

E-Hair College

Welcome to E-HAIR learning system.

- 1. Read Chapter 7 in Salon Fundamental textbook.**
- 2. Complete Ch. 7 questions in study guide.**
- 3. Read these additional notes.**
- 4. For review go to practice online and review quizzes, puzzles.**
- 5. Study and complete Test.**
- 6. A 70% is required for all theory and practical tests.**

LESSON #6 Trichology

- The structures of the hair root.
- The three layers of the hair shaft.
- The factors that should be considered in a hair analysis.
- The process of hair growth.
- Natural hair color.
- Hair loss
- Scalp disorders and diseases.

Understanding the formation, growth, structure and behavior of hair will help you understand and relay correct information to your clients.

The structures of the hair root.

Epidermis

The outer layer of the skin also known as the scarfskin. The hair root is located in the epidermis of the skin.

Follicle

The tube like depression, or pocket, in the skin or scalp that contains the hair root. Hair is found over the entire body except on the soles of the feet and palms of the hands. The follicles grow downward from the epidermis into the dermis; where it surrounds the dermal papilla. More than one hair can grow from a single follicle.

Hair Bulb

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 bulb fits over and covers the hair root. The lower part of the bulb fits over and covers the dermal papilla.

Dermal Papilla

A small, cone shaped elevation located at the base of the hair follicle that fits into the hair bulb. It contains the blood and nerve supply that provides the nutrients needed for growth.

Arrector Pili muscle

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

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.

Hair Root

The portion of the hair that is inside the hair follicle under the skin's surface.

Hair Shaft/fiber

The portion of the hair that extends above the skin's surface.

The three layers of the hair shaft.

Cuticle

The outermost layer of the hair shaft made up of overlapping layers of transparent scales. It is the outer most layer of hair; consists of a single layer of transparent scale like cells; surrounds the cortex and protects the hair from penetration and damage.

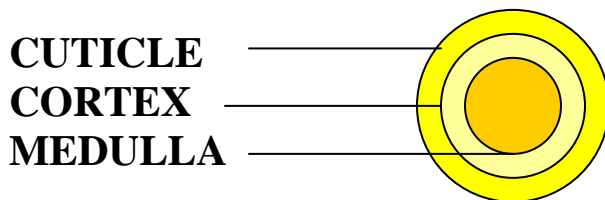
Cortex

The second layer consisting of unique protein structures; gives hair most of its pigment and strength. The cortex contributes about 90 percent of the hair's total weight. The elasticity and natural color is the result of the protein structures located in the cortex.

Medulla

The central core of the hair shaft, also called the pith or marrow (often absent in very fine hair). The innermost portion of the hair; very fine and naturally blonde hair often lack a medulla. The medulla is an empty air space and is not involved in salon services.

HAIR SHAFT



The factors that should be considered in a hair analysis.

HAIR AND SCALP ANALYSIS

PROPERTIES OF HAIR

POROSITY: The ability of the hair to absorb moisture. If hair is too porous it will absorb moisture. If hair is too porous it will absorb product too quickly and damage the hair. Chemicals should not be used on over porous hair.

Use the following porosity ruffle test to determine porosity.

GOOD POROSITY

POOR POROSITY

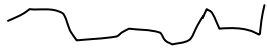


ELASTICITY: The ability of the hair to be stretched and return to its original condition without breaking. If hair breaks easily you should not perm the hair. The wave will be weak and breakage will occur.



TEXTURE: The thinness or thickness of the hair. If hair is coarse it is stronger. Fine hair is usually weaker and must be handled with care. The texture of coarse hair has the feel of wool, medium texture the feel of cotton and fine hair the feel of silk.

Fine



Medium



Coarse



DENSITY:

The number of hairs per square inch on the scalp.

Thin or thick refers to the whole head not just one hair. A person could have fine hair and be very thick.

Average head of hair contains 100,000 hairs.

2200 hairs per square inch is the average.

