpes zoster, varicella, erythema nodosum, roseola, rubéola
HEENT	Red eyes	Rosacea
	Conjunctivitis	Rubeola
	Upper respiratory infection symptoms	Erythema nodosum
Respiratory	Asthma, allergies Cough	Atopic dermatitis Rubeola
Cardiovascular	Varicosities, pedal edema	Stasis dermatitis
Gastrointestinal	Anorexia, abdominal pain	Roseola
Musculoskeletal	Arthritis, joint stiffness	Psoriasis, erythema infectiosum

Physical Examination

Equipment Needed

- Gloves
- Ruler
- Magnifying glass
- Good lighting source

Components of the Physical Examination

Inspection

It is important to be specific and descriptive about all skin findings. Recognition of primary and secondary skin lesions is the basis of the skin evaluation. Assessment begins with the identification of the basic skin lesion (primary) including description of size, shape, configuration, color, texture, elevation, depression, and pedunculation. Secondary lesions may be superimposed on the primary lesion, obscuring its identification, or may exist in the absence of a primary lesion. A systematic approach describing localized and generalized skin findings by morphology, arrangement, and distribution of specific skin findings increases the likelihood of arriving at an accurate diagnosis.

Visual examination should take place in a well-lit room allowing an appreciation of distribution and regional characteristics of lesions. Distinguishing features of primary lesions, examined with hand magnification when needed, are often sufficient to establish a diagnosis.

Diascopy, or the use of compression usually accomplished with a microscope slide, interrupts arteriole distention and can be helpful in identifying lesions of vascular origin. In areas of widespread discoloration caused by superficial engorged capillaries, application of diascopy forces blood out of surface vessels so that other colors in the skin are less visually obscured.

Action	Rationale
1. Begin with a general inspection of the overall skin. Observe general color.	1. Overall skin color should be consistent throughout and usually reflects the patient's genetic background. Patients with dark skin tones may have lighter skin tone on their palms and soles of their feet. Abnormal findings include regions of color change, such as pallor, cyanosis, erythema, or jaundice.
2. Inspect the skin for lesions (**Figure 5-3**).	

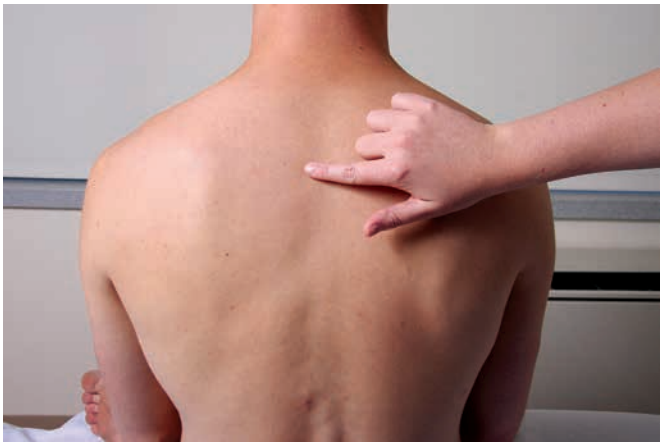
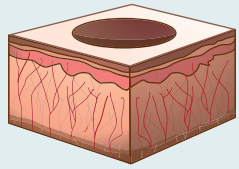
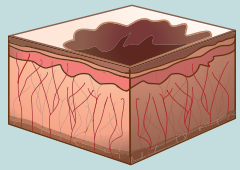
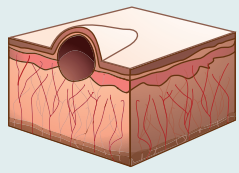
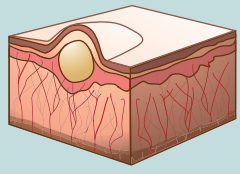
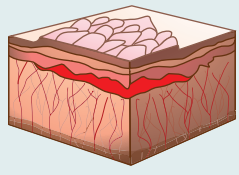
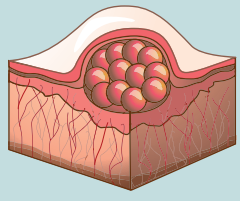
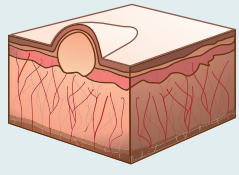


FIGURE 5-3 Inspecting for lesions.

a. Identify the morphology of the lesion, including elevation, shape, and size. Use a magnifying glass, as necessary. A ruler helps the examiner determine size.	a. Gross morphology, or the structure and form of a skin lesion, is the core of dermatologic diagnosis. Assessment begins with primary lesions. Secondary skin lesions are not pathologic, but are the result of manipulation or infection, or simply the natural evolution of the primary process. Occasionally, a pathologic lesion exists that cannot be described as primary or secondary. These special lesions are unique and readily identified. See **Tables 5-2**, **5-3**, and **5-4** for descriptions and examples of primary, secondary, and special lesions
b. Inspect the lesions for color and arrangement.	b. Critical thinking about skin lesion evaluation begins with the identification of size and elevation; the differential diagnosis quickly narrows with the consideration of color and arrangement. Multiple lesions in particular arrangements can be extremely helpful in providing specific pathognomonic signs of a particular disease. For example, the Christmas tree arrangement of pityriasis rosea or the dermatomal arrangement of herpes zoster is among the many important arrangement patterns. **Table 5-5** describes arrangement patterns with common examples.

Table 5-2 Primary Lesions

Type	Description	Examples	Illustration
Macule	< 1 cm in diameter, flat, non-palpable, circumscribed, discolored	Brown: freckle, junctional nevus, lentigo, melasma Blue: Mongolian spot, ochronosis Red: drug eruption, viral exanthema, secondary syphilis Hypopigmented: vitiligo, idiopathic guttate hypomelanosis	
Patch	> 1 cm in diameter, flat, non-palpable, irregular shape, discolored	Brown: larger freckle, junctional nevus, lentigo, melasma Blue: Mongolian spot, ochronosis Red: drug-eruption viral exanthema, secondary syphilis Hypopigmented: vitiligo, idiopathic guttate hypomelanosis	
Papule	< 1 cm in diameter, raised, palpable, firm	Flesh, white, or yellow: flat wart, milium, sebaceous hyperplasia, skin tag Blue or violaceous: venous lake, lichen planus, melanoma Brown: seborrheic keratosis, melanoma, dermatofibroma, nevi Red: acne, cherry angioma, early folliculitis, psoriasis, urticaria, eczema	
Nodule	> 1 cm in diameter, raised, solid	Wart, xanthoma, prurigo nodularis, neurofibromatosis	
Plaque	> 1 cm in diameter, raised, superficial, flat-topped, rough	Psoriasis, discoid lupus, tinea corporis, eczema, seborrheic dermatitis	
Tumor	Large nodule	Metastatic carcinoma, sporotrichosis	
Vesicle	< 1 cm in diameter, superficially raised, filled with serous fluid	Herpes simplex, herpes zoster, erythema multiforme, impetigo	

(*continues*)

Table 5-2 Primary Lesions (*continued*)

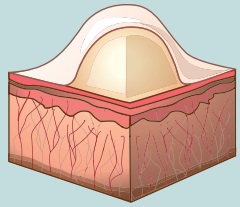
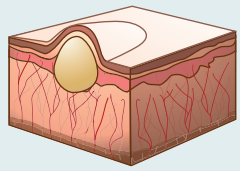
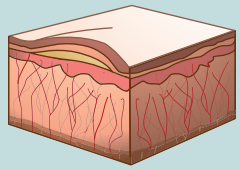
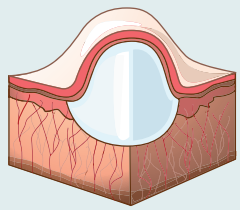
Type	Description	Examples	Illustration
Bulla	> 1 cm vesicle	Pemphigus, herpes gestationis, fixed drug eruption	
Pustule	Raised, superficial, filled with cloudy, purulent fluid	Acne, candidiasis, rosacea, impetigo, folliculitis	
Wheal	Raised, irregular area of edema, solid, transient, variable size	Hives, cholinergic urticaria, angioedema, dermatographism	
Cyst	Raised, circumscribed, encapsulated with a wall and lumen, filled with liquid or semisolid	Digital mucus, epidermal inclusion, pilar	

