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Our records show that you need 24 CE hours to renew your license by October 1st
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24 HR HAIRCUTTING PRINCIPLES (201777)

This 24 HR. Package Booklet includes:

8 HRS. TRENDY AND CREATIVE CUTS :CE 20167 Page 2– 10

4 HRS. MAINTAINING HEALTHY SKIN :CE 20168Page 11— 21

12 HRS. COSMETOLOGIST COMPOSITION : CE 20169..... Page 21- 29

*Test Questions can be found on Page 30

*Course Participation and Test Answer sheet can be found at the bottom of page 31

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24 HRS HAIRCUTTING PRINCIPLES

Introduction

Haircutting is the single most important service you must master as a professional cosmetologist. Why? Because a good haircut serves as the foundation of most every other service offered in the salon. Compare it to building your dream home. You envision the finished product. You imagine the style you will use to furnish it. You then hire an architect (the stylist) to create the floor plan. Then you contract with a builder (the stylist) to construct the home. Now, if the builder establishes a weak foundation made of sand or clay, the home will not stand. A solid foundation, however, like the haircut, will serve as the sound base for the beautifully created home (or hairstyle)!

In addition, every member of the family avails themselves to regular haircuts. Therefore, it is a tremendous source of revenue and repeat business. You will begin with the basics in haircutting. You will need to learn the purpose and safe use of each haircutting implement. There are some basics in the anatomy of the head that will impact your skills in haircutting as well. Also, a review of some of the basic elements of design, including form, balance, and wave pattern, will be beneficial as you design a haircut.

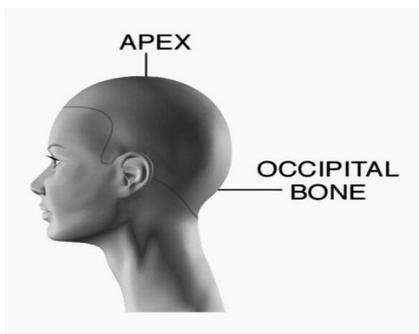
If a quality, well-blended haircut is not achieved, you will have difficulty in completing other services such as styling or chemical texture services. So it will serve you well to master your haircutting skills before entering the salon.

As with any other service, the client's desires, personality and lifestyle will all impact the techniques used and the end result of the haircut.

PRINCIPLES OF HAIR DESIGN

You need to develop an understanding of the important steps of the haircutting process. Those principles include sectioning, combing, elevating the hair, and cutting the hair ends which all essentially represent the physics (for every action or technique used, there will be an expected and predictable result) of hair.

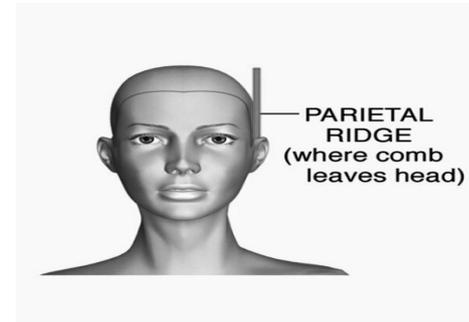
ANATOMY OF THE SKULL



Reference Points

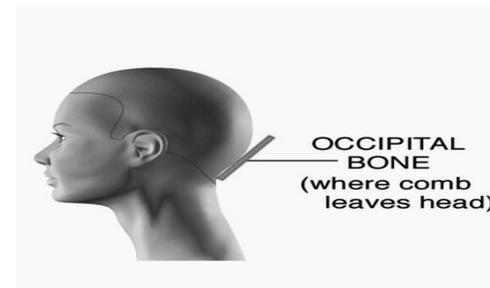
Understanding the reference points will help ensure balance within the design; allow you to re-create the haircut again and again; allow you to know where and when to change technique to make up for irregularities, such as a flat crown.

Parietal Ridge

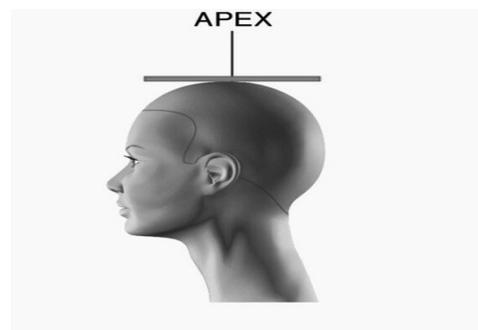


The Parietal Ridge is the widest area of the head, starting at the temples and ending at the bottom of the crown. It is found by placing a comb flat on the head at the sides. Where the head starts to curve away from the comb is the parietal ridge. This area is also referred to as the crest area.

Occipital Bone



The Occipital Bone protrudes at the base of the skull. This area is found by feeling the skull or placing a comb flat against the nape area to observe where the comb leaves the head.



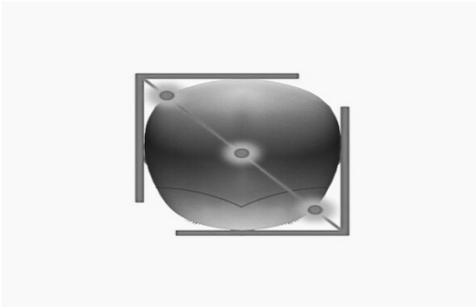
Apex

The Apex is the highest point on the top of the head. It is located by placing a comb flat on the top of the head. It will rest on that highest point.

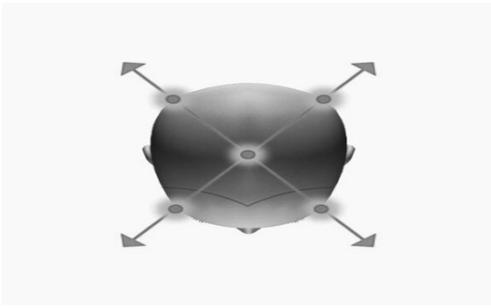
Four Corners

This area can be located in two ways.

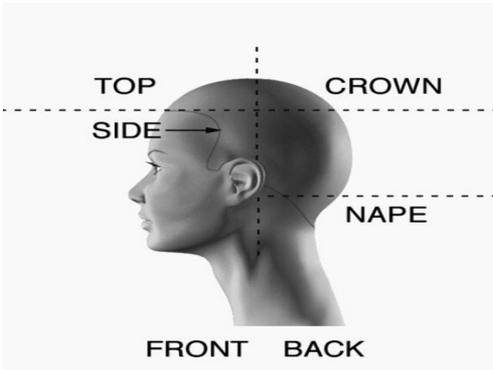
(1) Place two combs flat against side and back, locating the back corner at the point where the two combs meet.



(2) Make two diagonal lines crossing the apex of the head, pointing directly to the front and back corners.



Areas of the Head



Top- Locate the top by parting the hair at the parietal ridge, continuing all the way around the head. The hair in the top area lies on the head while hair everywhere else hangs due to gravitational pull.

Front- Locate the front by parting from the apex to the back of the ear. The hair that falls in front of the ear is considered to be the front (some side hair will be included here).

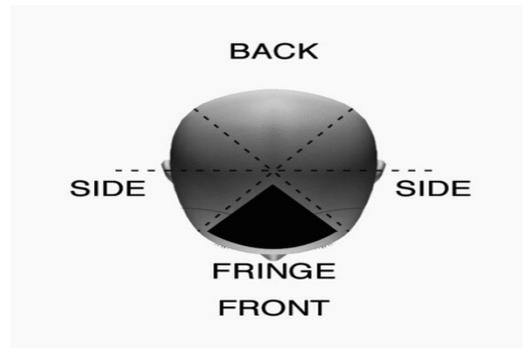
Sides- The sides include all the hair from the back of the ear forward, and below the parietal ridge.

Crown- The crown is the area between the apex and the back of the parietal ridge.

Nape- The nape is the area at the back of the neck and below the occipital bone. This area can be located by taking horizontal parting across the back of the head at occipital bone.

Back- This area is located by parting from the apex to the back of the ear. The hair that falls naturally behind the ear (located at the same time you locate the front section).

Fringe- This is also called the bang area. It is a triangular section that begins at the apex and ends at the front corners. This area can be located by placing a comb on top of the head so that the middle of the comb is balanced on the apex.



The spot at which the comb leaves the head in front of the apex is where the fringe begins. When combed into a natural falling position, it falls no farther than the outer corners of eyes.

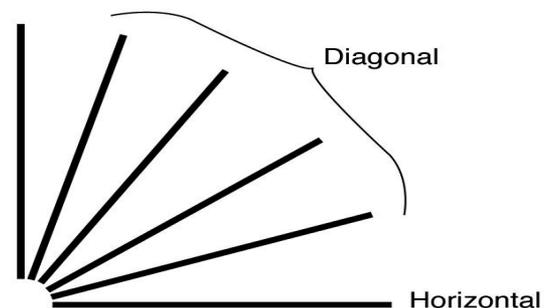
LINES AND ANGLES

A **Line** is a thin, continuous mark used as a guide.

An **Angle** is the space between lines or surfaces that intersect at a given point.

