Disorders and Diseases of the Scalp

5 CE Hours

By: Staff Writer

Learning objectives

- Describe the anatomy of the skin.
- List the layers of the skin and their functions.
- Describe the glands of the skin.
- Define the classifications of bacteria.
- Describe the lesions you might encounter when serving a client.
- List disorders of the sebaceous glands.
- Describe the kinds of acne that people may have.
- Describe the kinds of dandruff you might see on a client’s scalp.
- List the symptoms and signs of contact dermatitis and skin allergies.
- List common diseases of the scalp.
- Describe the steps you must take to prevent transmission of disease at your salon.
- Describe universal precautions.
- Describe the structure of hair.
- Describe the chemical composition of hair.
- Describe the growth cycles of hair.
- List the evaluations to consider when you analyze hair and scalps.
- List the types of baldness clients may experience.
- Name the products approved for treatment of hair loss.

Topics to be covered in this course

- Inflammation.
- Histology of the skin.
- Bacteria and viruses.
- Disorders of the skin.
- Disorders of the scalp.
- Diseases of the scalp.
- Principles of prevention.
- Chemical composition of the hair.
- Hair loss.

Introduction

From the simplest to most complicated, the licensed, practicing cosmetologist and licensed, practicing barber must deal with scalp disorders and be able to recognize when to refer clients to a medical professional for a scalp disease. The importance is simply a matter of public health. Both of these professions must practice sanitation and disinfection in serving the clients. This is particularly important in the cases of contagious and communicable diseases.

The desire to have healthy, attractive hair can be undercut if a skin disorder produces a debilitated condition of the scalp. Diseases and disorders of the scalp can cause scalp conditions that include excessive oiliness, excessive flaking, inflammation, patchy scabbing and intense pruritus (itching).

Some of these disorders are infections; some are allergic reactions or other immune responses, and involve some degree of inflammation.

What is inflammation? Some are conditions confined to the scalp (e.g., tinea capitis, also called ringworm), and some are scalp manifestations of a more general or systemic condition (e.g., psoriasis).

Each condition has specific symptoms, but the presentation of symptoms may be confusingly similar between one condition and another (for example, seborrheic dermatitis of the scalp and psoriasis of the scalp have a number of symptoms and clinical features in common). Some conditions, or milder forms of conditions, can be managed by the professional or even home care with over-the-counter medications. More severe symptoms and systemic conditions such as psoriasis should be treated by a dermatologist or other physician with the knowledge and experience in treating skin diseases.

Inflammation is one of the body’s principal defense systems against invasion by microorganisms or injury by thermal, chemical or physical trauma. The successful endpoint of inflammation is healing; a simple example is the inflammatory response to a splinter in the finger, resulting in expulsion of the splinter and healing the wound.

Inflammation is orchestrated by the body’s immune system. When immune surveillance detects an event it interprets as invasion or injury, a cascade of inflammatory precursors is set into motion. When the reason for the inflammatory response is resolved, the inflammatory response is concluded under control of the immune system.

The inflammatory response can go awry, however, to the point that inflammation becomes a disease in itself. For example:

- Inflammatory response to a local bacterial infection spirals out of control, becoming a body-wide inflammation of all major organs that ends in critical illness or even death (sepsis).
- Inflammation in response to local insult proceeds to a persistent, chronic inflammatory state that may be associated with arthritis, heart disease, complications of psoriasis and a number of other chronic conditions.

How and why regulation of the inflammatory response sometimes fails is a subject of intense medical investigation.

HISTOLOGY OF THE SKIN

To bring an understanding of scalp problems, we must first cover the anatomy of the skin. The skin is the largest and one of the most important organs of the body. Healthy skin is slightly moist, soft and flexible with a texture (feel and appearance) that ideally is smooth and fine grained. Healthy skin possesses a slightly acid reaction (the acid mantle) with good immunity responses to organisms that touch or try to enter it. Appendages of the skin include hair, nails, and sweat and oil glands.

Skin varies in thickness. It is thinnest on the eyelids and thickest on the palms of the hands and the soles of the feet. Continued pressure on
any part of the skin can cause it to thicken and develop into a callus. The skin of the scalp is constructed similarly to the skin elsewhere on the human body, but the scalp has larger and deeper hair follicles to accommodate the longer hair of the head. Here, it is of value to mention that the number of follicles and their size and shape are in existence from 4 months pre-natal. The number of follicles provides the density of hair from thin to thick. The size of the follicle will determine the diameter of the hair strands (i.e., fine or coarse). The follicle shape will dictate the wave pattern.

Think of the follicle shape as the opening of a cookie press. Hair actually starts out as a semi-liquid. As the cells reproduce, the hair is formed and hardened as it is pushed through the epidermis to the outside. If the follicle shape is round, the hair will have a straight wave pattern. Because of resistance, hair that is formed through an oval or even a slit follicle will produced wavy to very curly hair. Of course, all of this has a direct link to an individual’s genetic background.

The skin is composed of two main divisions: the epidermis (outer layer) and the dermis (true skin).

The epidermis is the outermost layer of the skin. This layer is also called the cuticle or scarf skin. It is the thinnest layer of the skin and forms a protective covering for the body. It contains no blood vessels but has many small nerve endings. The epidermis is made up of the following layers:

- The stratum corneum, or horny layer, is the outer layer of the epidermis. Its scalelike cells are continually being shed and replaced by cells coming to the surface from underneath. These cells are made up of keratin, a fiber protein that is also the principal component of hair and nails. The cells combine with a thin layer of oil to help make the stratum corneum a protective, waterproof layer.
- The stratum lucidum is the clear, transparent layer under the stratum corneum; it consists of small cells through which light can pass.
- The stratum granulosum, or granular layer, consists of cells that look like distinct granules. These cells are almost dead and are pushed to the surface to replace cells that are shed from the stratum corneum.
- The stratum germinativum, formerly known as the stratum mucosum and also referred to as the basal or Malpighian layer, is the deepest layer of the epidermis. It is composed of several layers of different-shaped cells. The deepest layer is responsible for the growth of the epidermis. It also contains a dark skin pigment, called melanin, which protects the sensitive cells below from the destructive effects of excessive ultraviolet rays of the sun or those from an ultraviolet lamp. These special cells are called melanocytes. They produce melanin, which determines skin color.

The dermis is the underlying or inner layer of the skin. It is also called the derma, corium, cutis or true skin. This highly sensitive layer of connective tissue is about 25 times thicker than the epidermis. Within its structure, there are numerous blood vessels, lymph vessels, nerves, sweat glands, oil glands and hair follicles, as well as arrector pili muscles (small muscles that work in connection with the hair follicles) and papillae (small cone-shaped projections of elastic tissue that point upward into the epidermis). The dermis is made up of two layers: the papillary or superficial layer, and the reticular or deeper layer.

- The papillary layer is the outer layer of the dermis, directly beneath the epidermis. Here you will find the dermal papillae, which are small, cone-shaped elevations at the bottom of the hair follicles. Some papillae contain looped capillaries and others contain small structures called tactile corpuscles, with nerve endings that are sensitive to touch and pressure. This layer also contains some melanin.
- The reticular layer is the deeper layer of the dermis that supplies the skin with oxygen and nutrients. It contains the following structures within its network:
  - Fat cells.
  - Blood vessels.
  - Lymph vessels.
  - Oil glands.
  - Sweat glands.
  - Hair follicles.
  - Arrector pili muscles.

Subcutaneous tissue is a fatty layer found below the dermis that some specialists regard as a continuation of the dermis. This is also called adipose or subcutis tissue and varies in thickness according to the age, sex, and general health of the individual. It gives smoothness and contour to the body, contains fats for use as energy, and also acts as a protective cushion for the outer skin.

How the skin is nourished

Blood and lymph, the clear fluids of the body that resemble blood plasma but contain only colorless corpuscles, supply nourishment to the skin. As they circulate through the skin, the blood and lymph contribute essential materials for growth, nourishment and repair of the skin, hair and nails. Networks of arteries and lymph vessels in the subcutaneous tissue send their smaller branches to hair papillae, hair follicles and skin glands.

Nerves of the skin

The skin contains the surface endings of the following nerve fibers:

- Motor nerve fibers, which are distributed to the arrector pili muscles attached to the hair follicles. These muscles can cause goose bumps when a person is frightened or cold.
- Sensory nerve fibers, which react to heat, cold, touch, pressure and pain. These sensory receptors send messages to the brain.

Glands of the skin

The skin contains two types of duct glands that extract materials from the blood to form new substances: the sudoriferous glands or sweat glands, and the sebaceous glands or oil glands.

- Sudoriferous (sweat) glands
  The sudoriferous or sweat glands, which excrete sweat from the skin, consist of a coiled base, or fundus, and a tube-like duct that ends at the skin surface to form a sweat pore. Practically all parts of the body are supplied with sweat glands, which are more numerous on the palms, soles, forehead and in the armpits. The sweat glands regulate body temperature and help to eliminate waste products from the body. Their activity is greatly increased by heat, exercise, emotions, and certain drugs.

  The excretion of sweat is controlled by the nervous system. Normally, one to two pints of liquids containing salts are eliminated daily through sweat pores in the skin.
Functions of the skin

The principle functions of the skin are protection, sensation, heat regulation, excretion, secretion, and absorption.

**Protection.** The skin protects the body from injury and bacterial invasion. The outermost layer of the epidermis is covered with a thin layer of sebum, which renders it waterproof. This outermost layer is resistant to wide variations in temperature, minor injuries, chemically active substances, and many forms of bacteria.

**Sensation.** By stimulating sensory nerve endings, the skin responds to heat, cold, touch, pressure and pain. When the nerve endings are stimulated, a message is sent to the brain. You respond by saying “ouch” if you feel pain, by scratching an itch, or by pulling away when you touch something hot. Sensory nerve endings are located near the hair follicles.