Table 5-3 Secondary Skin Lesions

Type	Description	Examples
Scale	Irregular formation of exfoliated, keratinized cells, irregular shape and size	Psoriasis, tinea versicolor, pityriasis rosea, seborrheic dermatitis
Crust	Dried serum, blood, or exudate, slightly elevated	Impetigo, tinea capitis, acute eczematous inflammation
Lichenification	Thickened epidermis with accentuated skin lines caused by rubbing	Lichen simplex chronicus
Scar	Thin or thick fibrous tissue, following dermal injury	Burns, acne, keloid, herpes zoster, hidradenitis
Fissure	Linear break in skin through epidermis and dermis	Hand dermatitis, intertrigo
Excoriation	Hollowed-out area of all or portion of epidermis with depressed appearance	Eczema, insect bite, acne excorié
Erosion	Localized loss of epidermis, heals without scarring	Herpes simplex, perléche
Ulcer	Loss of epidermis and dermis, variations in size	Decubitus or stasis ulcer, factitial ulcer, pyoderma gangrenosum
Atrophy	Depression resulting from loss of epidermis and/or dermis	Morphea, striae, aging, dermatomyositis, topical and intralesional steroids

Table 5-4 Special Skin Lesions

Type	Description	Examples
Burrow	A narrow, elevated channel produced by a parasite	Scabies
Telangiectasia	Superficial dilated blood vessel	Rosacea, side effect of topical steroid
Petechiae	< 1.0 cm circumscribed deposit of blood	Gonococcemia, meningococcemia
Purpura	> 1.0 cm circumscribed deposit of blood	Senile traumatic purpura

Table 5-5 Arrangement Patterns

Arrangement Pattern	Description	Examples
Nummular	Coin-shaped	Nummular eczema
Annular	Circular or ring shape	Tinea corporis
Linear	Line formation	Coupe de sabre
Arciform	Arch-shaped	Drug reaction
Grouped	Occurring closely together	Herpes zoster
Gyrate	Convoluted, serpiginous shape	Creeping eruption

Action	Rationale
c. Inspect for regional involvement and distribution.	**c.** Most skin diseases exhibit a preference for area of involvement. The structure, function, and physical nature of the skin in specific body regions are more favorable for some diseases. For example, opposing skin folds favor hidradenitis and candidiasis. Photo-exposed areas of the head and neck are frequent sites of skin malignancy, such as basal cell carcinoma (**Figure 5-4**) and squamous cell carcinoma (**Figure 5-5**). Areas of heavy follicular distribution, such as the chest and back, are subsequently prone to folliculitis and cystic structures.

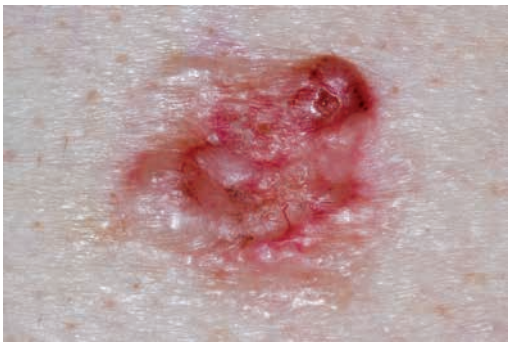


FIGURE 5-4 Basal cell carcinoma.

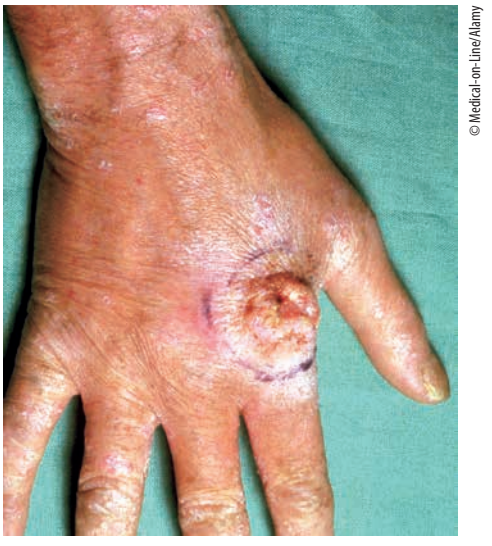


FIGURE 5-5 Squamous cell carcinoma.

Action	Rationale
	Similarly, the term *distribution* is used in describing skin findings. Terms of distribution commonly used in describing skin disease include generalized, localized, discrete, or confluent. While not always as helpful as a regional approach, certain distribution patterns such as the localized areas of involvement in allergic contact dermatitis are crucial characteristics of the diagnosis. Terms used to describe distribution patterns include flexor, extensor, and dermatomal.
3. Inspect the hair.	
a. Observe color, texture, and distribution.	**a.** If you find localized alopecia, assess for a scarring versus a nonscarring appearance. Scarring (cicatricial) alopecia is caused by diseases that destroy and scar the hair follicles. Smooth, shiny, scarred areas on the scalp with no obvious follicle visible suggest deep inflammatory conditions where the follicles are destroyed, such as discoid lupus erythematosus and lichen planus. Nonscarring alopecia found in singular or multiple patches may represent hair breakage as seen in traction alopecia and trichotillomania. Both result from manipulation, unlike the breakage of hair seen in tinea capitis that is caused by a fungal infection. Chronic conditions, such as diffuse androgenic alopecia (**Figure 5-6**), can develop insidiously during the second or third decade of life. With telogen effluvium, a generalized hair loss usually related to an internal stressor, evident hair loss begins 3 months after a stressful encounter. Alopecia areata (**Figure 5-7**), an autoimmune cell-mediated problem, may affect any hair-bearing surface and usually occurs as 1- to 5-cm round or oval patches of hair loss. Unexplained patchy hair loss, especially at the occiput, should always be evaluated as a secondary finding of syphilis.
b. Inspect the scalp for lesions or infestations.	**b.** Head lice (pediculosis capitis) lay white eggs on the hair shaft and cause severe pruritus.

Action	Rationale

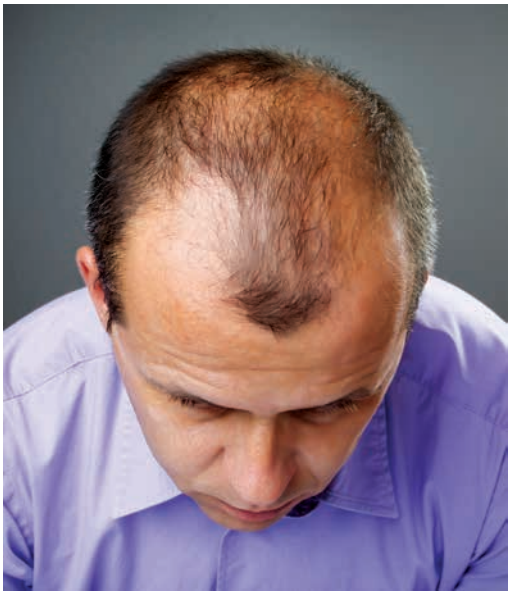


FIGURE 5-6 Androgenic alopecia.

FIGURE 5-7 Alopecia areata.

c. Note any excessive hair.

c. Hirsutism is excessive hair in females that occurs in regions where males commonly have hair, such as the beard area, upper back, shoulders, sternum, axillae, and pubis. Causes include endocrinologic disorders and androgen-related disorders (and therefore are related to the ovary). Polycystic ovary disease is the most common cause of hyperandrogenism and mild hirsutism. Serious disease should be considered in the presence of rapid progression of hirsutism, balding, and deepening of voice. If an extensive evaluation proves negative, hirsutism may be classified as idiopathic.