Average number of hairs per square inch on different colors of hair:

Blonde - 140,000

Brown - 110,000

Black - 108,000

Red - 80,000

The process of hair growth.

Hair begins as a cell; it travels through the hair follicle and is separated into specific types. Some cells will become cuticle scales, others will make up the cortex and others have the formation to be medulla cells.

The cells join to poke through the surface of the skins hair follicle.

Hair is made up of **protein**, which is made from linking together of amino acids. The cortex of the hair is made of chains that take the shape of a helix or coil. These amino acid chains coil around each other and become protofibrils. Protofibrils then twist around each other to become microfibrils. This forms the **cortex of the hair**.

Keratinization is a process whereby cells change their shape, dry out and form keratin protein. Once keratinized, the cells that form the hair fiber or strand are no longer alive.

Anogen is the active growing stage where the hair bulb has an attached root sheath. This stage lasts for two to six years. Hair color is darker in the anogen stage.

Catogen when all cell division stops. This lasts only a few weeks.

Telogen is the resting stage; the hair bulb has no attached root sheath. At this time the hair falls out. 10-15% of hair is in the resting stage which lasts 3-4 months.

Poor Health can affect the hair growth. If sufficient vitamins and minerals are not in the body it will affect the way the hair grows and cause the hair to become weak and brittle. Certain chemical applications should not be given when the hair is in this condition.

Hair color.

Melanins gives hair and skin its color, it is found mainly in the cortex.

Melanin is produced by **melanocytes**, cells that exist among the dividing cells within the hair bulb.

Melanosomes are melanocytes that rest near the hair bulb's nourishment centre, the dermal papilla; they collect together and form bundles of a pigment protein complex. The size, type and distribution of these melanosomes will determine the natural color of the hair.

Two types of melanin:

Eumelanin is brown/black in color

Phemelanin is red in color. People with very dark, black hair may even have melanin in the cuticle layer, while lighter hair has melanin only in the cortex.

Albino occurs when there is total lack of pigment in the hair and skin.

Gray Hair is created when there is a lack of color pigment in the cortex of the hair. Hair turns gray in the papilla and extends through the skin already gray.

Gray hair is most often hereditary and comes along with aging. Some people turn gray prematurely and this can be genetic, caused from illness or emotional conditions; and also extreme fear.

Sun bleached hair is caused from extreme sun rays on the hair shaft. It lightens the hair and removes the color pigment by fading the hair. This is very harmful to the hair and can cause the hair to become very porous.

Hair Loss

Normal daily hair loss is the natural result of the three phases of the hair's growth cycle. A new hair, in that same follicle, replaces hair that is shed in the telogen phase in the next anagen phase.

- Between 40 and 100 strands of hair is the average daily hair loss. The average head of hair has 100,000 strands of hair.
- Alopecia is abnormal hair loss.

The most common types are:

Alopecia Areata

- Loss of hair in patches in a round or irregular shape; may occur on scalp or anywhere else on the body as well as eyebrows or eyelashes.
- Can progress to the total scalp hair loss known as alopecia totalis. Or complete body hair loss.
- Can begin in childhood
- Is highly unpredictable
- The immune system attacks the hair follicles.
- Occurs in males or females of all ages and races.
- Scalp shows no signs of inflammation.
- No known cause or cure

Androgenic Alopecia

- A combination of heredity, hormones and age causes progressive shrinking or minaturation of terminal hair, converting it to vellus hair. Known as male pattern baldness in men.
- The active growth phase (anogen) becomes shorter; the resting phase (telogen) becomes longer.
- Sudden hair loss may be caused from deficiencies in crash dieting, heredity, oral contraceptives, medications and such conditions as cardiovascular conditions, vitamin deficiencies and thyroid disorders.
- Do not diagnose your client's hair loss condition; it is best to advise them to see a physician.