**Heat regulation.** This means that the skin protects the body from the environment. A healthy body maintains a constant internal temperature of about 98.6 degrees Fahrenheit (37 degrees Celsius). As changes occur in the outside temperature, the blood and sweat glands of the skin make necessary adjustments to allow the body to be cooled by the evaporation of sweat.

**Excretion.** Perspiration from the sweat glands is excreted through the skin. Water lost through perspiration takes salt and other chemicals with it.

**Secretion.** Sebum, or oil, is secreted by the sebaceous glands. This oil lubricates the skin, keeping it soft and pliable. Oil also keeps hair soft. Emotional stress can increase the flow of sebum.

**Absorption.** Absorption is limited, but it does occur. When used as an ingredient of a face cream, female hormones can enter the body through the skin and influence it to a minor degree. Fatty materials, such as lanolin creams, are absorbed largely through hair follicles and sebaceous gland openings.

Control and care of the skin

Though the health of the skin is primarily under internal control, we do have direct access to its entire surface. This means we can do more to maintain it in good health than we can with most of our internal organs. But the skin is a very sensitive organ, and if exposed to harsh cleaners or strong chemicals, will soon show widespread damaging effects.

The sensible use of mild soap and warm water together with various cosmetics can do wonders in improving the skin. Cleansing and nourishing creams, lotions, skin conditioners and face powders have both a psychological and practical value in maintaining both its appearance and health.

The skin is normally protected by its character and natural oil (sebum). Dry skin is caused by a lack of this oil or by too little water being found in the skin. If your skin is dry, you should be careful not to use strong detergents or soaps, especially in the winter. Skin creams are helpful in correcting the low level of oils on the surface of the skin.

On the other hand, oily or greasy skin is often a problem in the teens. More frequent washing and avoiding oily lotions or cosmetics may improve the condition. Careful control of the diet, avoiding sweet and oily foods, may often help clear up or improve the condition. The scalp, too, needs frequent shampooing, as an oily skin usually means an oily scalp.

But persons with an oily skin have compensation. Their difficulties are over by the time they reach their late 20s. The activity of the sebaceous glands then returns to normal.

As a person gets older, still other complications of the skin may arise. Causes of wrinkling and aging of the skin are not yet wholly understood even by expert dermatologists. These effects are connected with hormone changes and a breakdown of fat cells and the elastic tissue of the skin. New hormone creams, constantly being introduced, may be helpful in improving a dry or wrinkling skin.

The rays of the sun also cause wrinkling of the skin. A heavy skin tan accelerates skin breakdown. Suntan lotion can screen out harmful rays and will help to prevent this damage. The skin around the eyes is the first to show wear. To avoid unnecessary squinting in strong glaring sunlight, it is wise to wear sunglasses.

To prevent stretching the skin unduly, it is better to maintain a constant average weight. Excessive gain and loss in weight may create flabby skin around the neck and face.

It is fairly safe to say that what is best for your general health, happiness and appearance is also best for your skin. Great care must be exercised to maintain the health and appearance of this very vital organ.

Bacteria

**Bacteria** are one-celled microorganisms with both plant and animal characteristics. Also known as germs or microbes, bacteria can exist almost anywhere: on the skin, in water, air, decayed matter, secretions of body openings, on clothing, and beneath the nails.

Bacteria can only be seen with the aid of a microscope; 1,500 rod-shaped bacteria will fit comfortably on the head of a pin.

Types of bacteria

There are hundreds of different kinds of bacteria. However, bacteria are classified into two main types, depending on whether they are beneficial or harmful.

Most bacteria are nonpathogenic organisms (helpful or harmless; not disease-producing), which perform many useful functions, such as decomposing garbage and improving soil fertility. In the human body, nonpathogenic bacteria help metabolize food, protect against infectious microorganisms and stimulate immune response.

Some bacteria cultures are used to produce penicillin, acidophilus yogurt, and a special type of milk used for gastrointestinal disorders. Saprophites, a type of nonpathogenic bacteria, lives on dead matter.

Pathogenic bacteria are harmful and, although in the minority, cause disease when they invade plant or animal tissue. To this group belong the parasites, which require living matter for their growth.

- **Sebaceous (oil) glands**
  The sebaceous or oil glands of the skin are connected to the hair follicles. They consist of little sacs with ducts that open into the follicles. They secrete sebum, a fatty or oily secretion that lubricates the skin and preserves the softness of the hair. With the exception of the palms of the hands and the soles of the feet, these glands are found in all parts of the body, particularly in the face and scalp, where they are larger.

  Ordinarily, sebum flows through the oil ducts leading to the mouths of the hair follicles. However, when the sebum hardens and the duct becomes clogged, a blackhead is formed.
Classifications of pathogenic bacteria

Bacteria have distinct shapes that help to identify them. Pathogenic bacteria are classified as follows.

- **Cocci** are round-shaped bacteria that appear singly (alone) or in the following groups:
  - **Staphylococci** – Pus-forming bacteria that grow in clusters like a bunch of grapes. They cause abscesses, pustules, and boils.
  - **Streptococci** – Pus-forming bacteria arranged in curved lines resembling a string of pearls. They cause infections such as strep throat and blood poisoning.

- **Bacilli** are short, rod-shaped bacteria. They are the most common bacteria, and produce diseases such as tetanus (lockjaw).

- **Spirilla** are spiral or corkscrew-shaped bacteria. They are subdivided into subgroups, such as *Treponema pallidum*, which causes syphilis, and *Borrelia burgdorferi*, which causes Lyme disease.

Movement of bacteria

Different bacteria move in different ways. Cocci rarely show active mobility (self-movement). They are transmitted in the air, dust, or within the substance in which they settle. Bacilli and spirilla are both mobile and use slender, hairlike extensions, known as flagella or cilia, for locomotion. A whiplike motion of these hairs moves the bacteria in liquid.

Bacterial growth and reproduction

Bacteria generally consist of an outer cell wall and internal protoplasm. They manufacture their own food from the surrounding environment, give off waste products, and grow and reproduce. The life cycle of bacteria is made up of two distinct phases: the active or vegetative stage, and the inactive or spore-forming stage.

- **Active or vegetative stage:**
  - During the active stage, bacteria grow and reproduce. These microorganisms multiply best in warm, dark, damp, or dirty places where sufficient food is available. When conditions are favorable, bacteria grow and reproduce. When they reach their largest size, they divide into two new cells. This division is called mitosis. The cells that are formed are called daughter cells. When conditions are unfavorable, bacteria die or become inactive.

- **Inactive or spore-forming stage:**
  - Certain bacteria, such as the anthrax and tetanus bacilli, form spherical spores with tough outer coverings during their inactive stage. The purpose is to be able to withstand periods of famine, dryness and unsuitable temperatures. In this stage, spores can be blown about and are not harmed by disinfectants, heat or cold.
  - When favorable conditions are restored, the spores change into the active or vegetative form, then grow and reproduce.

Viruses

A virus is a submicroscopic structure capable of infecting almost all plants and animals, including bacteria. They are so small that they can even pass through the pores of a porcelain filter. They cause common colds and other respiratory and gastrointestinal infections. Other viruses that plague humans are measles, mumps, chicken pox, smallpox, rabies, yellow fever, hepatitis, polio, influenza and HIV, which causes AIDS.

One difference between viruses and bacteria is that a virus lives only by penetrating cells and becoming part of them, while bacteria are organisms that can live on their own. It is for this reason that bacterial infections can usually be treated with specific antibiotics while viruses are hard to kill without harming the body in the process. Generally, viruses are resistant to antibiotics. Vaccination prevents viruses from penetrating cells, but vaccinations are not available for all viruses.

DISORDERS OF THE SKIN

Like any other organ of the body, the skin is susceptible to a variety of diseases, disorders and ailments. In your work as a cosmetologist/barber, you will often see skin and scalp disorders, so you must be prepared to recognize certain common skin conditions and know what you can and cannot do with them. Some skin and scalp disorders can be treated in cooperation with and under the supervision of a physician. Medicinal preparations, available only by prescription, must be applied in accordance with the physician’s directions. If a client has a skin condition that you do not recognize as a simple disorder, refer the client to a physician.

It is very important that a beauty/barber salon does not serve a client who is suffering from an inflamed skin disorder, infectious or not. The cosmetologist/barber should be able to recognize these conditions and sensitively suggest that proper measures be taken to prevent more serious consequences. Thus, the health of the cosmetologist/barber as well as the health of other clients is safeguarded.

Listed below are a number of important terms relating to skin, scalp, and hair disorders that you should be familiar with.

Lesions of the skin

A lesion is an injury or damage that changes the structure of tissues or organs. There are three types of lesions: primary, secondary and tertiary. The cosmetologist/barber is concerned with primary and secondary lesions only. If you are familiar with the principal skin lesions, you will be able to distinguish between conditions that may or may not be treated in a beauty/barber salon.

- **Primary lesions:**
  - **Bulla:** A large blister containing a watery fluid; similar to a vesicle but larger.
  - **Cyst:** A closed, abnormally developed sac, containing fluid, semifluid or morbid matter, above or below the skin.

- **Secondary lesions:**
  - **Macule:** A spot or discoloration on the skin, such as a freckle. Macules are neither raised nor sunken.
  - **Papule:** A pimple; small, circumscribed elevation on the skin that contains no fluid but may develop pus.
  - **Pustule:** An inflamed pimple containing pus.
  - **Tubercle:** An abnormal rounded, solid lump above, within or under the skin; larger than a papule.
  - **Tumor:** A swelling; an abnormal cell mass resulting from excessive multiplication of cells, varying in size, shape and color. Nodules are also referred to as tumors but are smaller.
  - **Vesicle:** A small blister or sac containing clear fluid, lying within or just beneath the epidermis. Poison ivy and poison oak, for example, produce vesicles.
Acne vulgaris

Acne vulgaris is diagnosed but when the inflamed area becomes infected, the more serious acne bacteria enter the inflamed area and can spread to surrounding areas. Acne occurs most frequently on the face, back, and chest, but any area of skin can be affected. It occurs most frequently with fine-textured, dry types of skin. Acne is characterized by chronic inflammation of the sebaceous glands from retained secretions. It occurs most frequently on the face, neck, back, chest, and shoulders. Milia are associated with fine-textured, dry types of skin.