4. Inspect the nails.

a. Observe the consistency/texture. Note any separation of the plate from the nail bed.

a. Nail surface should be smooth and consistent. The nail plate should be adhered to the nail bed.

Longitudinal ridging (**Figure 5-8**) and loss of the lunula are age related and do not signal disease. Habitual picking may also cause distortion of the nail plate but does not interrupt the adherence of the nail.

Psoriasis usually presents with nail pitting (**Figure 5-9**), subungual thickening, and distortion.

Nails affected with lichen planus exhibit longitudinal grooves.

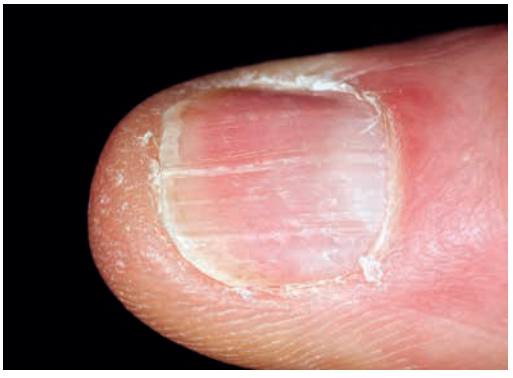
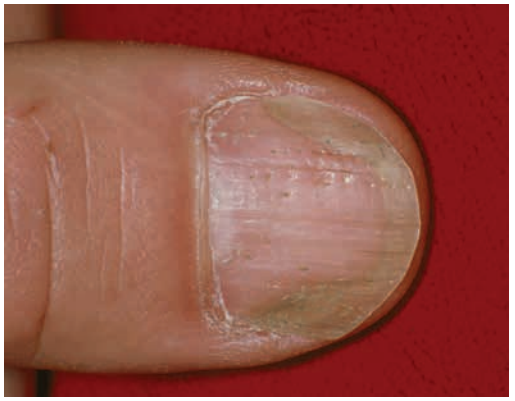


FIGURE 5-8 Longitudinal ridging, a normal finding associated with aging.

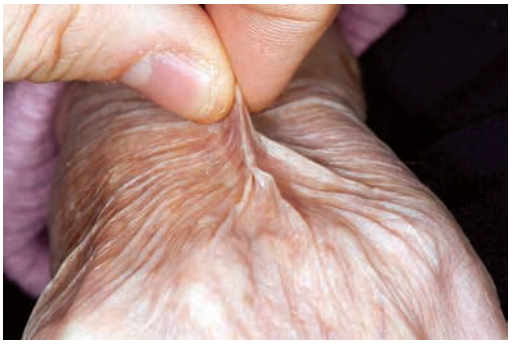
Action	Rationale
 **FIGURE 5-9** Nail pitting of psoriasis.	Fungal nail infections are described according to the pattern of the infection entry point; these include distal subungual onychomycosis (most common), white superficial onychomycosis, proximal subungual onychomycosis, and candidal onychomycosis. Thickening, opacification, nail crumbling, and distortion (dystrophy) are common exam findings of fungal infections. Diagnosis is made by performing KOH (potassium hydroxide) preparation, culturing of scrapings from under the nail plate, or nail biopsy for PAS (periodic acid-Schiff). Herpetic whitlow, a viral infection caused by transference of the herpes simplex virus (HSV) and frequently acquired by healthcare workers, can be exquisitely edematous and painful. Separation of the nail plate from the nail bed can occur after trauma or may be related to psoriasis or *Pseudomonas* infection.
b. Inspect nails for color.	**b.** The nails should be translucent, not opaque. Pigmented longitudinal bands are a common finding among blacks, but should be carefully evaluated for a differential diagnosis of acral melanoma. Candidal infection of the nail may be yellow-green in color but maintain the integrity of the nail plate. *Pseudomonas* infections, by contrast, most commonly present with a green-black discoloration and onycholysis of the nail plate.

Palpation

While much of the skin examination can be accomplished through visualization, valuable information maybe gained by palpating and manipulating the skin. The palpated epidermal and/or dermal features of a lesion can be demonstrated with relative ease, assisting in formulation of a diagnosis. Consistency, turgor, temperature, mobility, and tenderness are among the valuable findings of palpation. **Remember to wear gloves when palpating lesions and open skin.**

Action	Rationale
1. Assess the temperature, level of moisture, and texture of the patient's skin.	**1.** Skin should be cool or warm to the touch. The temperature of the examination room may affect the temperature. Skin should not be overly moist or dry. Overly moist skin may indicate temperature regulation problems. Dry skin may represent hyperthyroidism.

Action	Rationale
	Skin should feel smooth. Very rough skin could suggest a keratinization disorder. Extremely cracked or fissured skin may be chemically injured or xerotic. Very smooth or slightly depressed skin with absence of superficial features is usually a scar.
2. Test skin turgor (**Figure 5-10**). Gently pinch the patient's skin between your thumb and finger and then release it.	**2.** The skin should spring back into place.



© Dr. P. Marazzi/Science Source

FIGURE 5-10 Testing skin turgor.

3. Palpate lesions. Depending on the type of primary or secondary lesion identified during inspection, use the following technique.	
a. Squeeze or apply lateral pressure to localize the level of a lesion. The dermis is fibrous and can be picked up and moved over the subcutaneous nodules of deeper lesions of muscles or bone.	**a.** Squeezing can sometimes force fluid or semisolid matter out of the skin, which can help with diagnosis (i.e., squeezing an edematous extremity).
b. Scrape the skin surface to provide information about superficial lesions.	**b.** Dermatophyte and psoriasis plaques are of epidermal location and shed scale very easily when scraped with a #15 blade. Plaques of granuloma annulare that often mimic a dermatophyte do not shed scale when scratched. Thick crusts overlying ulcers can mask the depth of dermal involvement. Removal of surface crusts improves assessment.
c. Apply linear pressure or rub the skin surface with a blunt, narrow object to release the inflammatory mediators in cutaneous mast cell disorders exhibiting characteristic dermatographism or an urticarial wheal.	**c.** Lateral pressure applied to perilesional normal skin of active pemphigus blisters causes shearing away of the epidermis (Nikolsky's sign).
d. Use paring to aid in the differential diagnosis of corns and warts.	**d.** Paring the surface of a corn reveals a smooth, often shiny keratin kernel. A pared wart will exhibit small dark vessels.

Action	Rationale
4. Perform a hair pull test. Grasp about 60 hairs between the thumb and finger. Apply slow, constant traction.	4. Tractions against the scalp should not yield more than six hairs. If it does, inspect the bulbs for stage.
5. Palpate nails.	
a. Assess texture, temperature, and tenderness.	a. Nails should be smooth and firmly adhered to the nail bed. Palpation should not elicit tenderness. Bacterial infections of acute and chronic paronychia are easily distinguished by the warmth, tenderness, swelling, and erythema that are present.
b. Paring the nail bed may be helpful.	b. Paring the surface keratin of a nail enables the assessment of a nail bed, or confirms the presence of blood in a suspected subungual hematoma.

The distinguishing feature of a skin disease/condition is usually readily identifiable. If the primary lesion is accurately identified, most disorders can be recognized by hallmark features. **Tables 5-6** through **5-14** describe the hallmark features of many common skin disorders.