Straight Lines can be broken down into three types:

Vertical



Horizontal lines are parallel to horizon or floor. They are level and opposite of vertical. They direct the eye from one side to the other. Horizontal lines are used in one-length and low-elevation haircuts. They build weight. Consider the following:



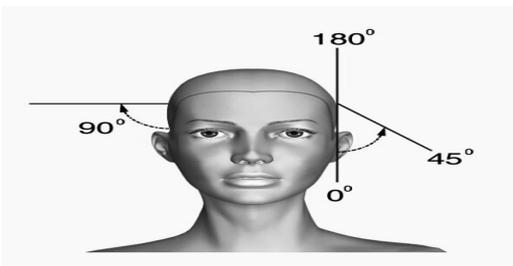
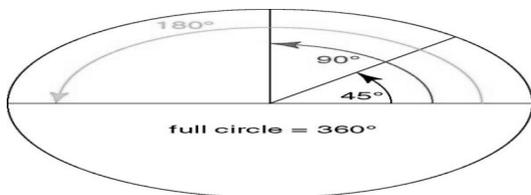
Vertical Lines are up and down rather than left and right. They are perpendicular to the floor. These types of lines are used to create graduated or layered haircuts and used with higher elevations. They remove weight. Consider the following example:



Diagonal Lines are between horizontal and vertical lines. They have a slanting or sloping direction. They are used to create beveling (a technique for creating fullness by cutting the ends at a slight taper). Diagonal lines are used to create stacking and to blend long layers to short layers as the following demonstration shows:



Angles- Basic geometry is important to haircutting because this is how shapes are created. Angles are important in elevation and cutting line



ELEVATION

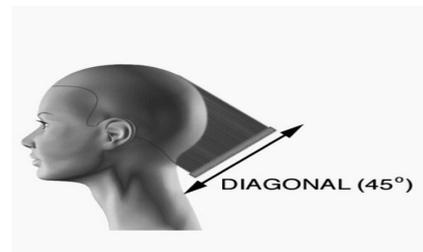
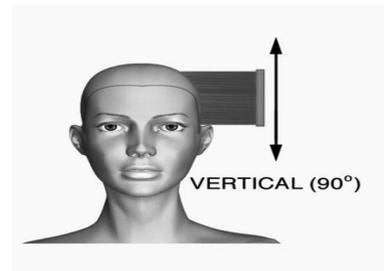
Elevation represents the angle or degree at which a subsection of hair is held, or elevated, from the head when cutting. It creates graduation and layers and is usually described in degrees. The more you elevate the hair, the more graduation you create.

Elevation below 90 degrees builds weight.

Elevation above 90 degrees removes weight or layers the hair.

CUTTING LINE

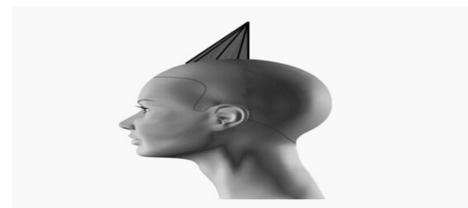
This is the **ANGLE** at which the fingers are held when cutting the actual line of hair that is cut. It's also called *finger angle*, *finger position*, *cutting position*, *cutting angle*, and *shears angle*.



GUIDELINES

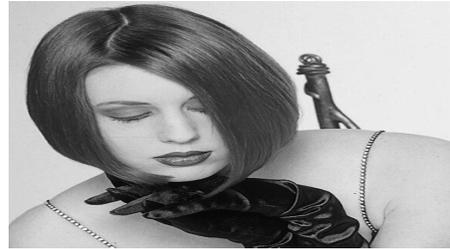
Also called a *guide*, this is the section of hair that determines the length the hair will be cut. It is located at either the perimeter (outer line) or the interior of the cut. It is usually the first section cut.

Stationary Guide- This guide does not move.



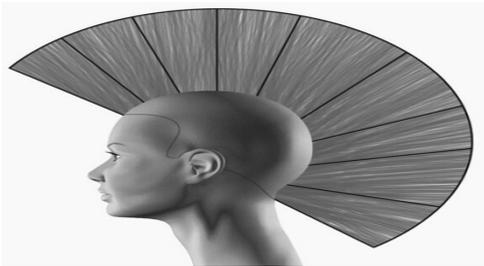
All other sections for the stationary guide are combed to this guide and cut at the same angle or length. A blunt cut is an example:

ELEVATION EXAMPLES:

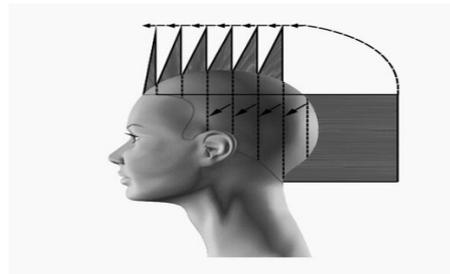


Blunt/One-Length Cut

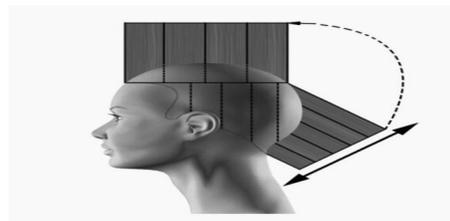
Traveling Guide- Also called a movable guide, this guide moves as the haircut progresses.



When using this type of guide, you take a small slice of the previously cut section and move it to the next subsection where it becomes the new guide. This guide is used often in layered and graduated haircuts.



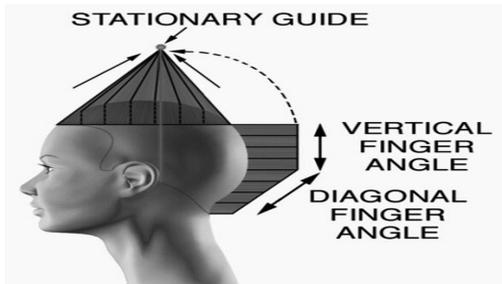
90-Degree Elevation



45-Degree with 90-Degree

OVER DIRECTION

OVER DIRECTION occurs when hair is combed away from its natural falling position, rather than straight out from the head, toward a guide. It's used in graduated and layered haircuts.



Client Consultant

A great haircut always begins with a great consultation. Often, when clients come to you, they are feeling that there is a lot at stake. They may be preparing for an important event, such as a party, a business event, or a wedding. They may be in the market for a new look, or wanting to change their appearance and, by extension, how they feel about themselves. Always perform a complete consultation on the client before beginning the haircut to ensure that both of you are in accord and that the haircut is suitable.

A consultation is a detailed conversation between you and your client during which you find out what the client is looking for, offer suggestions and professional advice, and come to a decision, about the most suitable haircut. The purpose of the consultation is to open the lines of communication, have a clear understanding of what the client wants, ensure that the client understands what you would like to do, and together determine the end result. Together you may share thoughts about the best haircut for the client's face shape and can discuss the nature of the client's hair whether it is thick or thin, fine or coarse, or straight or curly. If the client has a particular look in mind, the two of you can discuss whether that look will be appropriate.

It can be difficult when a client asked for something that you know will not look best for that person. This is when you will want to draw a line on skills such as gentle persuasion and positive reinforcement. A true professional can offer alternative suggestions that will work with the client's hair texture, face shape, and lifestyle. It is within the framework of the consultation that you will target those skills that led you into this people-oriented profession in the first place.

The Desired Look

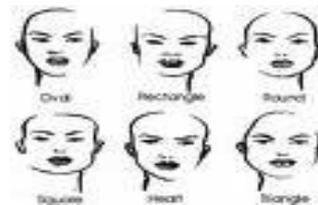
A great place to start with the consultation is to ask the client what she wants. Sometimes, she may not be able to answer that question and may ask you for some suggestions. Either way, this is the first step in the consultation.

There are several focal points to focus on here:

1. How much time is the client willing to spend on her hair every day?
2. What is her lifestyle?
3. Does she want something classic or trendy? For example, if a client with naturally curly thick hair is asking for a haircut that is primarily designed for straight hair, will she be willing to take the time to blow-dry it straight every day?

This is also the time you will want to analyze the hair density and texture, growth patterns, and hairline. If the client has hair that grows straight up in the nape and is requesting a short haircut that is soft and wispy at the hairline, you know the hairline will not lie down, so you may need to suggest other alternatives that will work with that kind of hairline.

Face Shape



Another part of consultation is analyzing the face shape.

A great haircut is not only technically sound, but also it suits the client's face shape. To analyze the shape of a client's face, pull all the hair away with a clip, or wrap the hair in a towel. Look for the widest areas, the narrowest areas, and the balance of the features.

A quick way to analyze a face shape is to determine if it is predominantly wide or long. Look at the features that you want to bring out, and those you might want to de-emphasize.

Wide Face Hairstyle

By analyzing face shape, you can begin to make decisions about the most suitable haircut, or shape, for the client. An important thing to remember is that weight and volume draw attention to an area. For example, if a client has a wide face, a hairstyle with fuller sides makes the face appear wider, whereas a narrower shape will give length to the face. On the other hand, if the client has a narrow forehead, you can add visual width by increasing volume or weight in that area. In order to balance out face shapes or draw the eye away from certain areas, you need to add or remove weight or volume in other areas.



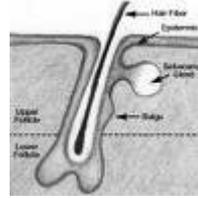
Narrow Face Hairstyle

Another important point to consider is the client's profile, or how she looks from the side. Turn the chair so you can see your client from the side in the mirror. Pull the hair away from the face and away from the neck. What do you see? Look for features to emphasize, such as a nice jaw line or lovely neck; or features to draw attention away from, such as a prominent or a receding chin, a double chin, or a prominent nose. The haircut you choose should flatter the client by emphasizing good features and taking attention away from features that are not as flattering. For example, if a client has a prominent chin, you will want to balance the shape by adding volume or weight somewhere else. If the client has a prominent nose, you can balance the shape from the profile by adding weight in an appropriate place.



Style for Client with Prominent Chin
Style for Client with Prominent Nose

Hair Analysis



There are five characteristics that determine the behavior of the hair

- Density
- Texture
- Wave pattern
- Hairlines
- Growth pattern

Hair Density

Hair density is the number of individual hair strands on one square inch of scalp. It is usually described as thin, medium, and thick. Hair density is different from hair texture in that different individuals with the same hair texture can have different densities. Some 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 small diameter), but high hair density (a high 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 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 Texture

Hair texture is the general quality and feel of the hair. It is based on thickness or diameter of each hair strand, usually classified as coarse, medium, and fine. A fine hair strand is much "skinnier" than that of a coarse hair strand. A client may, in fact, have a fine texture of hair with a thick density, meaning the individual hairs are fine, but there are a lot of them, or a client may have a coarse texture but a thin density, meaning the individual hairs are "fatter" but they are spaced further apart, or the client may have a coarse texture and a thick density, which translates into a substantial amount of hair.

Why is density and texture important? Different hair types respond differently to the kind of cutting they receive. Some hair types need more layers; some need more weight.

For example, coarse hair tends to stick out more, especially if cut to short, whereas fine hair can be cut to very short lengths and still lie flat.

However, if a client has fine (texture) and thin (density) hair, cutting too short can result in an unflattering look, with the scalp showing through.