Disorders of the sebaceous (oil) glands

There are several common disorders of the sebaceous (oil) glands that the cosmetologist/barber should be able to understand and identify. A comedone, or blackhead, is a wormlike mass of hardened sebum in a hair follicle. Comedones appear most frequently on the face, especially on the forehead and nose, but can also migrate to the scalp, behind the ears and neck. When the hair follicle is filled with an excess of oil from the sebaceous gland, a blackhead forms and creates a blockage at the mouth of the follicle. Blackheads should be removed under sterile conditions using proper extraction procedures. Should the condition become severe, medical attention is necessary.

Milia, also called whiteheads, are small, whitish, pearl-like masses of the epidermis, caused by retention of sebum. They can occur on any part of the face, neck, back, chest, and shoulders. Milia are associated with fine-textured, dry types of skin.

Acne is a skin disorder characterized by chronic inflammation of the sebaceous glands from retained secretions. It occurs most frequently on the face, back, and chest, but any area of skin can be affected. Bacteria enter the inflamed area and can spread to surrounding areas. Acne, or common pimples, is also known as acne simplex or acne vulgaris.

There are two basic types of acne: simple acne and the more serious acne vulgaris. Everyone has had the occasional pimple or blackhead, but when the inflamed area becomes infected, the more serious acne vulgaris is diagnosed.

- **Acne vulgaris** is polymorphic (able to take on other characteristics). Open and closed comedones, papules, pustules, and cysts are found.*
- **Acne vulgaris** is more common and more severe in males. It does not always clear spontaneously when maturity is reached. Twelve percent of women and 3 percent of men over the age of 25 have acne vulgaris. This rate does not decrease until after the age of 44. The skin lesions parallel sebaceous activity. Pathogenic events include plugging of the opening of the follicles, retention of sebum, overgrowth of acne bacillus with resultant release of and irritation by fatty acids, and foreign body reaction to extrafollicular sebum. The mechanism of antibiotics in controlling acne is not clearly understood, but they may work because of their antibacterial or anti-inflammatory properties.

Disorders of the sudoriferous (sweat) glands

- **Anhidrosis** – Deficiency in perspiration, often a result of fever or certain skin diseases. It requires medical treatment.
- **Bromhidrosis** – Foul-smelling perspiration, usually noticeable in the armpits or on the feet.
- **Hyperhidrosis** – Excessive sweating, caused by heat or general body weakness. Medical treatment is required.

- **Fissure** – A crack in the skin that penetrates the dermis. For example, chapped hands or lips.
- **Keloid** – A thick scar resulting from excessive growth of fibrous tissue.
- **Scale** – Any thin plate of epidermal flakes, dry or oily. An example is abnormal or excessive dandruff.
- **Scar or cicatrix** – Light-colored, slightly raised mark on the skin formed after an injury or lesion of the skin has healed.
- **Ulcer** – An open lesion on the skin or mucous membrane of the body, accompanied by pus and loss of skin depth.

There may be mild soreness, pain, or itching. The lesions occur mainly over the face, neck, upper chest, back and shoulders. Comedones are the hallmark of acne vulgaris. Closed comedones are tiny, flesh-colored, noninflamed bumps that give the skin a rough texture or appearance. Open comedones typically are a bit larger and have black material in them. Inflammatory papules, pustules, ectasic pores, acne cysts and scarring are also seen.

Acne may have different presentations at different ages. Preteens often present with comedones as their first lesions. Inflammatory lesions in young teenagers are often found in the middle of the face, extending outward as the patient becomes older. Women in their third and fourth decades (often with no prior history of acne) commonly present with popular lesions on the chin and around the mouth.

Rosacea, formerly called acne rosacea, is a chronic congestion appearing primarily on the cheeks and nose, characterized by redness, dilation of blood vessels, and the formation of papules and pustules. The cause of rosacea is unknown, but certain factors are known to aggravate the condition in some individuals. These include spicy foods, caffeine, alcohol, exposure to extremes of heat and cold or sunlight, and stress.*

*A hard and fast rule of care is the unbroken skin is the body’s first line of defense against infection. The professional should be mindful of this rule and refer the client to a physician for diagnosis and treatment.

Services that require work on inflamed skin can and will exacerbate a condition. Bacteria and viruses on the skin can and do migrate to other areas. It bears repeating that sanitation and sterilization practices are paramount in the service to the public. Beware if inflammation or broken skin is present.

Seborrhea is a skin condition caused by an abnormal increase of secretion from the sebaceous glands. An oily or shiny condition indicates the presence of seborrhea.

Asteatosis is a condition of dry, scaly skin due to a deficiency or absence of sebum, caused by old age and by exposure to cold.

A steatoma is a sebaceous cyst or fatty tumor. It is filled with sebum and ranges in size from a pea to an orange. It usually appears on the scalp, neck and back. A steatoma is sometimes called a wen.
Inflammations of the skin

**Dermatitis** – Inflammatory condition of the skin. The lesions come in various forms, such as vesicles or papules.

**Eczema** – An inflammatory, painful itching disease of the skin; acute or chronic in nature, presenting many forms of dry or moist lesions. All cases of eczema should be referred to a physician for treatment. Its cause is unknown.

**Herpes simplex** – Fever blister or cold sore; recurring viral infection. It is characterized by the eruption of a single vesicle or group of vesicles on a red swollen base. The blisters usually appear on the lips, nostrils, or other part of the face, and rarely last more than a week. It is contagious.

**Psoriasis** – A skin disease characterized by red patches, covered with white-silver scales usually found on the scalp, elbows, knees, chest, and lower back. It rarely occurs on the face. If irritated, bleeding points occur. It is not contagious.

**DISORDERS OF THE SCALP**

Just as the skin on other parts of the body is continually being shed and replaced, the uppermost layer of the scalp is also being cast off and replaced. The skin is in a constant state of renewal. Skin cells in the outer layer of the scalp flake off and are replaced by new cells below. Ordinarily, these horny scales loosen and fall off freely. The natural shedding of the scalp’s dead scales should not be mistaken for dandruff.

**Seborrhea of the scalp**

Sebum is the oily substance secreted by the sebaceous glands in the skin. This “skin oil” has a protective function of keeping skin from losing moisture and becoming excessively dry, and providing a layer of defense against potentially infectious microorganisms. Seborrhea is the medical term for excessive production of sebum, but the definition of “excessive” varies with the age and gender of the individual. Sebum production is influenced by age, sex, and hormonal status.

Because the largest sebaceous glands are on the face, scalp and groin, these areas are subject to become excessively oily due to seborrhea. All sebaceous glands distribute sebum through a connection to the hair follicles, making sebaceous glands and hair follicles the functional units for dispensing sebum to the surface of the skin. The anatomical proximity of sebaceous glands and hair follicles explains why oily skin and oily hair occur together in seborrhea.

Sebum production is largely under hormonal control, with the androgenic male hormones playing a central role in both males and females. As males begin to mature into adulthood at about age 13 to 16, androgen levels rise and sebum production increases. Sebum production reaches its highest level in males at about age 20, then slowly declines but remains higher than in healthy females throughout life. Sebum production declines markedly in females after menopause.

The defining symptom and major complaint associated with seborrhea of the scalp is excessive oiliness of the scalp and hair. A greasy-looking scalp is unsightly, and excessively oily hair is both unattractive and difficult to style. In males – young males especially – seborrhea often occurs in conjunction with acne of the face and scalp.

**Acne of the scalp**

Seborrhea can often be managed at home by keeping the scalp clean with shampooing as often as necessary. Some over-the-counter shampoos are labeled for use on oily hair. Seborrhea that is resistant to home treatment should be referred to a physician for examination. Medical treatment may include a medication that reduces sebum synthesis. Additional examination may be necessary if an underlying hormonal dysfunction is suspected.

While acne is most often an eruption on the faces of adolescents and young adults, severe forms that cause deep scarring can involve the scalp. Scalp involvement can occur at any age from adolescence to age 50 or older.

The cause of acne is not known with precision, but acne is commonly associated with seborrhea and excessively oily skin. The severe forms of acne that may affect the scalp should be treated by a dermatologist. Severe acne lesions on the scalp may destroy hair follicles and result in patchy hair loss.

**Itchy scalp**

Causes of itchy scalp are many and the condition is quite common. Finding the exact cause of the itchy scalp is essential in deciding how to treat the scalp itching. Itchy scalp can be caused by a number of diseases, which are diagnosed by the history and nature of scaling, duration of itching, severity of itching, extent of scales, and presence of skin rashes elsewhere on the body. Dry scalp is one of the overlooked causes of itchy scalp. This may be caused by harsh shampoos, hair lotions or tinctures with alcohol as a base, or following frequent shampooing. Itching of the scalp due to dryness is more common during cold, winter months.

The most common causes of itchy scalp are dry scalp, dandruff, seborrheic dermatitis, scalp psoriasis, contact dermatitis, head lice infestation, ringworm of the scalp, tinea amiantacea, lichen planus, hair follicle inflammation, neurogenic excoriation and pyogenic infection of the scalp. Dandruff that carries the yeast infection will also cause itchy scalp.

Needless to say, a definite diagnosis of the condition causing scalp itching is necessary to effectively get rid of the itchy scalp. Lotions that contain 0.5 percent each of camphor and menthol or pramoxine hydrochloride 1 percent, are effective antipruritic agents (with or without 0.5 percent menthol). Hydrocortisone 1 percent or 2.5 percent may be incorporated for its anti-inflammatory effect. Medications beyond these are prescribed by a physician.