Table 5-6 Papulosquamous Diseases

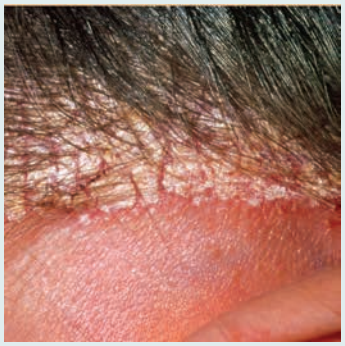
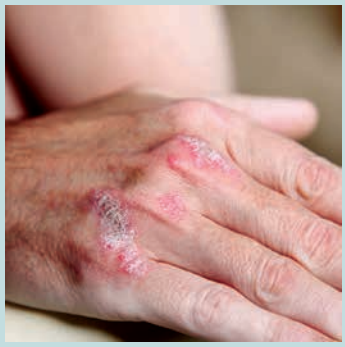
Diagnosis	Location of Lesions	Physical Examination Findings	Photograph
Seborrhea and dandruff	Head and trunk at sites of sebaceous gland, rich skin	Erythematous plaques with dry or oily scales	 © Dr. P. Marazzi/Science Source
Psoriasis	Knees, elbows, buttocks	Chronic, well-demarcated, erythematous plaques with silver scale	 © Christine Langer-Pueschel/Shutterstock

Table 5-6 Papulosquamous Diseases (*continued*)

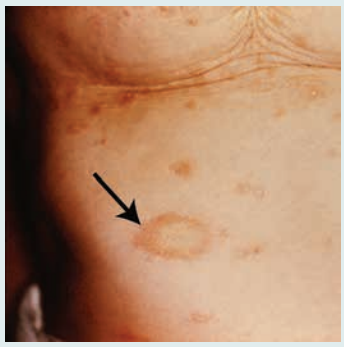
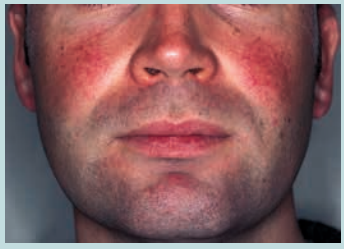
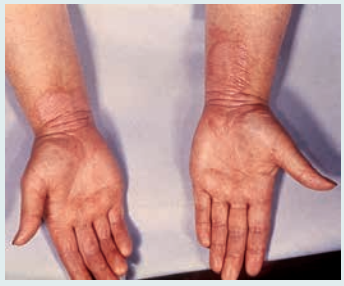
Diagnosis	Location of Lesions	Physical Examination Findings	Photograph
Pityriasis rosea	Following natural skin lines of trunk	Single 3- to 4-cm oval plaque at onset that is followed by numerous smaller (< 1 cm) plaques with collarette scale	 Courtesy of CDC
Rosacea	Face	Papules; pustules; no comedones	 © Hercules Robinson/Alamy
Lichen planus	Extremities	Pruritic, polyangular, planar, purple papules; lacy surface	 Courtesy of Susan Linsley/CDC

Table 5-7 Vesiculobullous Diseases

Diagnosis	Location of Lesions	Physical Examination Findings
Impetigo	Face, neck, extremities	Thin, erythematous bullous vesicles or pustules that heal with honey-colored crust
Herpes simplex (initial and recurrent)	Orolabial, genital	Expanding erosions with pain; an active vesicular border and scalloped periphery
Herpes zoster	Dermatomal distribution of thoracic, cranial, trigeminal, lumbar, and sacral nerves	Sequential pain; crops of erythematous papules and plaques followed by erosive blisters
Dyshidrosis	Symmetrically, palms, lateral fingers and toes, soles	Sudden eruption of highly pruritic vesicles that are deep-seated with clear fluid, followed by ring of scale and peeling
Erythema multiforme, minor	Extensor surfaces of extremities, oral mucosa	Successive crops of target lesions with well-defined borders and three zones of color
Erythema multiforme, major	Widespread trunk and mucosal involvement	Raised, flat, erythematous macules and papules; two-color zones with a poorly defined border; extensive eruption, epidermal detachment and systemic symptoms

Table 5-8 Dermatitis

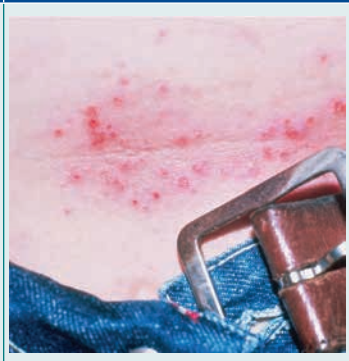
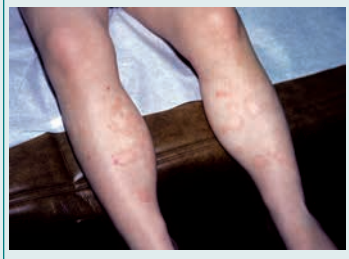
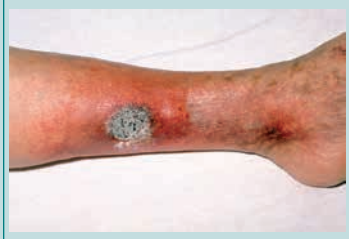
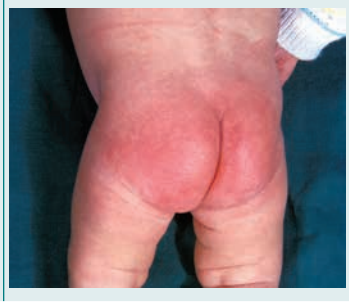
Diagnosis	Location of Lesions	Physical Examination Findings	Photograph
Allergic contact dermatitis	Exposure site; often hands, forearms, face, and tops of feet	Vesicles, edema, redness and extreme pruritus	 © Cavallini James/age fotostock
Atopic dermatitis	Flexural in children; extensor in adults	Abrupt onset; erythematous, oozing, vesicular acute rash with severe pruritus, redness, and scale	 © iStockphoto/Thinkstock
Nummular dermatitis	Extremities and trunk	Sharply demarcated, scaling, annular plaques with eczematous inflammation	 © Custom Medical Stock Photo/Alamy
Stasis dermatitis	Leg with varicosities and dilated veins and edema	Eczematous dermatitis with fissuring, chronic venous congestion, hyperpigmentation	 © Medical-on-Line/Alamy
Diaper area dermatitis	Infant buttock/genitalia, convex surfaces contacting diaper	Red base with satellite pustules; fringe of moist scale	 © Medical-on-Line/Alamy

Table 5-8 Dermatitis (*continued*)

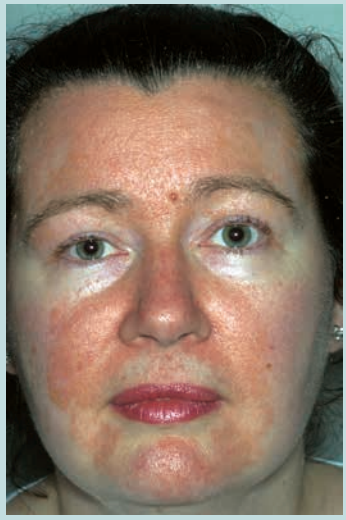
Diagnosis	Location of Lesions	Physical Examination Findings	Photograph
Seborrheic dermatitis	Scalp, brow, paranasal, postauricular, and flexural areas	Greasy, adherent scale on coalescing macules, papules, and patches	 © Hercules Robinson/Alamy

Table 5-9 Nodules

Diagnosis	Location of Lesions	Physical Examination Findings
Erythema nodosum	Extensor aspect of extremities	Often bilateral, poorly defined, red, nodule-like swelling over shins
Dermatofibroma	Legs	Solitary, dome-shaped, fixed, pink to brown; lateral pressure causes dimpling
Granuloma annulare	Lateral or dorsal surfaces of hands/feet	Asymptomatic, flesh-colored or red papules that progress to annular ring without scale
Cysts	Back, neck	Circumscribed lesion with wall and lumen that is filled with fluid or solid