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 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: front hairline, the temple, the crown, and the nape. 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.

Wave Pattern

The wave pattern, or the amount of movement in the hair strand, varies from client to client, as well as within the same head of hair. A client may have stick-straight hair (no wave), wavy hair, curly hair, extremely curly hair, or anything in between. Wave pattern is the result of genetics and racial background. Although there are exceptions, as a general rule, Asians tend to have extremely straight hair, Caucasians tend to have straight to wavy hair, and African Americans tend to have extremely curly hair. However, straight, curly, and extremely curly hair occurs in all races. This means that anyone of any race, or mixed race, can have hair with varying degrees of curliness from straight to extremely curly. It is also true that within races, individuals have hair with varying degrees of curliness.

The wave pattern may also vary from strand to strand on the same person's head. It is not uncommon for an individual to have different amounts of curl in different areas of the head. Individuals with curly hair often have straighter hair in the crown and curlier hair in other areas.

Several different theories seek to explain the cause of naturally curly hair, but there is no single, definite answer that explains why some hair grows straight and other hair grows curly.

The most popular theory claims that the shape of the hairs cross section determines the amount of curl. This theory stated that hair with a round cross-section is straight, hair with an oval cross-section is wavy, and hair with a flat cross-section is curly.

Although it is true that cross-sections of straight hair tend to be round and curlier hair tends to be more oval, modern microscopes have shown that a cross-section of hair can be almost any shape, including triangular. The shape of the cross-section does not always relate to the amount of curl.

Although it is still only a theory, it is now believed that natural curl is the result of one side of the hair strand growing faster than the other side. Since the side that grows faster is slightly longer than the slower growing side, tension within the strand causes the long side to curl around the shorter side. Hair that grows uniformly on both sides does not create tension and results in straight hair.

The hair's wave pattern is independent of its other properties. Hair has different diameters from fine to course, regardless of its wave pattern. All hair, straight to extremely curly and everything in between comes in different texture and densities.

Imagine the same haircut cut at the same length on different types of hair; fine thin hair, thick coarse hair, and medium curly hair.

Hairlines and Growth Patterns

Both the hairline and the growth patterns are important to examine. The hairline is the hair that grows at the outermost perimeter along the face, around the ears, and on the neck. The growth pattern is the direction in which the hair grows from the scalp, also referred to as natural falls or natural falling position. Cowlicks, whorls, and other growth patterns affect where the hair ends up once it is dry. You may need to use less tension when cutting these areas to compensate for hair being pushed up when it dries, especially in the nape, or to avoid getting a "hole" around the ear in the one-length haircut. Another crucial area is the crown (on many people there are some wild things going on up there!)



Uniform layered cut on fine, thin hair.



Uniform layered cut on thick, coarse hair.



Uniform layered cut on medium, curly hair.

Posture and Body Position

Posture, which is how you stand, and body position, which is how you hold your body when cutting hair, are important habits to be aware of. As a working cosmetologist, you will be spending many hours on your feet. Good posture and body position will help you avoid back problems in the future and ensure better haircutting results. The correct body position will help you move more efficiently through the haircut and thereby maintain more control over the process.

- Position the client. Not only is your body position important, but your client's is also. Make sure your client is sitting up straight and that her legs are not crossed. Gentle reminders as the haircutting progresses may be necessary. Remember, you can move the client by turning the chair, which give you the option to either keep your body in the same place or angle the client's chair so you can see what you are doing in the mirror.
- Center your weight. When working, keep your body weight centered and firm. Stand with your knees slightly bent, rather than locked. Instead of bending at the waist, bend one knee if you need to lean slightly one way or the other.
- Stand in front of your section. When cutting hair, a general rule of thumb is to stand directly in front of the area you are cutting. By doing this, you keep your body weight centered, and you will automatically find yourself moving around the head during the haircutting service. If you wish to stay standing in the same place, or want to be able to view what you are doing in the mirror, you may choose to move the chair.

Hand Positions for Different Cutting Angles

As a rule, always stand in front of the area you are working on, and position your hands according to the cutting line.

- Cutting over your fingers. There are some situations in which you will be cutting over your fingers or on top of your knuckles. This hand position is used most often when cutting uniform or increasing layers. In this case, you will usually stand to the side of the section on which you are working.
- Cutting below the fingers. When cutting a one-length bob or a heavier graduated haircut, it is customary to use a horizontal cutting line. In this case, you will be cutting below your fingers, or on the inside of your knuckles.
- Cutting palm to palm. When cutting with a vertical or diagonal cutting line, cutting palm to palm is the best way to maintain control of the subsection, especially with regard to elevation and over direction. Cutting palm to palm means that the palms of both hands are facing each other while cutting. This is different from cutting on the top of your fingers or knuckles. Cutting palm to palm also helps to prevent strain on your back as you work.

General Haircutting Tips

- Always take consistent and clean partings, which ensure an even amount of hair in each subsection and produce results that are more precise.
- Take extra care when working in the crown and neckline, which sometimes have very strong growth patterns.
- Another danger zone is the hair that grows around the ear or hangs over the ear in a finished haircut. Allow for the protrusion of the ear by either keeping more weight in that area of cutting with minimal tension.
- Always use consistent tension. Tension may range from maximum to minimum. You can maintain light tension by using the wide teeth of the comb and by not "pulling" the subsection too tightly. Whatever tension you are using, it should be consistent with in the area on which you are working.
- Pay attention to head position. If the head is not upright, it can be hard to judge elevation and over-direction.
- Maintain an even amount of moisture in the hair. Dry hair responds to cutting differently than wet hair, and may give you uneven results in the finished haircut.

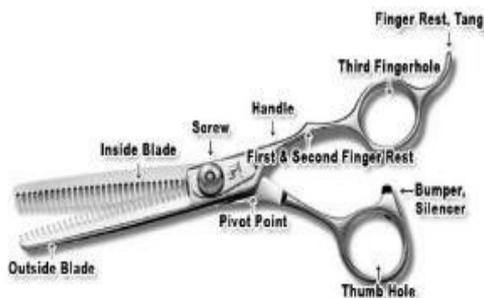
- Always work with your guideline. If you cannot see the guide your subsection is too thick. Go back and take a smaller subsection before cutting. Taking too large a subsection can result in a large mistake. By using smaller sections, if a mistake is made, it is small and therefore easier to correct.
- Always crosscheck the haircut; Crosscheck is parting the haircut in the opposite way, from which you cut it, to check for precision of line and shape. For example, if you use vertical partings in a haircut, crosscheck the lengths with horizontal partings.
- Use the mirror to see your elevation. You can also turn the client sideways so that you can see one side in the mirror while working on the opposite side. This helps create even line and maintains visual balance while working.
- Always check that both sides are even by standing in front of your client as well.

Remember that curly hair shrinks more than straight hair, anywhere from ½ to 2 inches. Always leave the length longer than the desired end result.

Haircutting Tools

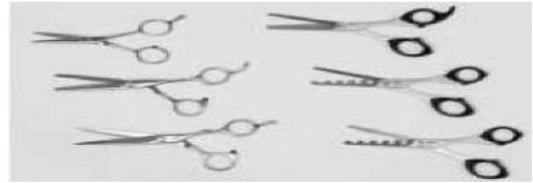
There are several tools that are indispensable for haircutting. Understanding these different implements or tool and the different results you can get is vital to creating a great haircut. To do your best work, buy and use only superior implements from a reliable manufacturer. Use them properly, and take good care of them.

- **Haircutting shears**- mainly used to cut blunt or straight lines in the hair. May also be used to slide cut, point cut and for other texturizing techniques.



- **Thinning shears** mainly used to remove bulk from the hair. Sometimes referred to as texturizing shears, tapering shears or notching shears. Many different types of thinning shears are used today, with varying amount of teeth in the blades. A general rule of thumb is that the more teeth there are the less hair is removed.

Notching shears are usually designed to remove more hair, with larger teeth set farther apart.



- **Straight razor or razor shaper**- mainly used when a softer effect is desired on the ends of the hair. Razors can be used to create an entire haircut, to thin hair out, or to texturize the hair in certain areas. Razors come in different shapes and sizes, with or without guards.



- **Clippers**- mainly used when creating short tapers, short haircut, fades and flat tops. Use cutting guards at various length or in the clipper-over comb technique. Clippers can be used without a guard to shave hair right to the scalp.



- **Edgers**- a smaller version of clippers mainly used to remove excess or unwanted hair at the neckline and around the ears, mostly on haircuts for men and very short haircuts for women.
- **Wide tooth comb**- mainly used to detangle hair. Rarely used when performing a haircut.
- **Section clips**- these come in a variety of shapes styles and sizes and can be made of plastic or metal. In general two types are used jaw clip and duckbill clips. Both come in large and small sizes.
- **Barber Comb**- Mainly used for close tapers in the nape and sides when using the shears over comb technique. The narrow end of the comb allows the shears to get very close to the head.
- **Styling or cutting comb**- also referred to as all-purpose comb, used for most haircutting procedures. It can be 6 to 8 inches in length and has fine teeth at one end, wider at the other.

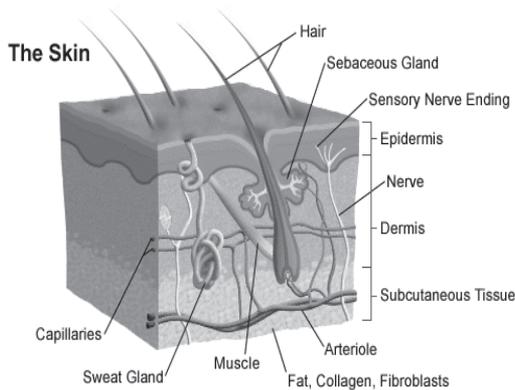
4-Hours Maintaining Healthy Skin

II. Course Description

Upon completion this course you will have a thorough knowledge of the anatomy of healthy skin care. You will learn about important facts for defining healthy skin care. General skin care routines are discussed which include the use of masks, cleansing techniques, toning, moisturizing, and sun protection. This course will also outline the five categories of skin types.