**Neurodermatitis**

This is a condition that starts out as a localized area of itching on an area of the scalp that looks normal. Over a period of time, the itchy spot can enlarge as well as become more and more bothersome. For some peculiar reason it tends to occur primarily in the middle of the top of the scalp or along the back of the hairline. Repeated scratching and rubbing of the area lead to hair breakage and a characteristic...
localized patch of shorter, broken-off hair. Neurodermatitis can be mild, causing occasional itching; moderate; or severe, with ongoing, continuous deep itching that never seems to go away.

The true cause of this scalp disorder is not known, but stressful events and situations definitely aggravate it and make it get worse. With repeated rubbing and scratching, the skin can become thickened and darkened so that another condition called lichen simplex chronicus is present. Once this condition becomes more severe, it can be very difficult to stop it. Medical treatment with localized cortisone injections, oral anti-itch medication and topical prescription products can give considerable relief and control the problem. Once the itching stops, then the hair can start to grow back in the affected areas. It can take 6 to 12 months for hair growth to return to normal, depending upon how quickly the hair grows on a normal basis.

Lichen planus

Lichen planus is an inflammatory disorder of the skin that can cause bald, scarring patches on the scalp. The cause of lichen planus is unknown, but drug reactions have been blamed. These include sulfonamides, tetracycline, quinidine, NSAIDs, and hydrochlorothiazide.

Hepatitis C infection is found with greater frequency in lichen planus patients than in controls. Allergy to mercury amalgams (dental fillings) can trigger oral lesions identical to lichen planus. This condition appears more often during stress, fatigue, exposure to medicines or chemicals.

Dandruff

Dandruff consists of small white scales that usually appear on the scalp and hair. Dandruff can leave white flakes on the head, neck and shoulders. The medical term for dandruff is pityriasis. If neglected, excessive dandruff can lead to hair loss. Although the nature of dandruff is not clearly understood, it is generally believed to involve an infection of the scalp. It may be a form of a skin condition called eczema, which causes increased shedding of normal scalp skin cells. It can also be caused by a fungal infection. Hormonal or seasonal changes can make dandruff worse.

Dandruff is characterized by the excessive production, shedding and accumulation of surface cells. Instead of growing to the surface to be shed, these horny scales accumulate on the scalp. A sluggish scalp caused by poor circulation, infection, injury, improper diet or poor personal hygiene contributes to dandruff, as does the use of strong shampoos combined with insufficient rinsing.

Treatments include frequent cleansing of the scalp and hair with a mild or medicated shampoo, followed by an antiseptic lotion. Moisturizing scalp treatments may also help soften and loosen the dead skin cells. Dandruff can leave white flakes on the head, neck and shoulders.

Pityriasis amiantacea (tinea amiantacea)

Pityriasis amiantacea is thought to be a hypersensitivity response to a number of scalp diseases, like scalp psoriasis, seborrheic dermatitis or lichen simplex chronicus.

Tinea amiantacea is a misnomer, because fungal infection is rarely a cause for P amiantacea. There is a thick, yellow, crusty flaking of the scalp along with matting of the hairs in the affected areas. Scaling is more prominent than itching in P amiantacea.

Seborrheic dermatitis falls into this same category. However, in severe cases, this condition may affect the skin over the eyebrows, inner cheeks, back and the groin. The condition may or may not be itchy. It is not a fungal infection, although yeast infections have been reported to be associated with it. Patients with HIV infection may develop very severe seborrheic dermatitis.

Dry, itchy, flaky patches occur on the scalp, especially around the hair margins in front and on the sides and in the back. This condition does not usually cause hair loss, but with chronic rubbing and scratching, the hair can begin to thin around the edges. Up to 30 percent of the population is affected with seborrheic dermatitis, but most do not know the condition by name.
Both forms of dandruff are considered contagious and can be spread by the common use of brushes, combs and other personal articles.

<table>
<thead>
<tr>
<th>Seborrheic keratoses (seborrheic warts, age spots)</th>
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<tr>
<td>Seborrheic keratoses are benign plaques, beige to brown or even black, 3-20 mm in diameter, with a velvety or warty surface. They appear to be stuck or pasted onto the skin. They are extremely common, especially in the elderly, and maybe mistaken for melanomas or other types of cutaneous neoplasms. Although they may be frozen with liquid nitrogen or cured if they itch or are inflamed, no treatment is needed.</td>
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<th>Naevus sebaceous</th>
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<td>Naevus sebaceous are birthmarks originating from the oil glands of the skin They are present at birth, initially as a faint yellowish patch that becomes raised and rough and wartlike as the child grows older. It usually appears on the scalp, but can occur on the face and neck occasionally. The lesion is asymptomatic. It often enlarges at puberty, and there is a very small risk of cancer developing on the birthmark during adulthood. Surgical removal is the treatment of choice.</td>
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<th>Atopic dermatitis (eczema)</th>
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<tr>
<td>Atopic dermatitis looks different at different ages and in people of different races. Diagnostic criteria for atopic dermatitis must include pruritus, typical morphology and distribution (flexural lichenification, hand eczema, nipple eczema, and eyelid eczema in adults), onset in childhood, and chronicity. Also helpful are: A personal or family history of atopic disease (asthma, allergic rhinitis, atopic dermatitis). Xerosis-itchyosis. Facial pallor with infraorbital darkening. Elevated serum IgE (cholesterol). Repeated skin infections. Itching may be severe and prolonged. Rough, red plaques, usually without the thick scale and discrete demarcation of psoriasis, affect the face, scalp, neck and upper trunk. The flexural surfaces of elbows and knees are often involved. In chronic cases, the skin is dry, leathery and lichenified. Pigmented persons may have poorly demarcated hypopigmented patches on the cheeks and extremities. In black patients with severe disease, pigmentation may be lost in the lichenified areas. During acute flares, widespread redness with weeping, either diffusely or in discrete plaques, is common. Food allergy is an uncommon cause of flares of atopic dermatitis in adults. Tadioallergosorbent tests (RASTs) or skin tests may suggest dust mite allergy. Atopic dermatitis must be distinguished from seborrheic dermatitis (less pruritic, frequent scalp and face involvement greasy and scaly lesions, and quick response to therapy). Secondary staphylococcal infections may exacerbate atopic dermatitis, and should be considered during hyperacute, weepy flares of atopic dermatitis. Fissuring where the earlobe connects to the neck is a cardinal sign of secondary infection. Because virtually all patients with atopic dermatitis have skin disease before age 5, a new diagnosis of atopic dermatitis in an adult over age 30 should be made cautiously and only after consultation. Atopic patients have hyperirritable skin. Anything that dries or irritates the skin will potentially trigger dermatitis. Atopic individuals are sensitive to low humidity and often get worse in the winter. Adults with atopic disorders should not bathe more than once daily. Soap should be confined to the armpits, groin, scalp and feet. Washcloths and brushes should not be used. After rinsing, the skin should be patted dry (not rubbed) and then immediately – within three minutes – covered with a thin film of an emollient such as Eucerin, petrolatum or a corticosteroid as needed. Vanicream can be used if contact dermatitis resulting from additives in medication is suspected. Scratchy fabrics, including wools and acrylics, may irritate atopic patients. Cottons are preferable, but synthetic blends are also tolerated. Other triggers of eczema in some patients include sweating, ointments, hot baths, and animal danders. In adults, food allergy is a very uncommon cause of atopic dermatitis or its flares. Once symptoms have improved, constant application of effective moisturizers is recommended to prevent flares. In patients with moderate disease, weekend only use of topical corticosteroids can prevent flares. Atopic dermatitis runs a chronic or intermittent course. Affected adults may have only hand dermatitis. Poor prognostic factors for persistence into adulthood in atopic dermatitis include onset early in childhood, early generalized disease, and asthma. Only 40-60 percent of these patients have lasting remission.</td>
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<th>Contact dermatitis and skin allergies</th>
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<td>Contact dermatitis is an inflammatory condition caused by an external agent. Irritant contact dermatitis of the scalp can occur from overuse of medicated shampoo, chemicals, e.g., bleaching lotion, perm lotion and excessive heat applied to the scalp. Many topical preparations for the hair and scalp can cause skin allergies. The most common cause of allergic contact dermatitis of the scalp is hair dye allergy. Other possible allergens are fragrance in hair lotion, chemical in perm lotion, and medicaments and preservatives in shampoos and hair/scalp lotions. Dermatitis presents as itchy, scaly red patches on the scalp, hairline and ears. In the acute phase, vesicles and swelling may occur. Eyelid swelling may also be seen. Contact dermatitis is an acute or chronic dermatitis that results from direct contact with chemicals or allergens. Eighty percent of cases are due to excessive exposure to or additive effects of primary or universal irritants (e.g., soaps, detergents, organic solvents) and are called irritant contact dermatitis. This appears red and scaly but not vesicular. The most common causes of allergic contact dermatitis are poison ivy and poison oak; topically applied antimicrobials (especially bacitracin and neomycin), anesthetics (benzocaine); hair-care products; preservatives; jewelry (nickel); rubber; vitamin E; essential oils, propolis (from bees); and adhesive tape. Occupational exposure is an important cause of allergic contact dermatitis. Seeping and crusty are typically due to allergic and not irritant dermatitis.</td>
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<th>Symptoms and signs</th>
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<td>In allergic contact dermatitis, the acute phase is characterized by tiny vesicles and weepy and crusted lesions; resolving or chronic contact dermatitis presents with scaling, erythema and possibly thickened skin. Itching, burning, and stinging may be severe.</td>
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Psoriasis

Psoriasis is a common, benign and chronic inflammatory skin disease with a genetic basis. It is characterized by an increased rate of skin cell turnover. It presents as plaques with thick scales appearing on the skin and scalp. The skin lesions appear as discrete scaly plaques on the scalp and along the hairline and often extend to the skin of the forehead and sides of the scalp. The plaques are pink and covered by silvery scales. Psoriasis is usually non-itchy. The degree of involvement can range from a small area the size of a dime to near total involvement of the scalp surface. Despite extreme amounts of scaling and flaking, many individuals affected with psoriasis never have any itching and never have hair loss.