Table 5-10 Inflammatory Disorders

Diagnosis	Location of Lesions	Physical Examination Findings
Acne	Face, neck, back, chest	Comedones and inflammatory papules, pustules, and nodules
Boil (furuncle)	Hair-bearing body part: head, neck, axilla, buttock	Red, hard, tender, then fluctuant
Hidradenitis	Axilla, inguinal, and perianal	Inflammatory subcutaneous nodules, perforate, drain, and form sinus with healing
Pyogenic granuloma	Head, lips, neck, hands	Friable vascular papule arising at site of previous trauma

Table 5-11 Hyperplasia

Diagnosis	Location of Lesions	Physical Examination Findings
Verruca	Hands, elbows, knees, feet	Epidermal proliferations, single, multiple, or confluent
Molluscum	Trunk, extremities, face	White, firm, flesh-colored, dome-shaped papule with central umbilication
Corn	Feet	Occurring over a bony prominence
Epidermal cyst	Head, neck, trunk	Dermal nodule with small overlying punctum
Xanthelasma	Eyelid skin	Yellow plaques
Skin tag	Neck and skin fold areas	Fleshy, compressible papules

Table 5-12 Benign Neoplasia

Diagnosis	Location of Lesions	Physical Examination Findings
Seborrheic keratosis	Anywhere	Variable color, waxy surface, stuck-on appearance
Mole	Anywhere; sun-exposed areas	Clusters of nevus cells arranged at various levels in the skin
Lipoma	Anywhere	Solitary, soft, well-defined tumor
Dermatofibroma	Legs	Solitary, dome-shaped, fixed, pink to brown lesions; lateral pressure causes dimpling
Keloid	Anterior chest, shoulders, neck	Large, raised scar that extends into adjacent normal skin
Hemangioma	Head and neck	Rapid growth, stabilization, and involution of red to purple vascular neoplasm
Neurofibroma	Follow course of peripheral nerves	Dermal and subcutaneous tumors increase with age

Table 5-13 Premalignant Disease

Diagnosis	Location of Lesions	Physical Examination Findings
Actinic keratosis	Head, neck, dorsal hands	Poorly defined hyperemia with adherent scale
Keratoacanthoma	Dorsal hands	Solitary, dull, red nodule with central keratotic plug
Dysplastic nevus	Anywhere; trunk and upper extremities	Multiple, atypical nevi with increased incidence of melanoma

Table 5-14 Malignant Disease

Diagnosis	Location of Lesions	Physical Examination Findings
Basal cell carcinoma	Face, scalp, ears, neck, sun-exposed areas of trunk, extremities	Pearly white, dome-shaped papule with ulcerative crusted, bleeding center
Squamous cell carcinoma	Head, neck, hands, sun-exposed areas of skin	Red, poorly defined base with raised, necrotic, crusted center
Melanoma	Back, chest, legs	Color and appearance vary considerably; pigmented and nonpigmented lesions
Paget's disease	Breast, extramammary	Red, sharply demarcated, irregularly outlined plaque or papule
Cutaneous T-cell lymphoma	Trunk, hip, buttocks, upper thigh, inner arms or legs	Red, scaly, eczematous or psoriasis-like eruption
Kaposi's sarcoma	Feet and lower legs	Raised, oval, poorly demarcated, rust or purplered patch, plaque, or nodule
Metastasis to the skin	Head, neck, chest, abdomen	Discrete, firm, painless nodule

Diagnostic Reasoning

Based on findings in the health history and physical examination, the clinician should formulate his or her assessment and plan. For example, a patient may report symptoms that suggest many possible diagnoses; however, findings in the past medical history and during the physical examination narrow the possible diagnoses down to one or two. Rash is a common chief complaint. **Table 15-15** illustrates differential diagnosis of common disorders associated with rash.

Diagnostic tests may help examiners with diagnosis. **Box 5-2** describes common laboratory and other tests used to diagnose disorders of the skin.

Table 5-15 Differential Diagnosis of Pruritic Rash

Differential Diagnosis	Significant Findings in the Patient's History	Significant Findings in the Patient's Physical Examination	Diagnostic Tests
Allergic or contact dermatitis	New onset, no known injury	Pruritic, papulovesicular rash confined to affected area of contact	Patch testing
Atopic dermatitis	History of childhood eczema, allergic rhinitis, family history of allergic rhinitis and eczema	Pruritic rash; erythematous, confluent papules and plaques affecting extensor areas; scarring	Biopsy, serum total IgE, KOH scraping
Arthropod bites	History of hypersensitivity reactions, outdoor exposure	Isolated, erythematous, pruritic papules and vesicles	None

Note: All scaling rashes should be scraped for potassium hydroxide (KOH) preparation to rule out fungus.

BOX 5-2 COMMON LABORATORY AND DIAGNOSTIC STUDIES USED TO DIAGNOSE SKIN DISORDERS

In the event that physical examination narrows the differential diagnosis but does not provide the final diagnosis, other diagnostic aids provide valuable information. In-office diagnostic testing includes skin surface microscopy, Wood's light exam, dermoscopy, cytologic smears, swab or tissue cultures, patch testing, and skin biopsy for histologic examination.

WOOD'S LIGHT EXAM

Description

Wood's light, or long ultraviolet (UV) light, is used mainly in the examination of epidermal pigmentary disorder and cutaneous infections. Applying long UV light to the skin in a dark room causes epidermal pigment to appear accentuated while dermal pigmentary disorders with normal epidermal findings are obscured. Depigmentation will similarly be exaggerated against normal skin, appearing chalky white.

Findings During the Wood's Light Exam

Fungal Diseases

- *Microsporum audouinii:* Bright blue-green
- *M. canis:* Bright blue-green
- *M. distortum:* Bright blue-green
- *Tinea tonsurans:* Nonfluorescent
- *T. versicolor:* Dull golden yellow

Bacterial Diseases

- Erythrasma: Brilliant coral, red-pink, orange
- *Pseudomonas aeruginosa:* Yellowish green

Pigmentary Disorders

- Epidermal: Accentuates pigment deposition
- Dermal: Unchanged pigment visibility
- Depigmentation: No pigment visible, white

SURFACE MICROSCOPY

Pigmented lesions may be better evaluated with in vivo skin surface microscopy. Surface microscopy or epiluminescence is an oil emersion technique; the epidermis is rendered translucent providing an enhanced exam with the aid of an illuminated 10× magnifier to evaluate the epidermal-dermal junction and melanocytic activity. Pigmented lesions should be evaluated utilizing the ABCDE mnemonic: examining for **A**symmetry, **B**order irregularity, **C**olor variegation, **D**iameter > 6 mm, and **E**levation or **E**nlargement. Following evaluation by the ABCDE mnemonic, histologic substrates are then examined for pattern analysis of the pigmented network. This process is complex and requires clinical experience and proficiency.

SCRAPING

For nonspecific fungal identification, scrapings taken from the skin or nails require scraping skin from the active border, using a #15 scalpel blade, placing onto a microscope slide, a cover slip, and applying 20% potassium hydroxide (KOH). Direct examination with the condenser on low light will aid in the identification of hyphae and spores.

Scraping for herpes virus infection via a Tzanck smear requires placing the scrapings of the base of a vesicle onto a slide and application of Giemsa or Wright's stain. Identification of multinucleated giant cells confirms the diagnosis. Because false negatives can occur, comparison with viral culture is suggested.

(continues)

BOX 5-2 COMMON LABORATORY AND DIAGNOSTIC STUDIES USED TO DIAGNOSE SKIN DISORDERS *(Continued)*

Scraping for mites at characteristic flexural sites of serpiginous burrows requires placing the scraping with mineral oil onto a glass slide to produce the female parasite, eggs, or mite fecal pellets (scybala).

CULTURES

Wounds or draining tissue can be cultured to identify the various potential microbial offenders. Correct organism identification is mandatory for complete treatment of an infected area. Bacterial, viral, and fungal cultures are collected and grown in appropriate media for the identification of specific organisms. Dermatophyte test medium (DTM) is a culture medium that will grow dermatophytes over 7 to 21 days.