With emphasis on skin care awareness in the salon, common skin disorders will be covered which will help the cosmetologist and esthetician to identify lesions of the skin. This course will be summed up with important information about sun exposure protection and the ABCDEs of Melanoma. In summary, flash facts about histology of the skin will be demonstrated with pictorial examples.

III. Anatomy of the Skin



A. Facts about the skin:

The skin is the body's largest organ, covering the entire body. In addition to serving as a protective shield against heat, light, injury, and infection, the skin also:

- Regulates body temperature.
- Stores water and fat.
- Is a sensory organ.
- Prevents water loss.
- Prevents entry of bacteria.

Throughout the body, the skin's characteristics vary (i.e., thickness, color, texture). For instance, the head contains more hair follicles than anywhere else, while the soles of the feet contain none. In addition, the soles of the feet and the palms of the hands are much thicker.

The skin is made up of the following layers, with each layer performing specific functions:

- Epidermis
- Dermis
- Subcutaneous fat layer (subcutis)

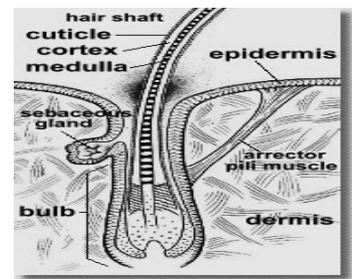
IV. What is healthy skin?



Your skin is much more than an outer surface for the world to see. It protects you from bacteria, dirt and other foreign objects and the ultraviolet rays of the sun, and contains the nerve endings that let you know if something is hot or cold, soft or hard, sharp or dull. Your skin also plays an important role in regulating your body's fluids and - temperature.

Skin covering the average human body ranges between 1.7 and 2 square meters (~20 square feet) in length and weights about 6 pounds (2.7 kg). With so much skin to care about, lots of people ignore even the basic needs of a healthy skin. You really should pay more attention to it, knowing that the skin is actually one of the most powerful indicators of the overall health. It also eliminates toxins through perspiration via pores which is vital, not to mention the appearance and visual impact it has to people we interact with.

Below the smooth, hairy outer skin, or epidermis, that we see every day is a thick, strong and elastic layer of tissue known as the dermis. The dermis is richly supplied with blood vessels, sweat and oil glands, and nerve endings.



Healthy skin is smooth, with no breaks in the surface. It is warm (not hot or red) and neither dry and flaky nor moist and wrinkled. Healthy skin is a mirror of a healthy body. Healthy skin is well hydrated skin.

V. General Skin Care Routines

A. Cleansing



Cleansing is the first essential step to any daily skin care routine. Cleansing the face at least twice a day is suitable for normal skin. If skin is oily, a more frequent cleansing or about four to five times a day is required. However, products that are water-based and gentle are ideal so as to not over-dry the skin. For dry skin, it is best to avoid frequent washing and a suitable oil-based cosmetic cleanser instead of soap is preferred. There are several alternatives to soap and water cleansing. Cleansers can be in the form of creams, milks, lotions, gels and liquids. All are a mixture of oil, wax and water which have been formulated to suit different skin types. A cotton -pad dipped in fresh milk available at home, is an equally effective natural cleanser. To complete the cleansing process, the skin must be rinsed with water. Some who wear long wearing foundation may find it beneficial to pre-cleanse the face with a cleansing oil to remove any silicones left over from the foundation.

B. Masks



Essentially all face masks have some sort of a cleansing action. Various ingredients are used in the masks, depending on the skin type. Clay forms an important constituent of many face masks that helps to remove dirt, sebum, and dead skin to refresh and soften the skin surface. Fullers' earth is a special type of clay often used in face packs. It contains aluminum silicate and as it dries on the skin, it absorbs the superficial dead cells and blots up any excessive oil. It is therefore excellent for oily skin but should not be used on dry skin. Kaolin is also fine clay which removes grime, oils and dead cells.

Again it is best for oily skin and should be avoided on dry skin. Another ingredient of some of the masks is a peeling or exfoliating agent which helps remove the top layer of dead cells from the skin, leaving behind fresh youthful skin.

Oatmeal and bran are the commonly used peelers. In addition, natural ingredients such as cucumbers, curds, lemon juice and Brewer's Yeast are added to many masks to restore the acid / alkali balance of the skin. There are three general forms that masks come in: Clay, Peel, and Sheet. The clay formulation is one of the most common. It is usually composed of different clays to draw out the impurities in the skin. Peel masks usually have a gel like consistency and are peeled off of the skin to help exfoliate. Sheet masks are becoming more common in America; they are very popular in Asia. Sheet masks can be used to treat different skin concerns, but one of the most popular concerns is skin brightening.

C. Toning

Many skin care products include skin fresheners, toners and astringents which generally contain alcohol and water. These products are used after cleansing the skin to freshen and tone up and remove any traces of dirt or impurities from the skin, as well as restore the skin's acid/alkali balance. Non-alcoholic fresheners are for dry and sensitive skin. Those with alcohol (astringent) are for oily skin. When servicing clients with combination skin, you should use both kinds for the different areas of their face.

D. Moisturizing



Regular use of a suitable moisturizer benefits the skin as it not only replaces water lost from the skin but also prevents the loss of water. It protects the skin against the drying influences of the environment including the harsh effects of the sun, cold and heat. Tinted moisturizers can be used under foundation cosmetics. It allows make-up to remain moist. Using a moisturizer is particularly beneficial for dry skins. Oil free moisturizers are also available for oily skins. There are two types of moisturizers: Oil - in water emulsions and water -in -oil emulsions. For normal and combination skin, a water based moisturizer containing minimal oil is suitable. Sensitive and dry types of skin need moisturizers containing a high content of oil.

E. Protecting

The sun is the most damaging environmental factor to the health and appearance of skin. Ultraviolet radiation from sunlight can cause permanent damage to the skin causing it to sag, lose elasticity and form wrinkles. Severe sunburn can even cause skin cancer. Therefore, sunscreen and SPF-foundations protect the skin against these damaging effects.

They also shield the skin from direct contact with dirt or pollutants in the air and help the skin retain necessary moisture. Sunscreen's come in lotions and creams. A sunscreen with the sun protection factor (SPF) of number 15 can block most of the sun's ultraviolet radiations before it can damage the skin. The SPF number indicates the length of time that the product will protect the skin, i.e. 15 hours.

Sunscreens should be applied at least 10 minutes before exposure to the sun to ensure proper absorption and effective protection.

VI. Skin Types

There are five basic skin types, including:

A. Normal Skin

This type of skin has a fine, even and smooth surface due to having an ideal balance between oil and moisture contents and is therefore neither greasy nor dry. People who have normal skin have small, barely-visible pores. Thus, their skin appears clear and does not develop spots and blemishes. This type of skin needs minimal and gentle treatment.

B. Dry Skin

Dry skin has a parched appearance and tends to flake easily. It is prone to wrinkles and lines due to the inability to retain moisture, as well as, the inadequate production of sebum by sebaceous glands. Dry skin often has problems in cold weather as it dries up even further. Constant protection in the form of a moisturizer by day and a moisture-rich cream by night is essential.

C. Oily Skin

As its name implies, this type of skin's surface is slightly to moderately greasy, which is caused by the over secretion of sebum. The excess oil on the surface of the skin draws dirt and dust from the environment to stick to it. Oily skin is usually prone to black heads, white heads, spots and pimples. It needs to be cleansed thoroughly every day.

D. Combination Skin

This is the most common type of skin. As the name suggests, it is a combination of both oily and dry skin where certain areas of the face are oily and the rest dry. The oily parts are usually found on a central panel, called T – Zone, consisting of the forehead, nose and chin. The dry areas consist of the cheeks and the areas around the eyes and mouth. In such cases, each part of the face should be treated accordingly where the dry areas are treated as for dry skin and the central panel is treated as for oily skin. There are also skin care products made especially for those who have combination skin.

E. Sensitive skin

Sensitive skin has a very fine texture and is excessively sensitive to changes in the climate. This skin type is easily irritated, bruised and/or scarred from bleaching, waxing, threading, perfumes, temperature extremes, soap, shaving creams, etc.

People who belong to this skin type should avoid products with dyes, perfumes, or unnecessary chemical ingredients that may aggravate the skin.

VII. Common Skin Disorders

A. Acne



What is acne?

Acne is a disorder of the hair follicles and sebaceous glands. With acne, the sebaceous glands are clogged, which leads to pimples and cysts.

Acne is very common - nearly 80 percent of individuals in the US between 11 and 30 years old will be affected by this condition at some point. Acne most often begins in puberty. During puberty, the male sex hormones (androgens) increase in both boys and girls, causing the sebaceous glands to become more active - resulting in increased production of sebum.

How does acne develop?

The sebaceous glands produce oil (sebum) which normally travels via hair follicles to the skin surface. However, skin cells can plug the follicles, blocking the oil coming from the sebaceous glands. When follicles become plugged, skin bacteria (called *Propionibacterium acnes* or *P. acnes*) begin to grow inside the follicles, causing inflammation.

Acne progresses in the following manner:

1. Incomplete blockage of the hair follicle results in blackheads (a semisolid, black plug).
2. Complete blockage of the hair follicle results in whiteheads (a semisolid, white plug).
3. Infection and irritation cause whiteheads to form.

Eventually, the plugged follicle bursts, spilling oil, skin cells, and the bacteria onto the skin surface. In turn, the skin becomes irritated and pimples or lesions begin to develop. The basic acne lesion is called a comedo.

Acne can be superficial (pimples without abscesses) or deep (when the inflamed pimples push down into the skin, causing pus-filled cysts that rupture and result in larger abscesses).

What causes acne?

Rising hormone levels during puberty may cause acne. In addition, acne is often inherited. Other causes of acne may include the following:

- Hormone level changes during the menstrual cycle in women
- Certain drugs (such as corticosteroids, lithium, and barbiturates)
- Oil and grease from the scalp, mineral or cooking oil, and certain cosmetics may worsen acne
- Bacteria inside pimples

Acne can be aggravated by squeezing the pimples or by scrubbing the skin too hard.

What are the symptoms of acne?