The psoriasis process is related to an ongoing overproduction of skin cells in the upper layer of the skin (epidermis). This process does not affect the hair follicles themselves either directly or indirectly. Injury or irritation of normal skin tends to induce lesions of psoriasis at the site (Koebner phenomenon). Psoriasis has several variants – the most common is the plaque type. Eruptive (guttate) psoriasis consisting of myriad lesions 3-10 mm in diameter occurs occasionally after streptococcal pharyngitis. Rarely, grave and occasionally life-threatening forms (generalized pustular and erythrodermic psoriasis with abrupt onset) may accompany HIV infection.

There are often no symptoms, but if itching does occur, it can be severe. favored sites include the scalp, elbows, knees, palms and soles, and nails. The combination of red plaques with silvery scales on the elbows and knees with scaliness in the scalp or nail findings is diagnostic. Psoriasis lesions are well demarcated and affect extensor surfaces, in contrast to atopic dermatitis, with poorly demarcated plaques in flexural distribution. In body folds, scraping and culture for Candida and examination of scalp and nails will distinguish psoriasis from intertrigo and candidiasis.

There are many therapeutic options in psoriasis to be chosen according to the extent (body surface area affected) and the presence of other findings (for example, arthritis). In general, patients with moderate to severe psoriasis should be managed by or in conjunction with a dermatologist.

Discoid and subacute lupus erythematosus

The two most common forms of chronic cutaneous lupus erythematosus (CCLE) are chronic scarring (discoid) lesions (DLE) and erythematous non-scarring red plaques (subacute cutaneous LE) (SCLE). Both occur most frequently in areas exposed to solar irradiation. Permanent hair loss and loss of pigmentation are common sequelae of discoid lesions.

Symptoms are usually mild. The lesions consist of dusky red, well-localized, single or multiple plaques, 5 mm in diameter, usually on the head in DLE and the trunk in SCLE. In DLE, the scalp, face and external ears may be involved. In discoid lesions, there is atrophy, depigmentation and follicular plugging. On the scalp, significant permanent hair loss may occur in lesions of DLE.

Prevention: Prompt and thorough removal of the causative substance is necessary to stop the spread of the condition. In addition, a applying a neutralizing agent will greatly reduce the spread of the reaction. A skin sensitivity test (patch test) should be accomplished before any further services are performed. People should consult their doctor if they have symptoms of contact dermatitis for treatment and investigations to ascertain the cause of the dermatitis.

For the scalp, start with a tar shampoo, used daily if possible. For thick scales, use 6 percent salicylic acid gel (e.g. Keralt), P & S solution (phenol, mineral oil, and glycerin) at night under a shower cap at night, and shampoo in the morning.

Psoriasis affecting 10-30 percent of the patient’s BSA is frequently treated with UV phototherapy, either in a medical office or via a home light unit. If psoriasis involves greater than 30 percent of the body surface, it is difficult to treat with topical agents. The treatment of choice is outpatient narrowband UVB (NB-UVB) three times weekly. Clearing occurs in an average of seven weeks, but maintenance may be required.

We bring these treatment options to your attention only so that you can be an advisor to your clients. Many new therapies have been successful now that were not available in the past. Your client will be grateful for your expanded knowledge.

The course of psoriasis tends to be chronic and unpredictable, and the disease may be refractory to treatment. Patients should be monitored for metabolic syndrome, which occurs more commonly in psoriasis patients. Needless to say, complete sanitation regimen must be followed, and no harsh chemical processes (i.e., perms, bleaches and hair color) can be administered. This is a general rule whenever you approach broken skin. It is better to refuse these services than to exacerbate any of the present conditions.

Here, it is important to note that psoriasis of the scalp usually has a distinctive appearance of inflamed skin overlain with silvery scales. In severely progressive disease, the psoriatic lesions may merge into a solid mass of scales over the entire scalp, with temporary or permanent hair loss.

Psoriasis of the scalp and seborrheic dermatitis of the scalp have many features in common and may be confused unless properly diagnosed. Atopic dermatitis, an inflammatory, extremely pruritic skin disease, may also resemble psoriasis; scalp involvement in atopic dermatitis is more frequent in infants and children but does occur also in adults. Because treatment is different for each of these diseases, correct diagnosis is essential to appropriate treatment.
DISEASES OF THE SCALP

Bacterial and viral infections of the scalp

Various types of bacteria, some that live normally and harmlessly on the skin, can become invasive and cause infection. Staphylococci (“staph”) are frequent offenders; when they infect the scalp, the result is often folliculitis (inflammation of the hair follicles), with or without abscess formation. Skin is inflamed and painful around the infected follicles. Persistent folliculitis can lead to permanent hair loss. Treatment with antibiotics is usually necessary.

Bacterial infection of the hair follicles causes folliculitis, or inflammation of the hair follicles/pores. Folliculitis presents as pimple-like eruptions on the scalp. The small, discrete red bumps are painful and tender and are often scattered on different areas of the scalp. Pustules may also be seen.

Some individuals are more susceptible to such infection than others. If the infection becomes too frequent, tests should be carried out to ascertain whether there is any abnormality in the person’s immune system.

Folliculitis can be effectively treated with appropriate oral antibiotics. Good hygiene, regular washing of the scalp and hair with mild antiseptic shampoo will help prevent recurrences. Occasionally, longterm oral antibiotics may be necessary to suppress infections.

Viral scalp infection may be due to herpes simplex (the “cold sore” virus), or herpes zoster (the “shingles” virus). Symptoms may include folliculitis. Herpes zoster infection produces inflamed and extremely painful lesions on the skin – a classic symptom of shingles. Anti-viral medication may be prescribed after appropriate diagnosis.

Acne keloidalis nuchae

This is a condition that is associated with the development most often at the back of the scalp along the hairline. The majority of individuals affected with this condition are males who get the condition because of localized trauma caused by sharp razors or clippers. However, this condition also occurs in females who have never used a razor or edged up the hair along the neckline.

Once the individual hair follicles become infected, keloid formation (heavy scarring) can occur, causing hard bumps of scar tissue. The process can remain localized or it can continue to spread and create larger growths of scar tissue and subsequent hair loss. It is important to eliminate the cause of the condition as well as treat it early to stop pain, itching, bleeding, and progressive damage to hair follicles.

Wherever this condition is present, it usually is a result of a primary assault to the skin. Infection entering broken skin, acne and contact dermatitis are just a few instances that are the precursors to this condition.

Vegetable parasitic infections (tinea)

Tinea is the medical term for ringworm. It is characterized by itching, scales, and sometimes, painful circular lesions. Several such patches may be present at one time. Ringworm is caused by vegetable parasites (fungi).

All forms of tinea are contagious and can be easily transmitted from one person to another. Infected skin scales or hairs that contain the fungi are known to spread the disease. Bathtubs, swimming pools and unsanitary personal articles are also sources of transmission. Practicing approved sanitation and disinfection procedures will help prevent the spread of this disease. A client with this condition should be referred to a physician for medical treatment. Above all, do not service this client if this is suspected.

Tinea capitis is commonly known as ringworm of the scalp. Tinea capitis is the medical term for ringworm or fungus infections of the scalp. The condition can cause only mild flaking that looks like dandruff, or patches of hair loss with itching and flaking or areas of infection with pus bumps or red swollen lumpy areas of the scalp. It is characterized by red papules, or spots, at the opening of the hair follicles. The patches spread, and the hair becomes brittle and lifeless. Hair often breaks off, leaving only a stump, or may be shed from the enlarged open follicle.

Tinea favosa, also known as tinea favus or honeycomb ringworm, is characterized by dry, sulfur-yellow, cup-like crusts on the scalp called scutula, which have a distinctive odor. Scars from favus are bald patches that may be pink or white and shiny.

While many topical antifungal medications are available over the counter, it is usually necessary for medication to be taken internally to clear most of these scalp infections. Early treatment can prevent the possibility of permanent hair loss when the disease process becomes more advanced.

Animal parasitic infections

Scabies “itch” is a highly contagious skin disease caused by the itch mite burrowing under the skin. Vesicles (blisters) and pustules (inflamed pimpls with pus) usually form on the scalp from the irritation caused by this animal parasite. Excessive itching results in scratching the infected areas and makes the condition worse. Scabies is caused by infestation with Sarcoptes scabiei. The infestation usually spares the head and neck (though even these areas may be involved in infants, in the elderly, and in patients with AIDS).

Scabies is usually acquired by sleeping with or in the bedding of an infested individual or by other close contact. The entire household may be affected. Hospital-associated scabies is increasingly common,
Bacterial folliculitis

This is a scalp disease associated with the overgrowth of harmful bacteria inside of the hair follicles. It is the more severe condition than described above. This shows up on the scalp as pus-containing bumps with a hair growing out of the middle of them. The degree of involvement can range from one single hair bump to diffuse involvement of the scalp with hundreds of infected hair follicles present.

Pain is one of key symptoms associated with bacterial infection of the scalp, so people who are affected might notice tenderness to the touch or sore spots when combing or brushing their hair. At times, the lesions can actually bleed or drain a liquid material.

The two most common types of staphylococci infections are furuncles and carbuncles.

General considerations

A furuncle (boil) is a deep-seated infection (abscess) caused by S. aureus and involving the entire hair follicle and adjacent subcutaneous tissue. The most common sites of occurrence are the hairy parts exposed to irritation and friction, pressure or moisture. Because the lesions are autoinoculable, they are often multiple.

Diabetes mellitus (especially if using insulin injections), injection drug use, allergy injections, and HIV disease all increase the risk of staphylococcal infections by increasing the rate of carriage. Certain other exposures, including hospitalizations, athletic teams, prisons, military service and homelessness, may also increase the risk of infection.

A carbuncle consists of several furuncles developing in adjoining hair follicles and coalescing to form a conglomerate, deeply situated mass with multiple drainage points.
Clinical findings

- **Symptoms and signs**
  Pain and tenderness may be prominent. The abscess is either rounded or conical. It gradually enlarges, becomes fluctuant, and then softens and opens spontaneously after a few days to 1-2 weeks to discharge a core of necrotic tissue and pus. The inflammation occasionally subsides before necrosis occurs.