PATCH TESTING

To diagnose allergic contact (not irritant) dermatitis, the patch test is the best way to expose the patient to the most common allergens in a prepared format. Patches containing the 20 most common allergens are applied, and then removed after 2 days. A papulovesicular eruption at the site of allergen exposure will prove positive reaction.

BIOPSY

Commonly, skin biopsy is required to accurately identify the pathology of a skin finding. The superficial or shave skin biopsy is indicated when pathologic diagnosis can be made from a small sample of tissue. Generally, perform shave biopsies for pedunculated, papular, or exophytic lesions. For evaluating inflammatory skin conditions potentially involving disease at depths from the epidermis down to the subcutaneous fat, perform a punch biopsy. This technique produces a cylinder of tissue varying in size from 2 mm to 10 mm, depending on the equipment used. Punch biopsies examine the depth of involvement and allow for special tissue staining. Excisional biopsy provides a deeper specimen when it is desirable to remove the entire lesion. This biopsy technique results in a larger defect and requires suturing for closure.

Skin Assessment of Special Populations

Considerations for the Pregnant Patient

- Note that the common dermatoses of pregnancy—pruritic urticarial papules of pregnancy (PUPP), intrahepatic cholestasis of pregnancy (ICP), and prurigo gravidarum— all include the common symptom of pruritus.
- Distinguish between herpes gestationis (HG) and PUPP. Herpes gestationis, more appropriately termed pemphigoid gestationis, is a pruritic condition of pregnancy that occurs with much less frequency (1:50:000) than PUPP. It should be distinguished from PUPP, as treatment commonly includes the use of oral corticosteroids. **Table 5-16** compares the clinical course and presentations of HG and PUPP.
- Recognize two other common pruritic conditions of pregnancy: prurigo gravidarum and ICP. Prurigo gravidarum (recurrent cholestasis of pregnancy) occurs late in pregnancy without any visible primary skin lesion. Signs of jaundice may develop, in addition to the generalized excoriations resulting from pruritus. An associated incidence of low birth weight and prematurity may occur. Recurrence may be seen in subsequent pregnancies. Symptoms resolve soon after delivery. ICP develops generally after 30 weeks and recurs in greater than 50% of subsequent pregnancies. The patient with ICP has a greater chance of developing cholelithiasis.

Table 5-16 Comparison of Herpes Gestationis (HG) and Pruritic Urticarial Papules of Pregnancy (PUPP)

Feature	HG	PUPP
Etiology	Autoimmune	Urticaria, reaction pattern
Incidence of occurrence	1:50,000	1:160–300; greater in primigrávidas
Symptom	Intense pruritus	Pruritus
Morphology	Tense vesicles and bullae	Coalescing papules
Regional involvement	Trunk, buttock, extremities	Abdominal, rarely umbilical
Onset	Anytime, usually 2nd trimester	Last trimester, commonly
Clinical course	Exacerbations and remissions	Fixed eruption, clear postpartum
Histopathology	Dermal eosinophils	Perivascular infiltrate
Postpartum prognosis	Recurs in subsequent pregnancy	Does not recur in subsequent pregnancy
Infant mortality	Some prematurity, small for age	No fetal effect

Considerations for the Neonatal Patient

- Recognize possible congenital patches of color and their significance.
- Note nevus flammeus (stork bite at back of the neck).
- Recognize Mongolian spots. These appear as areas of deep pigmentation in the sacral and gluteal regions of neonates with dark skin.

Considerations for the Pediatric Patient

General

- Note the following:
  - Pediatric patients present with an array of acute infections and infestations, as well as chronic dermatosis. The care of infections (bacterial, viral, and dermatophyte) is an important aspect of pediatric care.
  - Due to underdeveloped hygiene habits and multiple frequent contacts, the pediatric population harbors a plethora of organisms, which are readily identifiable and treatable.
- When taking the history remember the following:
  - Many families diagnose and treat children with readily available over-the-counter treatments prior to medical evaluation. When you are assessing the child with a skin condition, it is imperative that prior treatments be clearly identified.
  - Ask about all close personal contacts.

Common Skin Conditions/Diseases

- Bacterial infections: A superficial skin infection, impetigo (bullous and nonbullous), results from infection of primarily *Staphylococcus aureus,* and to a lesser extent, streptococci. Rarely, the organisms invade skin more deeply and cause erysipelas, cellulitis, and lymphangitis. In a superficial bacterial infection, the clinical course begins with an area of broken skin on the face or body, followed by localized vesiculobullous enlargement and rupture and ooze of serum from inflamed central bullae followed by the formation of a honey-colored crust. A mildly erythematous border may occasionally develop. Postinflammatory hyperpigmentation or hypopigmentation may follow the healed lesions. Careful history should be elicited regarding the duration of occurrence; for example, an increased incidence of nephritic involvement has been noted where streptococcus was responsible for a skin infection that has lasted longer than 1 week.
- Viral infections: Cutaneous viral infections are another frequent finding of the pediatric skin exam. Verruca vulgaris (common warts), verruca plantaris (plantar warts), and verruca plana (flat warts) are common visible manifestations of human papillomavirus, which can be seen in children and adolescents as firm hyperkeratotic papules and plaques of the epidermis. Molluscum contagiosum, a cutaneous viral infection caused by the poxvirus, also exhibits firm, raised, benign growths on the skin surface. **Table 5-17** distinguishes these common types of cutaneous viral illnesses and their clinical presentation. The varicella virus, commonly identified as chickenpox, is transmitted by the respiratory system. Varicella exhibits multiple teardrop-shaped vesicles on an erythematous base that develop 10 to 14 days after exposure.
- Superficial fungal infections: Superficial fungal infections exist in the uppermost, keratinized layer of skin. In childhood, superficial fungal infections frequently arise on the scalp, trunk, extremities, and feet. Generally, the fungi, belonging to several genera, create varying degrees of inflammatory response and exhibit a typically active scaly border. **Table 5-18** describes common superficial fungal infections of childhood with their usual presentations and causative organisms.
- Infestations: The pediatric population may exhibit the cutaneous manifestations of infestation. Mites *(Sarcoptes scabiei)* burrow in body folds, skin creases, and feet to produce

Table 5-17 Viral Skin Infections

Diagnosis	Virus Type	Location of Lesions	Physical Examination Findings	Arrangement	Hallmark Features
Molluscum	Poxvirus	Face, trunk, extremities	Dome-shaped, umbilicated papules, 1–5 mm	Single or grouped	Waxy appearance
Verruca vulgaris (common)	Human papillomavirus (HPV) 1, 2, 4, 7	Hands, extremities	Hyperkeratotic papules, may enlarge to plaques	Single or grouped	Black dots of thrombosed capillaries
Verruca plantaris (plantar)	HPV 1, 4, 63	Plantar surface of foot	Hyperkeratotic papules or plaques	Numerous small warts may fuse to mosaic surface	Lateral pressure causes pain
Verruca plana (flat)	HPV 1, 4, 63	Face, hands, legs	Flat-topped papules, 1–3 mm	Linear or grouped due to trauma of scratch/shave	Multiple, slightly elevated

a significant degree of pruritus. Another burrowing infestation, cutaneous larvae migrans (CLM), commonly known as creeping eruption, usually presents as burrows in the foot. Blood-sucking lice that inhabit the body *(Pediculus humanus)*, head *(Pediculus capitis)*, and genital regions *(Pediculus pubis)* puncture the skin and create irritation and pruritus with their saliva. Tick infestations, while a somewhat less common mite and more geographically predictable, can transmit the spirochete *Borrelia burgdorferi,* causing significant morbidity and potential mortality, and therefore should remain in the differential diagnosis of any insect bite or infestation. **Table 5-19** gives clinical features of infestations.