Acne can occur anywhere on the body. However, acne most often appears in areas where there is a high concentration of sebaceous glands, including the following:

- Face
- Chest
- Upper back
- Shoulders
- Neck

The following are the most common symptoms of acne. However, each child may experience symptoms differently. Symptoms may include:

- Blackheads
- Whiteheads
- Pus-filled lesions that may be painful
- Nodules (solid, raised bumps)

B. Dry Skin



What is dry skin?

Dry skin is a very common skin condition, usually characterized by irritated skin and itchiness. Dry skin often worsens in the winter, when the air is cold and dry. In addition, frequent bathing can aggravate dry skin. With no treatment, dry skin may become flaky or scaly.

It is important to note, however, that dry skin symptoms may resemble other skin conditions, or result from other disorders such as an under-active thyroid or acquired immune deficiency syndrome (AIDS). Always consult your physician for a diagnosis.

Treatment for dry skin:

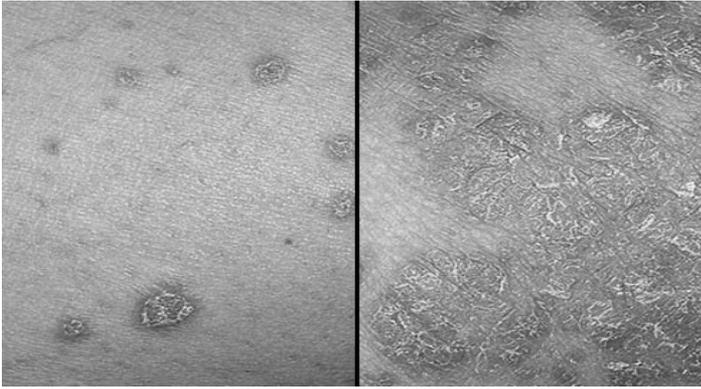
Treating dry skin may be as simple as keeping the skin moist by taking fewer baths and using ointments or creams that keep the moisture in. Treatment may also include:

- Avoiding harsh soaps, detergents, and perfumes, which tend to dry the skin
- Avoiding rubbing or scratching the skin, which can aggravate the symptoms and cause infection
- Applying a salicylic acid solution or cream (which removes the top layer of skin) if the skin is scaly

Call your doctor if:

- There is itching without a visible rash.
- The itching and dryness are so bad you can't sleep.
- You have scratched so hard that you have open cuts or sores.
- Home remedies have not relieved the dryness and itching.

C. Psoriasis



Guttate psoriasis

This type of psoriasis affects mostly children. Symptoms may include many small patches of red, raised skin. A sore throat usually precedes the onset of this type of psoriasis.

Pustular psoriasis

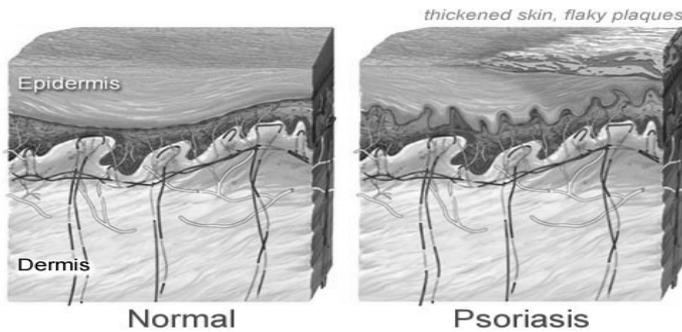
Symptoms may include small pustules (pus-containing blisters) all over the body or just on the palms, soles, and other small areas.

The symptoms of psoriasis may resemble other skin conditions. Always consult your physician for a diagnosis.

What is psoriasis?

Psoriasis is a chronic skin condition characterized by inflamed, red, raised areas that often develop as silvery scales on the scalp, elbows, knees, and lower back. Psoriasis is estimated to affect 7.5 million people in the US.

What causes psoriasis?



The exact cause of psoriasis is unknown, but experts believe that the immune system, genes, and environmental factors play central roles. Normally, old skin cells are replaced with new ones every four weeks. In people with psoriasis, the immune system triggers inflammation, causing new cells to move to the surface every three or four days. The resulting buildup forms the rash. Psoriasis cannot be passed from person to person, but it does tend to run in families.

What are the symptoms of psoriasis?

The following are the most common symptoms of psoriasis. However, each individual may experience symptoms differently, as psoriasis comes in several forms and severities. Symptoms may include:

Discoid psoriasis

Also called plaque psoriasis, this type of psoriasis is the most common. Symptoms may include patches of red, raised skin on the trunk, arms, legs, knees, elbows, genitals, and scalp. Nails may also thicken, become pitted, and separate from the nail beds.

How is psoriasis diagnosed?

When the condition progresses to the development of silvery scales, the physician can usually diagnose psoriasis with a medical examination of the nails and skin. Confirmation of diagnosis may be done with a skin biopsy (taking a small skin specimen to examine under a microscope).

Treatment for psoriasis

Specific treatment for psoriasis will be determined by your physician based on:

- Your age, overall health, and medical history
- Severity of the condition
- Your tolerance of specific medications, procedures, or therapies
- Expectations for the course of the condition
- Your opinion or preference

The goal of treatment is to reduce inflammation and slow down the rapid growth and shedding of skin cells. At the present time, there is no cure for psoriasis. Treatment may include:

- Ointments and creams (to moisturize the skin)
- Sunlight or ultraviolet light exposure (under a physician's supervision)
- Steroids (such as cortisone creams)
- Vitamin D cream
- Creams containing salicylic acid or coal tar

- Anthralin--a drug that treats the thicker, hard-to-treat patches of psoriasis.
- Methotrexate--an anti-cancer drug that interrupts the growth of skin cells.
- Oral or topical retinoids
- Immunosuppressive medications (such as Cyclosporine)

Outlook

There is no known way to prevent psoriasis. Although it is a life-long condition, it often can be controlled with appropriate treatment. Keeping the skin clean and moist, and avoiding person-specific psoriasis triggers (excessive stress, for example) may help decrease flare-ups.

D. Keratosis Pilaris



What is keratosis pilaris?

Keratosis pilaris is a common skin disorder characterized by small, pointed pimples. The pimples usually appear on the upper arms, thighs, and buttocks. The condition worsens in the winter and usually clears up in the summer. Keratosis pilaris has no known cause, but tends to run in families.

This disorder does not get worse over time. It is harmless, and often disappears as the person ages.

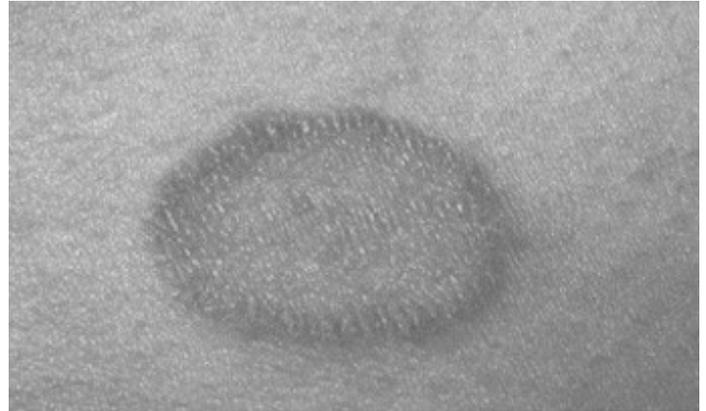
Treatment for keratosis pilaris:

Usually no treatment is necessary for keratosis pilaris, since it normally clears up by itself. Treatment may include:

- Using petroleum jelly with water, cold cream, or salicylic acid (which removes the top layer of skin) to flatten the pimples
- Using a tretinoin cream (a drug which is chemically related to vitamin A)

Contact your health care provider if the condition does not respond to over-the-counter moisturizing lotions. Since this is a common, harmless skin condition, you can also discuss it during a routine office visit.

E. Pityriasis Rosea



What is pityriasis rosea?

Pityriasis rosea is a mild, but common, skin condition. Characterized by scaly, pink, inflamed skin, the condition can last from four to eight weeks and usually leaves no lasting marks.

What causes pityriasis rosea?

The cause of pityriasis rosea is not known, but it is commonly believed to be caused by a virus. It is usually seen in children, adolescents, and young adults. Most people with the rash are 10 to 35 years of age.

The condition is more prevalent in spring and fall.

What are the symptoms of pityriasis rosea?

Pityriasis rosea usually starts with a pink or tan oval area (sometimes called a herald or mother patch) on the chest or back. The main patch is usually followed (after a couple of weeks) by smaller pink or tan patches elsewhere on the body--usually the back, neck, arms, and legs.

The following are other common symptoms of pityriasis rosea. However, each individual may experience symptoms differently. Symptoms may include:

- Fatigue
- Aches
- Itching

The symptoms of pityriasis rosea may resemble other skin conditions. Always consult your physician for a diagnosis.

How is pityriasis rosea diagnosed?

Pityriasis rosea is usually diagnosed based on a medical history and physical examination. The rash of pityriasis rosea is unique, and the diagnosis is usually made on the basis of a physical examination. In addition, your physician may order the following tests to help aid in the diagnosis:

- Blood tests
- Skin biopsy--the removal of some of the diseased skin for laboratory analysis. The sample of skin is removed after a local anesthetic is administered.

Treatment for pityriasis rosea

Specific treatment for pityriasis rosea will be determined by your physician based on:

- Your age, overall health, and medical history
- Extent of the rash
- Your tolerance for specific medications, procedures, or therapies
- Expectations for the course of the rash
- Your opinion or preference

The goal of treatment for pityriasis rosea is to relieve symptoms associated with the condition, such as itching. Treatment may include:

- Medicated lotions and creams (to soothe the itching)
- Medications by mouth (to ease the itching)
- Cool baths with or without oatmeal (to soothe the itching)
- Ultraviolet exposure (under a physician's supervision)
- Cool compresses (to soothe the affected skin)

There is no cure for pityriasis rosea. The condition will usually resolve on its own in about six to 12 weeks. Normally, it does not return.

F. Rosacea



What is rosacea?