- **Laboratory findings**
  There may be slight leukocytosis, but a white blood cell count is rarely required. Pus should be cultured to rule out MRSA or other bacteria.

- **Differential diagnosis**
  The most common entity in the differential is an inflamed epidermal inclusion cyst that suddenly becomes red, tender, and expands greatly in size over one to a few days. The history of a prior cyst in the same location, the presence of a clearly visible cyst orifice, and the extrusion of malodorous cheesy rather than purulent material helps in the diagnosis.

- **Complications**
  Serious and sometimes fatal complications of Staphylococcal infection such as septicemia (blood poisoning) can occur.

- **Prevention**
  Identifying and eliminating the source of infection is critical to prevent recurrences after treatment. The source individual may have chronic dermatitis or be an asymptomatic carrier. Local measures such as meticulous hand washing; no sharing of towels and clothing; aggressive scrubbing of bathrooms and surfaces with bleach; and cleaning all surfaces with bleaching cleaners are recommended.

  - This should be referred to a physician.

**Impetigo**

Impetigo is a contagious and autoinoculable infection of the skin caused by staphylococci or streptococci. The lesions consist of macules, vesicles, bullae, pustules and honey-colored, gummy crusts that when removed leave demoded red areas. The face and other exposed parts are most often involved. Ecthyma is a deeper form of impetigo caused by staphylococci or streptococci, with ulceration and scarring. It occurs frequently on the extremities.

While this disease should be treated only by a physician, it is relevant to advise that great care within a family and public places must be taken. Linens and clothing should be washed in hot water with detergent and bleach. The addition of bleach to the bath water (1/2 to 1 cup per 20 liters) and cleaners containing bleach on all surfaces is recommended.

**Solar keratoses**

Solar keratoses are pre-cancerous skin lesions on sun-exposed skin of the face and scalp. On the scalp, they occur on balding individuals where chronic sun exposure occurs. They are often seen in fair-skinned individuals who have had exposure to sunlight for many years. They often occur in middle-aged and older individuals.

Solar keratoses present as ill-defined red scaly patches on the skin. The surface of the lesion looks and feels rough (akin to sandpaper). The lesion is painless and not itchy. If left untreated, solar keratosis may develop into skin cancer.

Solar keratoses must be destroyed to stop cancerous transformation. It is usually destroyed with liquid nitrogen applications or topical anti-cancer cream, e.g., 5-fluorouracil. Patients with solar keratoses must avoid further sun exposure. Patients should avoid midday sun exposure and use sunscreen daily. They should consult their doctor regularly to get treatment whenever new lesions occur. A skin biopsy may be necessary to ascertain whether a cancer has developed.

**Angiosarcoma**

This is a rare blood vessel cancer of the skin. It tends to appear on the scalp, face and ears. It usually occurs in elderly patients, and it commonly presents as single or grouped bluish-red nodules or plaques on the scalp, face or ears. The lesions may occasionally be mildly tender but are often painless. Early diagnosis is essential to improve the prognosis of such patients. A skin biopsy is essential to confirm the diagnosis.

Patients with angiosarcoma are referred to the oncologist for treatment. Localized lesions can be removed by surgery, but large lesions need radiotherapy. The prognosis of angiosarcoma is poor generally.

**PRINCIPLES OF PREVENTION**

There is no better way for a salon to make a good first impression than to maintain the highest level of cleanliness. This makes a positive statement that fills clients with confidence.

There is more to a clean salon, however, than a well-swept floor or vacuumed rugs. Proper care must be taken to meet rigorous health standards. Otherwise, the salon could be contributing to the spread of disease.

**Decontamination**

Almost everything in the salon presents a surface of some kind. These surfaces may seem clean, but no matter how clean they appear to the naked eye, chances are they are contaminated.

Surfaces of tools or other objects that are not free from dirt, oils and microbes are covered with contaminants, which are any substances that can cause contamination. Many things can be contaminants, such as hair left in a comb, make-up on a towel or brush, or nail dust on the floor.

Tools and other surfaces in the salon can also be contaminated with bacteria, viruses, and fungi. Even tools that appear to be clean are usually covered with these microorganisms.

Of course, a salon can never be completely free from all contamination, and it would not make sense to attempt such a goal. However, it is your responsibility as a salon professional to be on constant alert for disease-causing contaminants.
The removal of pathogens and other substances from tools and surfaces is called **decontamination**. Decontamination involves the use of physical or chemical means to remove, inactivate or destroy pathogens so that the object is rendered safe for handling, use or disposal. There are three main levels of decontamination: sterilization, disinfection and sanitation. Only disinfection and sanitation are required in the salon.

### Disinfection

**Disinfection** is a higher level of decontamination than sanitation. It is second only to sterilization. Disinfection controls microorganisms on hard, nonporous surfaces such as cuticle nippers and other salon implements.

Disinfection provides the level of protection required by the salon to kill most organisms, with one exception. Disinfection does not kill bacterial spores, but this is not necessary in the salon environment. It is important only in hospitals and other health-care facilities where instruments are used to penetrate or cut the skin.

**Disinfectants** are chemical agents used to destroy most bacteria and some viruses and to disinfect implements and surfaces. **Disinfectants are not for use on human skin, hair or nails.** Never use disinfectants as hand cleaners. Any substance powerful enough to quickly and efficiently destroy pathogens can also damage skin.

There are a variety of disinfectants that the salon can choose to use:
- Quaternary ammonium compounds.
- Phenols.
- 70 percent alcohol.
- Bleach.
- Approved ultraviolet light appliance.

No matter what the choice or application, follow the manufacturer’s directions for dilution and use.

### Sanitation

The third, or lowest, level of decontamination is called **sanitation** or **sanitizing**. These words are often frequently misused and misunderstood. To sanitize means “to significantly reduce the number of pathogens or disease-producing organisms found on a surface.” Cleaning with soaps and detergents will sanitize salon tools, capes, towels and other surfaces.

Sanitized surfaces may still harbor pathogens or other organisms. Removing hair from a brush and washing the brush with detergent is considered sanitation. Placing the brush in Barbicide solution for the required time is considered disinfection.

Putting antiseptics designed for hands or feet on your skin or washing your hands is another example of sanitation. Your hands may appear very clean when you are finished, but will still harbor pathogens found in tap water and on the towel.

### Universal precautions

Many infectious diseases do not present visible symptoms on the infected person. Because you will not necessarily be able to identify clients with infectious diseases, the same infection control practices should be used with all clients.

OSHA sets the standard that must be used in the industry for dealing with blood-borne pathogens. The standard prescribes the use of universal precautions as the approach to infection control. **Universal precautions** are a set of guidelines and controls, published by the Centers for Disease Control and Prevention (CDC), that require the employer and the employee to assume that all human blood and specified human body fluids are infectious for HIV, HBV and other blood-borne pathogens. Precautions include hand washing; gloving; use of personal protective equipment such as goggles; injury prevention; and proper handling and disposal of needles. Other sharp instruments and products that have been contaminated by blood or other body fluids must be disposed of correctly.

You have many responsibilities as a salon professional. None is more important than your responsibility to protect your clients’ health and safety as well as your own. Never take shortcuts when it comes to sanitation and disinfection. Remember, this is a hands-on profession. The beauty of it is that you come into close contact with all sorts of people. This is why a “people” person like you has chosen this field. But you must be wise and careful about this contact. If you are to be an effective practitioner, you must learn the rules – every one of them – and you must always follow them to the letter of the law. This is how you, your colleagues and your clients can maintain a sense of trust and respect for each other.

### STRUCTURE OF THE HAIR

**The integument is the outer covering that encloses the entire body.** It includes the hair, skin and nails and is the largest and fastest-growing organ of the human body. Full-grown human hair is divided into two parts: The hair root and the hair shaft. The hair root is the part of the hair located below the surface of the scalp. The hair shaft is the portion of the hair that projects above the skin.

#### Structures of the hair root

The main structures of the hair root are the follicle, bulb, papilla, arrector pili muscle, and sebaceous glands.

The **follicle** is the tube-like depression or pocket in the skin or scalp that contains the hair root. Hair follicles are distributed all over the body, with the exception of the palms of the hands and the soles of the feet. The follicle extends downward from the epidermis (the outer layer of the skin) into the dermis (the inner layer of the skin), where it surrounds the dermal papilla. It is not uncommon for more than one hair to grow from a single follicle.

The **hair bulb** is the lowest area or part of a hair strand. It is the thickened, club-shaped structure that forms the lower part of the hair root. The lower part of the hair bulb fits over and covers the dermal papilla.

The **dermal papilla** (plural: papillae) is a small, cone-shaped elevation located at the base of the hair follicle that fits into the hair bulb. The dermal papilla contains the blood and nerve supply that provides the nutrients needed for hair growth.

The **arrector pili** is a minute, involuntary muscle fiber in the skin inserted in the base of the hair follicle. Fear or cold causes it to contract, which makes the hair stand up straight, resulting in “goose bumps.”
Sebaceous glands are the oil glands of the skin, connected to the hair follicles. The sebaceous glands secrete an oily substance called sebum, which lubricates the hair and skin.

**Structures of the hair shaft**

As a reminder, let’s review the structures of the hair shaft. The three main layers of the hair shaft are the cuticle, cortex, and the medulla (if present).

The cuticle is the outermost layer of the hair. It consists of a single, overlapping layer of transparent, scale-like cells that overlap like shingles on a roof. A healthy, compact cuticle layer is the hair’s primary defense against damage. Swelling the hair raises the cuticle layer and opens the space between the scales, which allows liquid to penetrate. Many times the cuticle layer will contain an abundance of cells. This is seen in white hair and very coarse hair and makes the hair difficult to approach with chemicals.