Postpartum Alopecia

- Temporary hair loss after having a baby is defined as postpartum alopecia.
- During pregnancy the hair stays longer in the anagen cycle. After childbirth the hair enters the telogen phase.
- Hormonal imbalance can cause the body to react in a strange way until it returns to the normal function.
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Telogen Effluvium

- Premature shedding of hair in the resting phase (telogen) can result from various causes such as childbirth, shock, drug intake, and fever.
- Birth control pills can also cause this type of hair loss.

Traumatic Alopecia

- Hair loss due to trauma to the hair shaft, such as pulling out elastics roughly, wearing ponytails, permanent waving rods placed too tightly, damage from brushing or combing the hair and chemical overuse.

TREATMENT OF HAIR LOSS

- All products that state that they will cure hair loss must go through a stringent government approval.
- Surgical options for hair loss are available, hair transplants, hair plugs and scalp reductions are available. Only a licensed doctor or dermatologist can perform these surgical options.
- Another option is wigs, toupees or hairpieces. These can cover up the problem but can be very hot in the summer months.
- Cosmetic hair thickeners are available and can be beneficial; staining of pillowcases or clothing is the drawback to these. They only create an illusion but do not allow the hair to grow back.
- Dermatologists that specialize in hair loss can prescribe products that can stimulate hair growth if the papilla is not dead this treatment can work.

DISORDERS OF THE HAIR

Abraded hair (broken hair)

Caused from brushing, trauma to the hair such as excessive hair coloring or bleaching, over processed permanent waving or placing perm rods to tight.

Split Ends (fragilitis crinium)

Brittle hair also known as **Trichoptilosis**. The split ends start as a small crack in the cuticle and deepen into the cortex. The hair cuticle can split away from the cortex. The hair becomes very brittle and frizzy and sometimes breaks off. Protein products can help the hair mend but only if it is not too damaged.

Matting (Pilica polonica)

A mass of hair strands tangled together.

Nodules (Trichorrhexis nodosa)

Knotted hair caused from rubbing against a pillow, chemical over processing, genetic and mechanical misuse of curling irons or hair straighteners.

Canities

The grayness or whiteness of the hair. When the hair starts to turn gray.

Ringed hair

Similar to a German Sheppard; dog each hair is two colors, very rare in humans.

Hypertrichosis (superfluous or hirsuties)

An over abundance of hair growing on the body where lanugo or a fine hair should only grow.

Monilethrix (beaded hair)

The hair shaft has beads through the shaft; this is hereditary.

DISORDERS OF THE SCALP

Pityriasis capitis simplex (Dandruff)

Dry, flaky, small white scales that usually appear on the scalp and the hair. Can be caused by poor circulation, lack of nerve stimulation, improper diet or emotional or glandular disturbances.

Pityriasis steatoides (Oily dandruff)

Greasy, waxy dandruff, scales mixed with sebum causing them to stick to the scalp. Medical treatment is advised.

Psoriasis

Thick crusty patches of red irritated scalp with yellow on the top. Is not contagious and is caused from the nervous system.

Itch mite (Scabies)

Red and watery vesicles or pus-filled areas caused by an animal parasite. Very contagious, do not work on this client until after treatment has taken place.