- Chronic relapsing conditions
  - *Atopic dermatitis:* Although the onset of atopic dermatitis (AD) occurs in the newborn period, it is regarded as a very common chronic disease (affecting approximately 10% of the pediatric population) and remains an underdiagnosed and often poorly managed disease. Often, the clinician is able to obtain an accurate history, identify typical skin findings, and secure the diagnosis of atopic dermatitis with very little challenge. In other cases, however, the dynamic process of acute, subacute, and chronic atopic dermatitis confuses the examination with multiple morphologies and the variations of age.
  - *Acne:* Acne is another multifactoral, challenging chronic disease of childhood and adolescence. Although not exclusive to adolescence, acne affects 85% of those aged between 12 and 24 years. Contributory factors include a hereditary predisposition, androgenic hormones, and inflammatory factors. **Table 5-20** presents acne subtypes. Two broad categories of acne exist: noninflammatory and inflammatory. Noninflammatory acne consists of the formation of open and closed comedones, frequently referred to as blackheads and whiteheads, respectively. Inflammatory lesions are characterized by morphologic description; acne lesions vary in size (papules less than 5-mm diameter, nodules greater than 5 mm) and may have purulent contents (pustules). Severity is graded as mild, moderate, or severe, as determined by the number of lesions present and the amount of inflammation. Assessment of the psychosocial impact of acne patients follows the physical assessment of the acne lesions. It is important to stress the goals of acne treatment, which are to control new acne and minimize scarring.
  - Similar-appearing lesions that are commonly mistaken for acne include perioral dermatitis, rosacea, hidradenitis suppurativa, and true keratinous cysts. Perioral dermatitis is an intolerance reaction; it often presents in young women as papules and pustules on the chin and nasolabial fold. Rosacea is of vascular origin. Patients with rosacea often have flushing, papules, pustules, telangiectasia, and tissue swelling. No comedones are present with rosacea. Hidradenitis, an epithelialization disorder, presents with communicating sinus tracts under inflammatory cysts.

Table 5-18 Superficial Fungal Infections

Diagnosis	Location of Lesions	Hallmark Features	Causative Organism	Clinical Subtypes
Tinea pedís	Soles, toe webs	Scale, inflammation, maceration	*Trichophyton rubrum* or *T. mentagrophytes*	Interdigital, moccasin, vesiculobullous
Tinea capitis	Hair shaft	Fine scale, kerion	*T. tonsurans* *T. schoenleinii*	Endothrix, ectothrix, favus
Tinea corporis	Non-hairy extremities, trunk	Arciform with advancing border	*T. rubrum* *T. mentagrophytes* *Microsporum canis*	Cranulomatous, verrucous, tinea incognito
Tinea versicolor (pityriasis versicolor)	Trunk, neck, arms, shoulders	Finely scaling, hypopigmented and hyperpigmented flat plaques	*Pityrosporum orbiculare*	
Cutaneous candidiasis	Diapered region	Bright erythema with satellite papules	*Candida albicans*	

Table 5-19 Infestations

Diagnosis	Method of Transmission	Incubation	Life Cycle	Symptoms	Clinical Highlight
Pediculosis	Shared clothing or bedding	30 days	25 days	Irritation, pruritus	It most commonly affects Caucasian children with straight hair.
Pubic louse	With or without person-to-person contact	Eggs are viable for 10 days	25 days, can live off host for 36 hours	Irritation, pruritus	There is a 95% chance of acquiring from an infected partner after one sexual exposure.
Ticks	From trees, grass, bushes, and animals; attach to human skin	Engorged after 7–14 days	Female feeds, engorges, and drops off after 1 to 2 weeks	Site marked by a round, crusted ulcer; bites often unrecognized	Rickettsial, viral, and spirochetal transmission is possible.
Scabies	Personal contact, clothing, linen, furniture	Usually 3–4 weeks; up to 8 weeks	Female can survive off human for 96 hours	Severe nighttime pruritus	It is highly communicable. There is cross antigenicity with house dust mites.

Table 5-20 Acne Subtypes

Acne Subtype	Inflammatory Features/Contributing Factors
Acne mechanica	Mechanical pressure over skin (i.e., chin straps, hats)
Steroid acne	Oral corticosteroids
Drug-induced acne	Anabolic steroids, antiepileptics, isoniazid
Acne neonatorum	Large sebaceous glands stimulated by maternal androgen
Acne excorié	Self-manipulation/excoriation
Acne cosmetica	Layers of cosmetics, aggressive cleansing with scrubs encourages inflammatory papules, masques

Considerations for the Geriatric Patient

General

- Note that an impaired epidermis, often seen in geriatric patients, is more susceptible to outside irritants.
- Remember visible skin signs of age can be attributed to intrinsic and extrinsic aging. Features of intrinsic and extrinsic aging may overlap but can usually be distinguished by inspection and palpation.
  - Inspect for signs of intrinsic aging. Intrinsic aging, or the changes due to normal maturity, include most noticeably a decreased number of sweat glands and hair follicles, decreased pigment of hair (thinning, graying hair), decreased dermal collagen and decreased number of dermal elastic fibers (fine wrinkling), thinning and ridging of nails, and loss or increase in subcutaneous fat deposition.
  - Inspect for signs of extrinsic aging (i.e., resulting from external insults), most significantly sunlight, but can occur secondary to ultraviolet light exposures in tanning booths and secondary to therapeutic ultraviolet light treatment. Environmental

pollution and smoking negatively impact cellular immunity and function also. In the epidermis, early changes of sun exposure take the form of freckling and solar lentigines. These changes demonstrate the effects of increased melanin production in an increased number of melanocytes. Epidermal thickening can be seen as early as the third decade of life (leathered appearance). Deeper papillary dermal effects of long-term sun exposure include wrinkled skin, telangiectasia, senile purpura, lentigo senilis, senile comedones, and skin cancers. Ultraviolet light exposure degrades dermal collagen, weakening the skin, resulting in atrophy and production of abnormal elastotic fibers. The examiner often finds that loss of dermal collagen surrounding blood vessels combined with minor trauma produces the common solar purpura. Sharply demarcated purpuric areas are commonly found on the arms. Telangiectasia, commonly seen on the facial skin and venous lakes of the lips, are isolated vascular formations found on sun-exposed areas where incidental sun exposure eventually affects perivascular collagen.

- Inflammatory skin conditions common to geriatric patients (including xerosis, dermatophytosis, stasis dermatitis, seborrheic dermatitis, and rosacea) can occur at any time in the life cycle but occur with increased frequency in this population.

Common Skin Conditions/Diseases

- Xerosis: Impaired keratinocyte formation, which results in abnormal epidermal cell turnover, is responsible for xerosis, the most common cause of itch in the elderly.
- Stasis dermatitis: Dry, itchy skin of the lower extremities warrants special evaluation for advancing vascular changes. Superficial varicose veins with the underlying vascular impediments of edema and pressure manifest as an eruption of the lower leg seen in stasis dermatitis. The inflamed, sometimes ulcerated skin of acute stasis dermatitis maybe accompanied by the chronic changes of stasis dermatitis including hyperpigmentation, lichenification, and scars of healed ulcers.
- Rosacea: While not limited to the geriatric population, rosacea is an underdiagnosed and misdiagnosed inflammatory condition, which is chronic and progressive. The hallmark of rosacea in the geriatric population is in the bulky tissue (phymatous) and dilated telangiectatic vessels commonly seen after years of persistent redness and flushing. Another common variant of rosacea in the elderly is ocular rosacea, often overlooked in the ocular examination.
- Skin tumors: Geriatric patients often seek evaluation because they have been "growing things," and should remain under a high index of suspicion for cutaneous malignancies as a result of cumulative ultraviolet exposure. Many skin tumors, however, are not malignancies. **Table 5-21** describes common geriatric benign tumors, with hallmark features that aid in their identification.