A healthy cuticle layer protects the hair from penetration and prevents damage to hair fibers. Oxidation hair colors, bleaches, permanent waving and chemical hair relaxing must have an alkaline pH in order to penetrate the cuticle layer and reach their target within the cortex.

**The chemical composition of hair**

Hair is composed of protein that grows from cells originating within the hair follicle. This is where the hair shaft begins. As soon as these living cells form, they begin their journey upward through the hair follicle. They mature in a process called keratinization. As these newly formed cells mature, they fill up with a fibrous protein called keratin, then move upward, lose their nucleus, and die. By the time the hair shaft emerges from the scalp, the cells of the hair are completely keratinized and no longer living. The hair shaft that emerges from the scalp is a nonliving fiber composed of keratinized protein.

Hair is approximately 91 percent protein. The protein is made up of long chains of amino acids, which, in turn, are made up of elements.

The elements that make up human hair are carbon (51 percent), oxygen (21 percent), hydrogen (6 percent), nitrogen (17 percent), and sulphur (5 percent). These five elements are also the major elements found in the hair of the same individual.

**The side bonds of the cortex**

The cortex is the middle layer of the hair. It is a fibrous protein core formed by elongated cells containing melanin pigment. About 90 percent of the total weight of hair comes from the cortex. The elasticity of the hair and its natural color are the result of the unique protein structures located within the cortex. The changes involved in oxidation hair coloring, wet setting, thermal styling, permanent waving, and chemical hair relaxing all take place within the cortex.

The medulla is the innermost layer, sometimes referred to as the pith of the hair. It is composed of round cells. It is quite common for very fine and naturally blonde hair to entirely lack a medulla. The same is true of children’s hair, before puberty. Generally, only thick, coarse hair contains a medulla. All male beard hair contains a medulla. Beard hair is generally much coarser than and not as uniform as hair from the head of the same individual.

**Hair growth**

The two main types of hair found on the body are vellus (lanugo) and terminal hair.

- **Vellus** or lanugo hair is short, fine and downy. Vellus hair is not pigmented and almost never has a medulla. It is commonly found on infants and can be present on children until puberty. On adults, vellus hair is usually found in places that are normally considered hairless (forehead, eyelids and bald scalp), as well as nearly all other areas of the body except the palms of the hands and the soles of the feet. Women retain 55 percent more vellus hair than men.

- **Terminal hair** is the long, soft hair found on the scalp, legs, arms and bodies of males and females. Terminal hair is coarser than vellus hair, and with the exception of gray hair, it is pigmented. It usually has a medulla and is easily distinguished from vellus by its dark color and coarse texture. Hormonal changes during puberty cause some areas of fine vellus hair to be replaced with thicker terminal hair, depending on genetics, age and hormonal changes.

Polypeptide chains intertwine around each other in a spiral shape called a helix. The chemical bond that joins amino acids, the units of structure in protein, are linked together end to end like pop beads. The chemical bond that joins amino acids to each other is called a peptide bond or end bond. A long chain of amino acids linked by peptide bonds is called a polypeptide chain.
THE GROWTH CYCLES OF HAIR

Hair growth occurs in cycles. Each complete cycle has three phases that are repeated over and over again throughout life. The hair of the scalp is programmed to produce approximately 25 cycles, each lasting about four years. The three phases of a cycle are anagen, catagen and telogen.

Anagen: The growth phase

During the anagen, or growth, phase, new hair is produced. The hair actively manufactures new keratinized cells in the hair follicle. This phase lasts from one to five years, but in some cases, it can last as long as 10 years. Scaly hair grows faster on women than on men. Scalp hair grows rapidly between the ages of 15 and 30, but slows down sharply after the age of 50.

About 90 percent of scalp hair is growing in the anagen phase at any one time. For each specific hair, the anagen phase generally lasts from three to five years, but in some cases, it can last as long as 10 years.

Catagen: The transition phase

The catagen phase is the brief transition period between the growth and resting phase of a hair follicle. It signals the end of the growth phase. During the catagen phase, the follicle canal shrinks and detaches from the dermal papilla. The hair bulb disappears and the shrunken root end forms a rounded club.

Less than 1 percent of scalp hair is in the catagen phase at any one time. The catagen phase is very short and lasts from one to two weeks.

Telogen: The resting phase

The telogen, or resting, phase is the final phase in the hair cycle and lasts until the fully grown hair is shed. The hair is either shed during the telogen phase or remains in place until the next anagen phase, when the new hair growing in pushes it out.

About 10 percent of scalp hair is in the telogen phase at any one time. The telogen phase lasts for approximately three to six months. As soon as the telogen phase ends, the hair returns to the anagen phase and begins the entire cycle again. On average, the entire growth cycle repeats itself once every four or five years.

HAIR AND SCALP ANALYSIS

All successful salon services must begin with a thorough analysis of the client’s hair type and the present condition of the hair and scalp in order to determine beforehand the results that can be expected from the service. Because different types of hair react differently to the same service, it is essential that a thorough analysis be performed prior to all salon services. Hair and scalp analysis is performed by observation, using the senses of sight, touch, hearing and smell. The four most important factors to consider in hair analysis are texture, porosity, elasticity and density. The factors for scalp analysis should include dryness, oiliness, flaking, tightness, sights of broken skin and hair, lack of hair, and presence of disorders and diseases.

Hair texture

Hair texture is the thickness or diameter of the individual hair strands. Hair texture can be classified as coarse, medium or fine and differs from individual to individual. Hair texture can also vary from strand to strand on the same person’s head. It is not uncommon for hair from different areas of the head to have different textures. Hair from the nape (back of the neck), crown, temples and front hairline of the same person may all have different textures.

Coarse hair texture has the largest diameter. It is stronger than fine hair, for the same reason that thick rope is stronger than thin rope. Coarse hair also has a stronger structure. It usually requires more processing than medium or fine hair and may also be more resistant to that processing. It is usually more difficult for hair lighteners, hair colors, permanent waving solutions, and chemical hair relaxers to penetrate coarse hair.

Medium hair texture is the most common and is the standard to which other hair is compared. Medium hair is considered normal and does not pose any special problems or concerns.

Fine hair has the smallest diameter and is more fragile, easier to process, and more susceptible to damage from chemical services than coarse or medium hair.

Hair texture can be determined by feeling a single dry strand between the fingers. Take an individual strand from four different areas of the head – the front hairline, the temple, the crown, and the nape – and hold the strand securely with one hand while feeling it with the thumb and forefinger of the other hand. With a little practice, you will be able to feel the difference between coarse, medium, and fine hair diameters.

Hair density

Hair density measures the number of individual hair strands on one square inch of scalp. It indicates how many hairs are on a person’s head. Hair density can be classified as low, medium or high (or thin, medium or thick-dense). Hair density is different from hair texture in that different individuals with the same hair texture can have different densities. Some individuals may have coarse hair texture (each hair has a large diameter), but low hair density (a low number of hairs on the head). Others may have fine hair texture (each hair has a small diameter), but high hair density (a number of hairs on the head).

The average hair density is about 2,200 hairs per square inch. Hair with high density (thick or dense hair) has more hairs per square inch. Hair with low density (thin hair) has fewer hairs per square inch. The average head of hair contains about 100,000 individual hair strands. The number of hairs on the head generally varies with the color of the hair. Blondes usually have the highest density, and redheads tend to have the lowest.
Hair porosity

Hair porosity is the ability of the hair to absorb moisture. The degree of porosity is directly related to the condition of the cuticle layer. Healthy hair with a compact cuticle layer is naturally resistant to penetration. Porous hair has a raised cuticle layer that easily absorbs water.

Hair with low porosity is considered normal. Chemical services performed on this type of hair will usually process as expected, according to the texture.

Hair with high porosity is considered overly porous and is the result of previous overprocessing. Overly porous hair is damaged, dry, fragile and brittle. Chemical services performed on overly porous hair require less alkaline solutions with a lower pH. This will help prevent additional overprocessing.

Hair elasticity

Hair elasticity is the ability of the hair to stretch and return to its original length without breaking. Hair elasticity is an indication of the strength of the side bonds that hold the hair’s individual fibers in place. Wet hair with normal elasticity will stretch up to 50 percent of its original length and return to that same length without breaking.

Hair with normal elasticity holds the curl from wet sets and permanent waves without excessive relaxing.

Hair with low elasticity is brittle and breaks easily. Hair with low elasticity may not be able to hold curl from wet setting, thermal styling or permanent waving. Hair with low elasticity is the result of weak side bonds that usually result from previous overprocessing. Chemical services performed on hair with low elasticity require a milder solution with a lower pH. Such a solution minimizes damage and helps prevent additional overprocessing.

Check elasticity on wet hair by taking an individual strand from four different areas of the head (the front hairline, the temple, the crown and the nape). Hold the strand securely with one hand from the end to the scalp. If the hair feels smooth and the cuticle is compact, dense and hard, it is considered resistant. If you feel a slight roughness, it is considered overly porous.

Hair loss

Under normal circumstances, we all lose some hair every day. Normal daily hair loss is the natural result of the three phases of the hair’s growth cycle. The growth cycle provides for the continuous growth, fall, and replacement of individual hair strands. Hair that is shed in the telogen phase is replaced by a new hair in the same follicle in the next anagen phase. This natural shedding of hair accounts for normal daily hair loss. Although estimates of the rate of hair loss have long been quoted at 100 to 150 hairs per day, recent measurements indicate that the average rate of hair loss is closer to 35 to 40 hairs per day.

More than 63 million people in the United States suffer from abnormal hair loss (alopecia). As a professional, it is likely that you will be the first person that many of these people come to with questions about their hair loss. It is important that you have a basic understanding of the different types of hair loss and the products and services that are available.

The emotional impact of hair loss

Although the medical community does not recognize hair loss as a medical condition, the anguish felt by many of those who suffer from abnormal hair loss is very real, and all too often overlooked. Results from a study that investigated perceptions of bald and balding men showed that compared to men who had hair, bald men were perceived as:

- Less physically attractive (by both sexes).
- Less assertive.
- Less successful.
- Less personally likable.
- Appearing older (by five years).