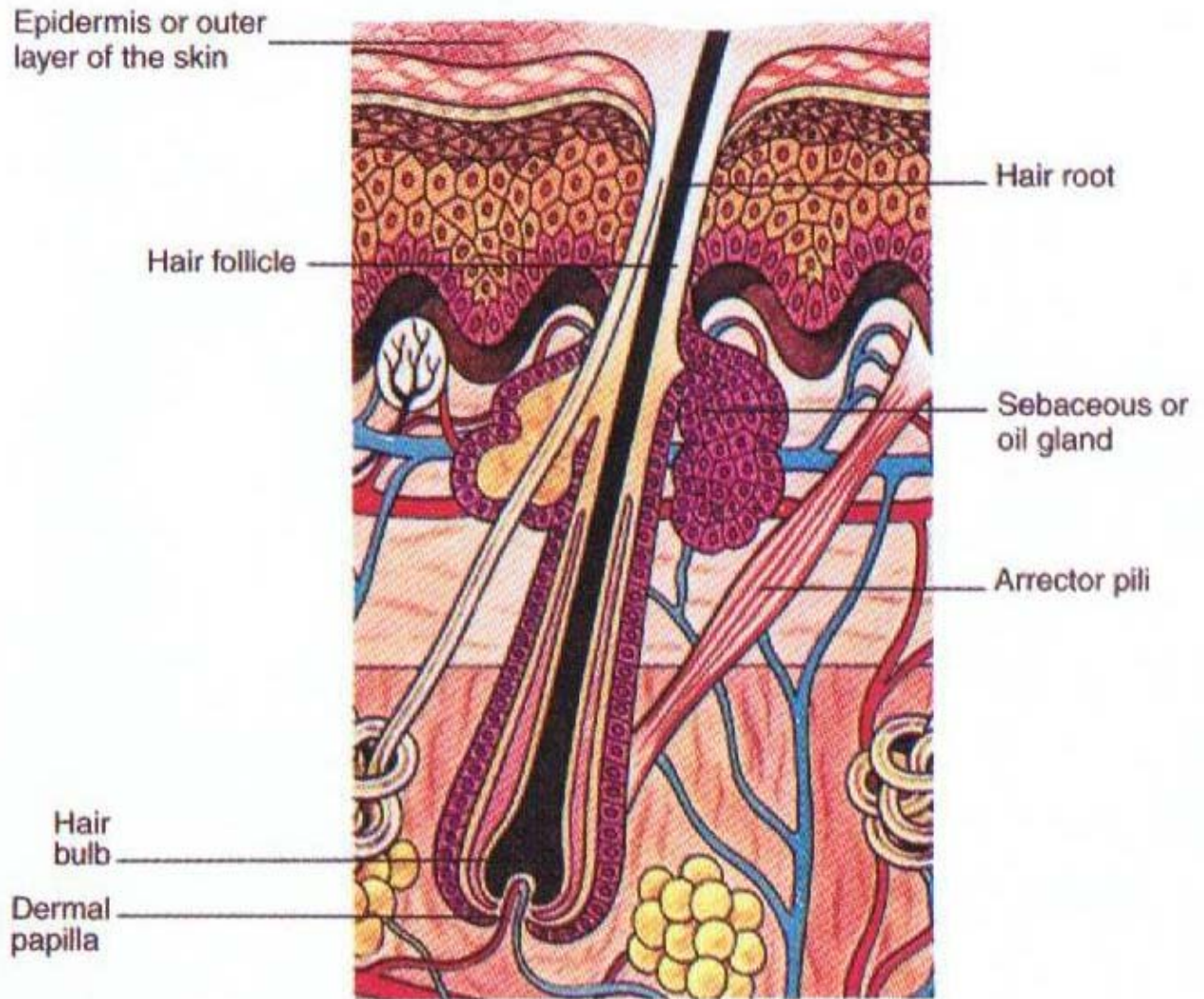
Head Lice (Pediculosis capitis)

An animal parasite that can move from person to person. They are very itchy and can multiply very quickly. Do not work on this client and refer them to a pharmacist.

Ringworm (Tinea)

Red circular patch of small blisters usually in the shape of a horseshoe; can be very contagious. Refer to a physician.

Use this diagram to identify parts of the hair root.



Assignment:

1. Go to a medical center near you and find brochures and information on scalp disorders, diseases and use this information in your salon.
2. Cut out a variety of pictures that have hair conditions or disorders and or research the Internet for help in recognizing each of the disorders. This will assist you in having a better understanding of the Trichology chapter when dealing with clients.
3. Have a doctor or health nurse come to the salon and do a class on the latest hair, skin and scalp disorders.