Rosacea is a common skin condition that usually only affects the face and eyes. Characterized by redness, pimples, and broken blood vessels, rosacea tends to begin after middle age (between the ages of 30 and 60) and is more common in fair-skinned people.

The cause of rosacea is unknown. An estimated 14 million people in the US have rosacea.

What are the symptoms of rosacea?

Rosacea often begins with easy blushing and flushing of the facial skin. Eventually, redness will persist around the nose area, extending to the rest of the face. Rosacea has a variety of clinical symptoms and is classified into the following four types, based on these different symptoms:

G. Sebaceous Cysts



What are sebaceous cysts?

Sebaceous cysts are harmless, slow-growing bumps under the skin, often appearing on the scalp, face, ears, back, or groin area. The cysts usually contain dead skin and other skin particles.

Treatment for sebaceous cysts:

Warm moist compresses placed over the cysts may help them drain and heal. Sebaceous cysts can usually be treated by a physician by puncturing the top and removing its contents.

However, large cysts may reappear and may have to be surgically removed. If a cyst becomes swollen, tender, large, or infected, treatment may include administering antibiotics and then surgically removing the cyst.

VIII. Skin Disorder Awareness in the Salon



While the level of knowledge needed by scientists is not necessary for cosmetologists, a thorough knowledge of the underlying structures of the skin, nails, and hair will benefit you in your role. Such knowledge will help you achieve the best possible results when providing hair, skin, and nail care services while at the same time providing the utmost protection for your client.

Your training will help you to become familiar with common disorders and diseases of the skin and allow you to recognize those conditions that cannot be treated or serviced by a cosmetologist. Thoroughly analyzing the functions and components of the skin is the best way to understand how the skin works. With proper care, the skin can stay young and radiant-looking for many years.

This course contains extensive new terminology which will seem overwhelming at first. We will cover the material in detail and introduce several exercises and activities that can be used to help you retain the terminology and definitions.

The skin is the largest and one of the most important organs of the body. A healthy skin is slightly moist, soft, and flexible. It possesses a slightly acid reaction and is free from any disease or disorder. The ideal feel and appearance of skin is smooth and fine-grained. That feel and appearance is known as skin texture. Hairs, nails, sweat, and oil glands, which are all very important to the cosmetologist, are considered appendages of the skin. It is important to note that the skin on the eyelids is the thinnest of the entire body while the skin on the palms of the hand and soles of the feet is the thickest. Continued pressure on any part of the skin will result in calluses. The skin on the scalp has larger and deeper follicles to accommodate the longer hair found on the head.

Lesions of the Skin

- Skin lesions are abnormal changes in the structure of an organ or tissue.
- Lesions are divided into three categories:
 - Primary
 - Secondary
 - Tertiary

- Cosmetologists are only concerned with primary and secondary lesions.

Primary Skin Lesions

- **Macules:** discoloration appearing on the skin's surface
 - Freckles are an example of macules.
- **Lentiginos:** technical term for freckles
- **Papules:** hardened red elevations of the skin in which no fluid is present
 - A large papule is known as a tubercle.
 - A pimple is an example of a papule.
- **Vesicles:** fluid-filled elevations in the skin caused by localized accumulation of fluids or blood just below the epidermis.
- Macules and papules may cause vesicles.
- **Herpes Simplex:** also known as fever blister, is a contagious, chronic condition caused by a single vesicle or a group of vesicles on a red swollen base.
 - Appears on the lips, nostrils, or other parts of the face.
 - Services should not be performed when herpes simplex is present.
- **Bulla:** Lesion, and larger vesicles with a clean watery fluid
 - Located below the skin
 - Occur in second-degree burns.
- **Pustules:** Small elevations of skin; similar to vesicles, but contain pus
 - They are white or yellow in color and may be surrounded by a reddish inflamed border.
 - An example of a pustule is a pimple with pus.
- **Wheals:** Solid formation above the skin, sometimes caused by an insect bite or allergic reaction
 - May be accompanied with itching or tingling
 - An example of a wheal is hives or an insect bite.

- **Tumors:** Solid masses in the skin, which may be soft or hard
 - An example of a small tumor is a nodule.

Secondary Lesions

- A secondary skin lesion is the progressed stage of a disease.
- Needs to be treated by a dermatologist or a physician
- **Scales:** Dead cells of the uppermost layer of the epidermis that shed.
 - Psoriasis and dandruff are examples of scales
- **Psoriasis:** Round, dry patches of skin, covered with rough silvery scales.
 - It is chronic, but not contagious.
- **Crust:** Dried masses that come from the remains of an oozing sore.
 - An example: scab on a sore
- **Excoriations:** mechanical abrasions or injury to the epidermis
 - Occur when an insect bites or scab is scratched
 - An example of an excoriation is a scratch
- **Fissure:** Cracks in the skin
 - Cracks or lines that go deep into the underlying dermis
 - Occur when skin is exposed to wind, cold, or water and loses its flexibility
 - An example of a fissure is a chapped lip
- **Scars:** Forms from a lesion when injury extends deep into the dermis
- **Keloids:** Thick scars
- **Ulcers:** Open lesions that are visible on the surface of the skin
 - Services should not be performed when ulcers are present.

Pigmentation Abnormalities

- Pigmentation Abnormalities are conditions with little or too much color in certain areas of the skin.
- **Melanoderma:** Hyper-pigmentation caused by over activity of the melanocytes in the epidermis
 - Examples of melanoderma are chloasma and lentigines.
- **Chloasma:** Group of brownish macules usually on the hands and face
 - Also known as liver spots
- **Moles:** Small, brown pigmented spots that may be elevated.
 - Some contain hair, but should not be removed
 - A physician should be seen if there are any changes in the appearance of a mole.
 - Moles are the cause of some skin cancers.
- **Naevus:** Birth mark or a congenital mole
- **Leukoderma:** Hypo-pigmentation (lack of pigmentation) of the skin caused by a decrease in melanocytes.
- **Albinism:** Congenital failure of the skin to produce melanin pigment
 - A person with albinism has very fair skin, white hair, and pink eyes.
 - They are sensitive to light and sun.
- **Vitiligo:** Oval or odd shaped patches of white skin that do not have normal pigmentation.
 - Usually appear on the face, hands, and neck

Disorders of the Sebaceous Glands

- **Comedones:** Also known as blackheads; masses of sebum (oil) locked inside the hair follicle
- **Milia:** Also known as whiteheads; caused by accumulation of hardened sebum beneath the skin
- **Acne:** Chronic inflammatory disorder of the sebaceous glands
 - Acne occurs in two stages: acne simplex and acne vulgaris.
 - A person with acne vulgaris should seek a physician
- **Rosacea:** Also known as acne rosacea; a chronic inflammatory congestion of the cheeks and nose; papules and pustules are sometimes present.

- Services should not be performed when rosacea is present.
- **Asteatosis:** dry, scaly skin caused by low sebum production
- **Seborrhea:** Excessive secretion of the sebaceous glands.
- **Steatoma:** Also known as a sebaceous cyst or wen; subcutaneous tumor of the sebaceous glands, filled with sebum
- **Furuncles:** Also known as boil; appears in the dermis and the epidermis and are caused by acute staphylococcal infection.
 - Usually are hair follicle infections
- **Carbuncles:** Larger than furuncles; located above and below the skin are caused by acute staphylococcal infection of several adjoining hair follicles.

Disorders of the Sudoriferous Glands

- **Bromidrosis:** Foul-smelling perspiration
- **Anhidrosis:** Lack of perspiration; caused by fever or disease
- **Hyperhidrosis:** Over-production of perspiration; caused by excessive heat or body weakness
- **Miliaria Rubra:** Acute eruption of small red vesicles; caused by excessive heat
- Services should not be performed when Miliaria Rubra is present.

Keep the following facts in mind before performing a service on any client who may have a skin disorder:

Cosmetologists and estheticians are not dermatologist or physicians who diagnose and treat skin diseases and disorders. It is very important that you are able to recognize different skin conditions in order to protect yourself and your client.

However, coming in contact with skin every day should encourage you to be cautious when you find cases of severe skin disorders.

IX. THE SUN AND YOUR SKIN

A. Skin Damage

Overexposure to ultraviolet (UV) radiation from the sun can cause significant damage to your skin.

Wrinkles

- UVA rays from the sun can penetrate deep into your skin and damage collagen, which is the protein that holds your skin together in a firm and smooth way. Collagen and elastin

fibers weaken faster when skin is frequently exposed to ultraviolet (UV) rays without proper protection.

- UVA breaks down the collagen structure which results in wrinkles.
- UVB rays, also called burning rays; cause sunburn and tanning of the skin by affecting the melanocytes (cells of the epidermis that produce melanin). These rays are not as deep as UVA but are equally damaging to the skin and eyes. They do, however, contribute to the body's synthesis of vitamin D.
- Once collagen is damaged, it cannot re-build itself.
- Up to 80% of skin aging is caused by the sun.

Freckles/Sun Spots

- Freckles and sun spots are signs of skin damage and develop as a result of too much sun exposure.
- Freckles and sun spots are frequently found on face, legs and back of hands. Individuals who sunbathe regularly may develop freckles and sun spots all over their skin.

Sun Tan

- Contrary to popular belief, a tan is not "healthy." A tan is a sign that damage has been done to your skin.
- When exposed to the sun's UV rays, your skin's melanocytes produce melanin, the dark pigment that creates a tan. A tan is your skin's attempt to prevent UV rays from doing any further damage to the sensitive skin cells in your epidermis.
- A tan does not help protect your skin from getting sunburn in the future. A tan is equivalent to merely an SPF 4!

Sunburn

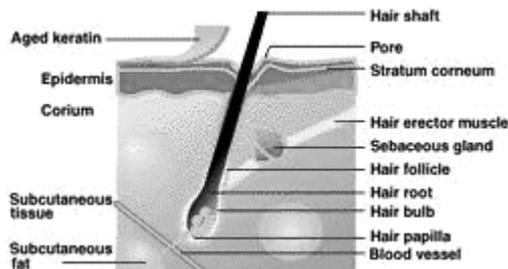
- Overexposure to the sun's UV rays results in a painful sunburn. UV rays penetrate deep into the layers of your skin and kill living skin cells.
- In response to this trauma, your body's immune system increases blood flow into the damaged area so white blood cells can remove the dead skin cells. This blood flow is what causes your sunburned skin to become warm and red.
- There is substantial evidence that sunburns can lead to DNA damage. Repeated sunburns dramatically increase your risk of developing skin cancer because of this damage to your DNA.