Results of a study investigating how bald men perceive themselves showed that greater hair loss had a more significant impact than moderate hair loss. Men with more severe hair loss:

- Experience significantly more negative social and emotional effects.
- Are more preoccupied with their baldness.
- Make some effort to conceal or compensate for their hair loss.

For women, abnormal hair loss is particularly devastating. Women who experience hair loss try to disguise it from everyone, even their doctor. Women also tend to worry that their hair loss is a symptom of a serious illness. Studies indicate that women have a greater emotional investment in their appearance, and although abnormal hair loss is not as common in women as it is in men, it can be very traumatic. The vast majority of women with abnormal hair loss feel anxious, helpless and less attractive. Many think they are the only ones who have the problem.

Types of abnormal hair loss

Abnormal hair loss is called alopecia. The most common types of abnormal hair loss are:

- Cicatricial alopecia.
- Androgenetic baldness.
- Telogen effluvium.
- Alopecia areata.
- Trichotillomania.

Cicatricial alopecia (baldness due to scarring)

Cicatricial baldness may occur following chemical or physical trauma, lichen, planopilaris, bacterial or fungal infections, severe herpes zoster, chronic DLE, scleroderma, and excessive ionizing radiation. The specific cause is often suggested by the history, the distribution of hair loss, and the appearance of the skin, as in lupus erythematosus. Biopsy
is useful in the diagnosis of scarring alopecia, but specimens must be taken from the active border and not from the central zone.

Scarring alopecias are irreversible and permanent. It is important to diagnose and treat the scarring process as early in its course as possible.

Dissecting cellulitis

This is a rare scalp condition that is associated with the development of large areas of thickening of the scalp in association with pockets of pus trapped under the skin. While pus is usually associated with the presence of bacteria and infection, in dissecting cellulitis, some of these areas are bacteria-free.

This condition can be very aggressive, leading to large areas of hair loss and a high possibility of causing scarring and permanent baldness because this condition affects the deeper portions of the scalp.

Baldness not associated with scarring

Nonscarring alopecia may occur in association with various systemic diseases, such as SLE, secondary syphilis, hyperthyroidism or hypothyroidism, iron deficiency anemia, and pituitary insufficiency. The only treatment necessary is prompt and adequate control of the underlying disorder, which usually leads to regrowth of the hair.

Androgenetic (pattern) baldness, the most common form of alopecia is of genetic predetermination. The earliest changes occur at the anterior portions of the calvarium on either side of the “widow’s peak” and on the crown (vertex). The extent of hair loss is variable and unpredictable. Minoxidil 5 percent solution is available over-the-counter and can be specifically recommended for persons with recent onset (less than five years) and smaller areas of alopecia. Approximately 40 percent of patients treated twice daily for a year will have moderate to dense growth. Finasteride (Propecia), 1mg orally daily, has similar efficacy and may be additive to minoxidil. As opposed to minoxidil, finasteride is used only in males.

Hair loss or thinning of the hair in women results from the same cause as common baldness in men (androgenetic alopecia) and may be treated with topical minoxidil. A workup consisting of determination of serum testosterone, DHEAS, iron, total iron binding capacity, thyroid function tests, and a complete blood count will identify most other causes of hair thinning in premenopausal women. Women who complain of thin hair but show little evidence of alopecia need follow-up, because more than 50 percent of the scalp hair can be lost before the clinician can perceive it.

Telogen effluvium is transitory increase in the number of hairs in the telogen (resting) phase of the hair growth cycle. This may occur spontaneously, may appear at the termination of pregnancy, may be precipitated by “crash dieting,” high fever, stress from surgery or shock, malnutrition, or may be provoked by hormonal contraceptives. Whatever the cause, telogen effluvium usually has a latent period of 2-4 months. The prognosis is generally good.

The condition is diagnosed by the presence of large numbers of hairs with white bulbs coming out upon gentle tugging of the hair. The scalp looks perfectly normal with this condition, and there are no symptoms except the hair shedding. Hair may be noticed on the pillowcase upon awakening, on the floor, or easily come out while shampooing. Counts of hairs lost by the patient on combing or shampooing often exceed 150 hairs per day, compared to an average of 70-100. In one study, a major cause of telogen effluvium was found to be iron deficiency, and the hair counts bore a clear relationship to serum iron levels.

Alopecia areata is of unknown cause but is believed to be an immunologic process. Typically, there are patches that are perfectly smooth and without scarring. Tiny hairs 2-3mm in length, called “exclamation hairs,” may be seen. Telogen hairs are easily dislodged from the periphery of active lesions. The beard, brows, and lashes may be involved. Involvement may extend to all of the scalp hair (alopecia totalis) or to all scalp and body hair (alopecia universalis). Severe forms may be treated by systemic corticosteroid therapy, although recurrences follow discontinuation of therapy. Alopecia areata is occasionally associated with Hashimoto thyroiditis, pernicious anemia, Addison disease, and vitiligo (lack of pigmentation).

Intralesional corticosteroids are frequently effective for alopecia areata. Trimecinolone in a concentration of 2.5-10mg/mL, is injected in aliquots of 0.1 mL, at approximately 1-2cm intervals, not exceeding a total dose of 30 mg per month for adults. Alternatively, anthralin 0.5 percent ointment, used daily, may help some patients.

Alopecia areata is usually self-limiting, with complete regrowth of hair in 80 percent of patients with focal disease. But some mild cases are resistant to treatment, as are the extensive totalis and universalis types. Both topical diphenhydramine and squaric acid dibutylester have been used to treat persistent alopecia areata. The principle is to sensitize the skin, then intermittently apply weaker concentrations to produce and maintain a slight dermatitis. Hair regrowth in 3-6 months in some patients has been reported to be remarkable. Long-term safety and efficacy have not been established. Support groups for patients with extensive alopecia areata are very beneficial.

In trichotillomania (the pulling out of one’s own hair), the patches of hair loss are irregular, and short growing hairs are always present, since they cannot be pulled out until they are long enough. The patches are often unilateral, occurring on the same side as the patient’s dominant hand. Sometimes this extends to the eyebrows and eyelashes. The patient may be unaware of the habit and is considered to have a mental problem.

Traction folliculitis: Prolonged tension and violent pulling of the hair can lead to injury in susceptible individuals. The earliest sign of injury is localized scaling, flaking, and pus bumps that develop around the base of the hairs that are affected. Amazingly, these areas don’t usually itch or hurt despite significant inflammation being present.

If the source of the tension is not eliminated and the condition continues on a chronic basis, then scarring can occur, which is called traction alopecia. An example of acute traction alopecia comes as a result of a street fight where the hair is yanked out. Sadly, many times the hair follicle is so traumatized that the hair does not grow back.

Other possible causes for excessive hair loss, thinning or breakage include:

- Damage to the hair from hair care products, such as dyes and permanents, and from hot rollers, curling irons and hair dryers.
- Side effects of medicines or medical treatments, such as chemotherapy or radiation therapy.
- Recent surgery, high fever, or emotional stress. You may have a lot of hair loss four weeks to three months after severe physical or emotional stress. This type of hair loss usually stops within a few months.
- Diseases, such as lupus and hypothyroidism (overactive thyroid).
- Heavy metal poisoning, such as thallium or arsenic poisoning.
- Poor nutrition, especially lack of protein or iron in the diet. (Remember that the hair and the nails are the last to receive the body’s nutrition, so these are the first to suffer when the body is not being cared for correctly.)
- Damage to the hair and scalp from burns or other injuries.
Hair loss treatments

Of all the treatments that are said to counter hair loss, there are only two products – minoxidil and finasteride – that have been proven to stimulate hair growth and are approved by the FDA for that purpose.

Minoxidil is a topical (applied to the surface of the skin) medication that is applied to the scalp twice a day, and has been proven to stimulate hair growth. It is sold over-the-counter as a non-prescription drug. Minoxidil is available for both men and women and comes in two strengths: 2 percent regular and 5 percent extra strength. It is not known to have any negative side effects.

Finasteride is an oral prescription medication for men only. Although finasteride is more effective and convenient than minoxidil, possible side effects include weight gain and loss of sexual function. Women may not use this treatment, and pregnant women or those who might become pregnant are cautioned not to even touch the drug because of the strong potential for birth defects.

In addition to the treatments described above, there are also several surgical options available. Transplants, or hair plugs, are probably the most common permanent hair replacement technique. The process consists of removing small sections of hair, including the follicle, papilla and bulb, transplanting them into the bald areas. These sections, or bulbs, grow normally in the new location. Only licensed surgeons may perform this procedure, and several surgeries are usually necessary to achieve the desired results. The cost of each surgery ranges from $8,000 to more than $20,000.

Hairstylists can offer a number of nonmedical options to counter hair loss. Some salons specialize in nonsurgical hair replacement systems, such as wigs, toupees, hair weaving and hair extensions. With proper training, you can learn to fit, color, cut, and style wigs and toupees. Hair weaving and hair extensions allow you to enhance the client’s natural hair and create a look that boosts self-esteem.
DISORDERS AND DISEASES OF THE SCALP
Final Examination Questions
Choose the best answer for the following questions 1 through 10 and mark your answers online at Cosmetology.EliteCME.com.

1. The successful endpoint of inflammation is healing.
   - True    - False

2. The epidermis is the innermost layer of the skin.
   - True    - False

3. Bacteria and viruses can be seen with the naked eye.
   - True    - False

4. A comedone is a disorder of the sebaceous gland.
   - True    - False

5. Psoriasis is a disorder with a genetic base.
   - True    - False

6. Ringworm is a vegetable parasite.
   - True    - False

7. Scabies is a vegetable parasite.
   - True    - False

8. A carbuncle involves many hair follicles.
   - True    - False

   - True    - False

10. The telogen stage is the growing phase of the hair.
    - True    - False