Table 5-21 Geriatric Benign Skin Tumors

Benign Epidermal Growth	Location of Tumors	Hallmark Features	Differential Diagnosis
Seborrheic keratosis	Face, trunk	Stuck-on appearance, varying color and degrees of dryness, waxy with pebbly or verrucous surface	Pigmented basal cell and squamous cell carcinomas, malignant melanoma, lentigo, wart, actinic keratosis
Cherry angioma (senile angioma)	Trunk	Smooth, firm, deep red, few or hundreds, increasing with age	Petechiae
Acrochordon (skin tag)	Neck, axillae, groin, eyelids	Soft compressible, pedunculated, or projectile	Seborrheic keratosis, dermal nevi, warts
Venous lake	Vermilion border of lip, ear	Compression collapses lesion	Blue nevus, malignant melanoma, tattoo
Sebaceous hyperplasia	Face—glabella	1- to 2-mm soft, dome-shaped, pale yellow with central umbilication	Basal cell carcinoma, HSV, molluscum
Chondrodermatitis nodularis chronica helicis	Lateral surface of the helix, antihelix	Single, firm, 2- to 6-mm painful, red to white nodule	Actinic keratosis, keratoacanthoma

Case Study Review

Throughout this chapter, you have been introduced to Mr. K. This section of the chapter pulls together his history and demonstrates the documentation of his history and physical examination.

Chief Complaint (Present Illness)

"I've got spots and I'm itching everywhere."

Information Gathered During the Interview

Mr. K is a 42-year-old man who presents with a 3-week history of erythematous papules and plaques of the lower anterior, medial, and lateral legs, which have developed slowly and persist. The condition worsened while using an over-the-counter neomycin antibiotic ointment. He has since discontinued use of the ointment and his legs have slightly improved. Mr. K has experienced recurrent similar episodes. He complains of moderate lower leg pruritus. Slight tenderness and straw-colored, odorless drainage gas developed over the past 5 days. The patient describes other scattered pruritic areas of arms and back as severe. He denies chemical exposure at work or in or outside his home. He has not traveled or been exposed to persons with a similar problem.

Mr. K has a 14-year history of generalized pruritus, often severe. He reports chronic, relapsing, localized, intensely pruritic lesions of the lower leg. He denies systemic diseases or change in appearance of hair or nails. Allergy patch testing was performed and, according to the patient, yielded no valuable results. The patient has tried multiple oral antihistamines; he currently takes none. The patient denies a history of childhood eczema, skin cancers, or precancers. He states that he had varicella as a child. Mr. K. reports he is mildly tolerant to sunlight. He denies previous surgeries or blood transfusions.

Mr. K has a family history of allergy, eczema, heart disease, and diabetes but no skin cancer. He is an only child; both parents are alive and well. His mother is sensitive to cosmetics and sunscreens and suffered from eczematous rashes in childhood. All family members have fair skin and blue eyes.

Mr. K does not smoke or drink. He is employed as a social worker. He lives in a single-family home with his wife and two children. Currently, 10 puppies, 1 dog, and 1 cat reside in the patient's home. He denies outdoor vocations or avocations. He had remote exposure to Agent Orange in Vietnam.

Clues	Important Points
Atrophic patches with loss of surface characteristics	Scar formation is the visible and tactile result of healed repeated injury.
Hyperpigmentation	Indicative of postinflammatory pigmentary alteration.
Erythematous, raised, poorly defined papules	Inflammatory reaction induces localized edema and erythema without margination.
Erosions	Initial scratching excoriates epidermis with central superficial tissue loss. Repeated trauma such as scratching or rubbing results in tissue thickening or *lichenification.* Often occurs at sites of easy access such as arms, legs, and upper back.
Dry, cracked skin of lower extremities	Dry skin, commonly found where sebaceous activity is minimal, is the frequent cause of pruritus. Interrupted/excoriated skin is easily attacked by allergens and infectious organisms.
Scattered, isolated pustules surrounded by erythematous halo	Pustules indicate bacterial process with inflammation at site of friction.

Name LK	Date 2-1-16	Time 1000
	DOB 7-12-74	Sex M
HISTORY		
CC "I've got spots and I'm itching everywhere."		
HPI 3-week history of pruritic erythematosus papules, plaques of lower legs; now tender with straw-colored drainage; worsened with neomycin topical antibiotic		

Medications None. Previously ordered nasal steroids and oral antihistamines; self-discontinued
Allergies Peanuts, sulfa drugs, seasonal environmental allergies
PMI 14-year history of dry, sensitive skin with generalized pruritus, with chronic, relapsing, localized intensely pruritic areas of the lower leg in the last year.
Illnesses Childhood varicella; patient experiences recurring pruritic areas.
Hospitalizations/Surgeries None
FH Unknown family history of asthma. Mother has been sensitive to cosmetics and sunscreens and had eczematous rashes in childhood. FH includes allergy, eczema, heart disease, and diabetes. Denies FH of skin cancer.
SH Lives with wife, 2 children, 1 dog, 10 puppies, 1 cat. Works as social worker. Denies outdoor hobbies.

ROS

General Denies recent constitutional changes.	Cardiovascular Unremarkable.
Skin Relapsing episodes of inflamed, pruritic papules, plaques of lower extremities.	Respiratory No asthma. Positive for environmental allergies.
Eyes No deficits, no correction.	Gastrointestinal Denies nausea and vomiting.
Ears No deficits.	Genitourinary/Gynecological Denies presence of rash or recent changes.
Nose/Mouth/Throat Dentition intact.	Musculoskeletal Osteoarthritis of knees.
Breast Negative.	Neurological Denies changes in mental status.

PHYSICAL EXAMINATION

Weight 158 lb	Temp 98	BP 132/70
Height 5'9"	Pulse 82	Resp 20

General Appearance Alert, well-developed, normal habitus. In no acute distress
Skin Multiple moderately erythematosus, isolated and confluent papules and plaques, loosely arranged, with central erosions on xerotic skin of lower extremities. No warmth; minimal drainage; some crust and slight tenderness at singular area. Multiple lichenified, hyperpigmented and atrophic patches scattered over lower extremities.
HEENT Normocephalic. Increased ocular lacrimation. Slight, clear nasal drainage
Cardiovascular RRR, normotensive
Respiratory No wheeze or cough
Gastrointestinal Deferred
Genitourinary Deferred

Musculoskeletal *Stable gait*
Neurological *Grossly intact*
Other
Lab Tests *KOH of scaly plaque*
Special Tests *Consider culture and/or tissue biopsy if not responsive to treatment.*
Final Assessment Findings 1. *Atopic dermatitis with impetiginization* 2. *Possible allergy or sensitivity to topical neomycin*

Bibliography

American Academy of Family Physicians (AAFP). (1999). AAFP core educational guidelines: Conditions of the skin. *American Family Physician, 60*(4), 1258–1264.

Arndt, K. A. (1997). *Primary care dermatology.* Philadelphia, PA: W. B. Saunders.

Boguniewicz, M. (2002, September). Introduction to immunology (the A's, B's, and T's). *Adapt: Evolving strategies for the management of atopic dermatitis,* 1–24.

Burkhart, C. G. (2001, July/August). Case 4: Oh boy! *Clinical Advisor*, 76–86.

Callen, J. P., Greer. E., Paller, A. S., Swinyer, L. J. (2000). *Color atlas of dermatology* (2nd ed.). Philadelphia, PA: W. B. Saunders.

Grin, C. M. (2001). Can you identify these disorders in black skin. *Consultant, 41*(4), 550–562.

Habif, T. (2015). *Clinical dermatology: A color guide to diagnosis and therapy* (6th ed.). Edinburgh, UK: Saunders/Elsevier.

Porth, C. M. (2013). *Pathophysiology: Concepts of altered health states* (9th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Additional Resource

The Skin Cancer Foundation

http://www.skincancer.org

This site provides extensive information about detection, prevention, and treatment of skin cancer.