B. SUN EXPOSURE PRECAUTIONS

- Wear protective lotion. Sunscreen with SPF (sun protection factor) of 15 is recommended.
- Avoid prolonged exposure. (Especially during peak hours of 10:00 a.m. and 3:00 p.m.)
- Apply sunscreen liberally after swimming. (Apply periodically throughout day as a precaution)
- Use full or broad spectrum sunscreen. (These filter out UVA and UVB rays of the sun) Check expiration dates on products.
- Avoid exposing children under 6 months.
- Wear hat and protective clothing outdoors.

12 HOUR COSMETOLOGIST COMPOSITION

The Structure of Hair:



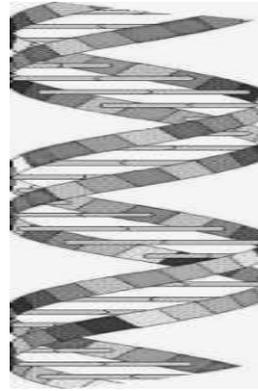
We will begin by defining the hair. Hair is composed primarily of proteins (88%). These proteins are of a hard fibrous type known as keratin. Keratin protein is comprised of what we call "polypeptide chains." The word, polypeptide, comes from the Greek word "poly" meaning many and "peptos" meaning digested or broken down.

In essence, if we break down protein, we have individual amino acids. Many (poly) amino acids joined together form a "polypeptide chain". Two amino acids are joined together by a "peptide bond", and the correct number of amino acids placed in their correct order will form a specific protein; i.e. keratin, insulin, collagen and so on.

The "alpha helix" is the descriptive term given to the polypeptide chain that forms the keratin protein found in human hair. Its structure is a coiled coil. The amino acids link together to form the coil and there are approximately 3.6 amino acids per turn of the helix (coil).

Each amino acid is connected together by a "peptide bond". The peptide bond is located between the carbon atom of one amino acid ex-

tending to bond with the nitrogen atom of the next amino acid.

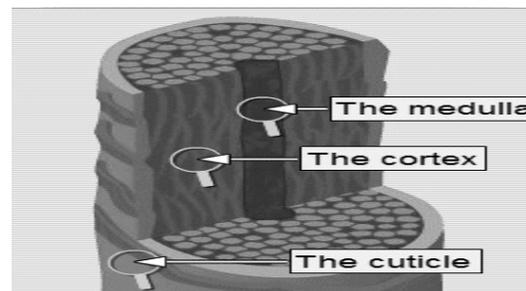


The A Helix Coil

In the organization of a single hair, three "alpha helices" are twisted together to form a "protofibrils". This is actually the first fibril structure of the hair. Nine protofibrils are then bundled in a circle around two or more to form an eleven-stranded cable known as the "micro fibril". These micro fibrils are embedded in an amorphous unorganized protein matrix of high sulfur content and hundreds of such micro fibrils are cemented into an irregular fibrous bundle called a "macro fibril".

These macro fibrils are grouped together to form the cortex (or the main body) layers of the hair fiber. Packed dead cells surround these structures and are known as the cuticular layers of the hair. In the center of these structures lies the medullary canal, which is actually a part of the excretory system and houses any foreign debris, heavy metals, synthetics and medications that are thrown off by the body and eventually released through the canal.

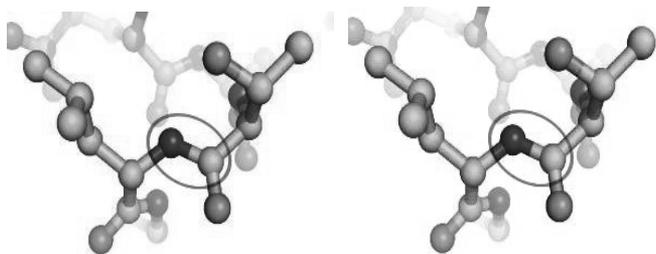
The Cortex



The cortex is the middle layer of the hair, located directly beneath the cuticle layer. End bonds connect the polypeptide chains of the cortex. End bonds are cross-linked by side bonds. This cross-linking forms the fibers and hair structure.

These chemical bonds hold the hair in its natural wave pattern and, are responsible for the incredible strength and elasticity of human hair. Breaking the side bonds of the cortex makes it possible to change the natural wave pattern of the hair.

Peptide Bonds (End Bonds)



The chemical bonds that join the amino acids are called peptide bonds, in turn, link together to form long chains of amino acids called polypeptide chains. Proteins are long, coiled, complex polypeptide chains that make of many different amino acids linked together, end-to-end, like pop beads.

It is important to note that peptide bonds should not be broken during any salon service. Breaking the hair's peptide bonds causes the polypeptide chains to come apart and dramatically weakens the hair. If used incorrectly, chemical hair texturizers can break peptide bonds and cause hair breakage. Chemical hair texturizers must be used carefully.

Side Bonds

The middle layer of the hair, the cortex, is made up of millions of polypeptide chains cross-linked with each other by three different types of side bonds. The bonds that link up the polypeptide chains of the hair are hydrogen, salt and disulfide bonds.

Hydrogen bonds account for one-third of the hair's strength. The hydrogen bond is a weak physical side bond that is easily broken by water or heat. Hydrogen bonds can be reformed by drying or cooling the hair. These bonds are very abundant in the hair.

Bonding in Keratin Protein

When the hair is in its normal unstretched state. It is referred to as A of alpha keratin. The original configuration of the hair is held in place by the bonding found in the cortex layers of the hair. As we stated earlier, keratin protein begins with an alpha helix building into protofibrils, micro fibrils, macro fibrils, and then cortex layers. The bonds in the hair are located within each and every alpha helix.

Disulfide Bonds

Disulfide bonds are formed between two cysteine amino acids, located on neighboring polypeptide chains. A disulfide bond joins a cysteine sulfur atom on one polypeptide chain with a second cysteine sulfur atom on a neighboring polypeptide chain to form cysteine, the oxidized form of cysteine. Disulfide bonds are weaker than peptide bonds, but are much stronger than hydrogen or salt bonds.

Disulfide bonds are strong chemical side bonds that are not broken by heat or water. Although there are far fewer disulfide bonds that are not broken by heat or water.

Although there are far fewer disulfide bonds than hydrogen or salt bonds, disulfide bonds are the strongest of the three side bonds and account for about one-third of the hair's overall strength. The chemical and physical changes in disulfide bonds make permanent waving, soft curl permanents (curl re-forming), and chemical hair relaxing possible.

Salt Bonds (Side Bonds)

Salt bonds are relatively weak physical side bonds that are the result of an attraction between opposite electrical charges. Salt bonds are easily broken by changes in pH, as in permanent waving, and re-form when the pH returns to normal. Even though salt bonds are far weaker than disulfide bonds, the hair has so many salt bonds that they account for about one-third of the hair's total strength.

Hydrogen Bonds (Side Bonds)

Hydrogen bonds are relatively weak physical side bonds that are the result of an attraction between opposite electrical charges. This bond is located between the coils of the alpha helix and is responsible for the ability of the hair to be stretched (elasticity) and return back to its original shape. The hydrogen bonds allow us to change the shape of the hair temporarily with the aid of water. Hydrogen bonds are easily broken by water, as in wet setting, or heat, in thermal styling, it is re-form as the hair dries or cools. Although individual hydrogen bonds are very weak, there are so many of them that they account for about one-third of the hair's total strength.

A wet set is an example of a physical change that results from breaking and re-forming the hydrogen bonds within the hair. Wetting the hair breaks the hydrogen bonds and permits the hair to be stretched and wrapped on rollers. Drying the hair removes the water and re-forms the hydrogen bonds in their new shape. These changes are only temporary. As soon as the hair is wet or is exposed to high humidity, it will return to its original shape. Thermal styling with hair dryers, curling irons, and pressing combs also break hydrogen bonds. These styles involve a physical change with temporary results. The hair returns to its original shape as soon as it is wet.

Understanding Hair Structure

A hair is a specialized outgrowth of part of the skin called the epidermis. It can be divided into two distinct parts, the hair follicle and the hair shaft.

- Hair follicle: is a small, curved pit buried deep in the fat of the scalp and is the point from which the hair grows. The hair follicle is well supplied with tiny blood vessels and the blood passing through them nourishes the growing region. Normal body temperature surrounds the hair follicle, which is not affected by cold or hot weather.

While animal hair, like that of a cat or horse, grows at different rates depending on the amount of natural light, which

varies according to the time of year, human hair too behaves similarly, growing a little faster in winter than in summer.

- Hair is composed of protein cells: and these die very soon. Which means that hair is made up of dead protein cells, therefore those products in the market claiming that they are meant to nourish and revive hair are false since a dead cell cannot be repaired. The differences seen after shampooing or conditioning are temporary measures to control and give a cosmetically aided short-lived solution that fades with time. However, since these work well enough for that special day out or the first half of office hours, these temporary fixes are accepted by the majority of hair care product users.
- A hair shaft is an important part of hair structure: it is composed of three concentric layers namely, the medulla, which is the innermost layer and does not get affected by hair care products or processes, the middle layer is the cortex which contains the pigment and can be modified a bit through dyeing, bleaching, perming and straightening while the outer layer is the cuticle, made up of tiny overlapping scales that protect the cortex. The condition of these scales determines your hair health for the day and if hair cuticles are smooth and lie flat, they make hair look glossy and sleek while broken ends at the cuticles is a sign of cortex damage, caused due to breakage, split ends and gives a brittle, dry and frizzy look.

Hair is actually dead protein that leaves its root and therefore does not hurt when trimmed with a scissor. On an average scalp, there are close to 100-150 thousand hair fibers and usually blondes have more fibers than red or dark haired heads. Keratin, responsible for elasticity of fingernails, also lends the same to hair, which gives hair the strength like a wire of iron so that it can rip when a force equivalent to 60kg is applied after it has stretched itself for about 70 percent.

Client Consultation

The client consultation is one of the most important parts of a successful texture service. Before proceeding with any service, you must first determine exactly what the client expects and what is possible. No matter how advanced your technical skills are nothing will compensate for a lack of communication between you and your client.

- Always greet your client by name and introduce yourself.
- Ask open-ended questions that allow you to find out why the client wants the texture service and what results are expected.

- Look at pictures with your client to determine exactly what she wants.
- Ask about past texture services. Determine what the client liked and did not like.
- Ask how the client currently styles her hair and discuss any changes that would result from the texture service.
- Determine the finished hairstyle the client wants, considering the haircut and the degree of texture or relaxing that is needed.
- Evaluate the condition, texture, and wave pattern of the hair to make sure that the desired style is possible.
- Fill out a permanent wave record to document the condition of the hair and the desired outcome.

Client Records

Client records should include a complete evaluation of the length, texture, color, and condition of the hair prior to the service, and the results that are expected.

Extra caution should be used to determine any previous problems or adverse reactions the client may have had in the past. This information must be reevaluated prior to each service since there may have been changes in the client's history or in the formulation of the product since it was last used.

Also include in your records the type of perm, the type, and size of perm tools (rods), base direction, base control, wrapping technique, wrapping pattern, processing time, and the results achieved. Always remember to update your records and note any changes.

Client Release Form

Some schools and salons may require a client to sign a release form prior to receiving any chemical service. Although most release forms state that the school or salon is not responsible for any damages that may occur, they do not release the school or salon from all responsibility.

Release forms do indicate that the client knew, before the chemical service was given, that there was a possibility of damage to the hair or an unexpected adverse reaction.

Scalp Analysis

An analysis of the scalp should always be performed prior to a chemical service. A complete analysis will help you determine how the hair will react to the service and will help avoid most problems.

The condition, texture, and wave pattern of the hair must be considered when selecting the type of relaxer, perm, the type, and size of perm tool, and the wrapping method.

Hair Analysis

Hair is the fastest growing appendage on the human body. Anything that affects our general health also affects our hair. Diet, exercise, medications, and stress all affect hair growth. The quality of any permanent wave is directly related to the quality of the hair. All other things being equal, strong hair usually produces much stronger curls than weak hair.

Hair analysis is an essential part of a successful chemical hair service. A complete analysis will help you determine how the hair will react to the service and will help avoid most problems. The condition, texture, and wave pattern of the hair must be considered when selecting the type of relaxer, per, the type and size of perm tool, and the wrapping method. The five most important factors to consider in hair analysis are texture, density, porosity, elasticity, and growth direction.

Hair Texture

Hair texture describes the diameter of a single strand of hair and is classified as coarse, medium, or fine. Hair density differs not only from one individual to another but also from strand to strand on the same person's head. It is best determined by feeling a single, dry strand between the fingers. The three types of hair have the following characteristics.

- Coarse hair usually requires more processing than medium or fine hair and may be more resistant to that processing. It is usually more difficult for permanent waving solutions to penetrate coarse hair.
- Medium hair is the most common hair texture. It is considered normal and does not pose any special problems or concerns.
- Fine hair is more fragile, easier to process, and more susceptible to damage from perm services than is coarse or medium hair. As a rule, fine hair will process faster and more easily than medium or coarse hair.

Hair Density

Hair densities measure the number of strands of hair on the head, indicating how thick or thin the hair is. Individuals with the same hair texture can have different densities.

Some individuals with fine hair texture, characterized by each hair having a small diameter, may have high density, with many individual hairs per square inch.

Others with coarse hair texture, characterized by each hair having a large diameter, may have low density, with few individual hairs per square inch.

Resistant hair has a tight, compact cuticle layer that resists penetration. Chemical services performed on resistant hair require a more alkaline

solution. A high pH raises the cuticle and permits uniform saturation and processing. Resistant hair also requires a slow and thorough application of perm solution to ensure complete saturation.

- Hair with normal porosity is neither resistant nor overly porous. Texture services performed on this type of hair will usually process as expected.
- Overly porous hair has a raised cuticle layer that easily absorbs solution. Chemical services performed on overly porous hair require a less alkaline solution than those performed on resistant hair. A lower pH minimizes swelling and helps prevent excessive damage to the hair.

Direction of Hair Growth

The individual growth direction of the hair causes hair streams, whorls, and cowlicks that influence the finished hairstyle and must be considered when selecting the base direction and wrapping pattern for each permanent wave.

Permanent waving is a two-step process:

1. The first part of any perm is the physical change caused by wrapping the hair on the perm rods.
2. The second part involves the chemical changes caused by the permanent waving solution and the neutralizer.

The Perm Wrap

In permanent waving, the size, shape, and type of curl are determined by the size, shape, and type of tool used in wrapping the hair. Permanent waving solution, by itself, does not cause the hair to curl any more than water causes a wet set to curl. Permanent waving solution simply softens the hair, allowing it to conform to the shape in which it was wrapped. As long as a perm is processed correctly, what you wrap is what you get.

The first part of any permanent involves wrapping the hair in the desired shape. In a perm wrap, just as in a wet set, wetting the hair with water breaks the hydrogen bonds and permits the hair to be wrapped in the desired shape. A perm wrap is essentially a wet set on perm rods instead of rollers. The major difference between a wet set and a permanent wave is the type of side bonds that are broken. A wet set breaks hydrogen bonds. A permanent wave breaks disulfide bonds.

The size of the perm tool determines the size of the curl. Small tools produce small curls and large tools produce large curls. Wrapping the hair on small tools increases the tension, which increases the amount of curl.

While tension produces curls, too much can cause marking or breaking of the hair. Keep the hair wet while wrapping, and always wrap with uniform, even tension.

Sectioning

All perm wraps begin by sectioning the hair into panels. The size, shape, and direction of these panels vary, based on the type of wrapping pattern and the type and size of the tool being used. Each panel is further divided into subsections called base sections. One tool is

normally placed on each base section. The size of each base section is usually the length and width of the tool being used.

Base Control

Base control refers to the position of the tool in relation to its base section and is determined by the angle at which the hair is wrapped. Tools can be wrapped on base, half off base, or off base.

In on-base placement, the hair is wrapped at an angle 45 degrees beyond perpendicular to its base section. The tool is positioned on its base section.

Although on-base placement may result in greater volume at the scalp area, any increase in volume will be lost as soon as the hair begins to grow out. Caution should be used with on-base placement because of the additional stress and tension it places on the hair. Wrapping hair on base may damage or break the hair.

Half-off base placement refers to wrapping the hair at an angle of 90 degrees (perpendicular) to its base section. The tool is positioned half off its base section. Half-off-base placement minimizes stress and tension on the hair.

Off-base placement refers to wrapping the hair at an angle 45 degrees below perpendicular to its base section. The tool is positioned completely off its base section. Off base placement creates the least amount of volume and results in a curl pattern that begins farthest away from the scalp.

Base Direction

Base direction refers to the angle at which the tool is positioned on the head: horizontally, vertically, or diagonally.

Base direction also refers to the directional pattern in which the hair is wrapped. Although directional wraps can be wrapped backward, forward, or to one side, wrapping with the natural direction of hair growth causes the least amount of stress to the hair. Wrapping against the natural growth pattern causes excess stress that may damage or break the hair.

Wrapping Techniques

There are two basic methods of wrapping the hair around the perm tool: croquignole and spiral.

In croquignole perms, the hair strands are wrapped from the ends to the scalp, in overlapping layers. Because the hair is wrapped at an angle perpendicular to the length of the tool, each new layer of hair is wrapped toward the scalp on top of the previous layer.

This increases the effective size of the tool with each new overlapping layer and produces a tighter curl at the ends and a larger curl at the scalp. Longer thicker hair increases this effect.

In most spiral perms, the hair is wound from the ends to the scalp although depending on the tools used, some may also be wrapped from the scalp to the ends.

The difference should not affect the finished curl. In a spiral perm wrap, the hair is wrapped at an angle other than perpendicular to the length of the tool. The angle at which the hair is wrapped caused the hair to spiral along the length of the tool, like the grip on a tennis racket.

Although the layers in a spiral perm wrap may partially overlap the preceding layers, as long as the angle remains constant, any overlap will be uniform along the length of the tool and the entire strand of hair.

This wrapping technique causes the effective size of the tool to remain the same along the entire length of the strand, producing a uniform curl from the scalp to the ends. Longer, thicker hair will benefit the most from this effect.

Perm Tools

As we have noted, in permanent waving, the size of the tool determines the size of the curl. The shape and type of curl is determined by the shape and type of tool and the wrapping method. Selecting the correct perm tool and wrapping method is the key to creating a successful permanent. Perm tools come in a wide variety of sizes and shape that can be combined with different wrapping methods to provide an exciting range of styling options.

Types of Rods

Concave rods are the most common type of perm rod. They are usually used with a croquignole wrapping technique. Concave rods have a smaller circumference in the center that increases to a larger circumference on the ends. They produce a tighter curl in the center and a looser, larger curl on either side of the strand.

Straight rods are also usually used with a croquignole wrapping technique. Since straight rods are equal in circumference along their entire length or curling area, they produce a uniform curl along the entire width of the strand.

Concave and straight rods come in different lengths. Since the length of the base section is usually the same length as the rod, fewer rods are required when using long rods. Long, straight rods can also be used with a spiral wrapping technique to produce spiral perms, as long as the length of the rod will accommodate the length of the hair.

Although more rods may be needed when using short rods, they fit closer to the rounded curvatures of the head. Short rods can also be used for wrapping small and awkward sections where long rods would not fit.

Other Perm Tools

Soft bender rods are usually about 12 inches long with a uniform diameter along the entire length. These soft foam rods have a stiff wire inside that permits them to be bent into almost any shape.

Soft bender rods can be used with either a croquignole or spiral wrapping technique.

End Papers

End papers or end wraps are absorbent papers used to control the ends of the hair when wrapping and winding hair on the perm tools. End papers should extend beyond the ends of the hair to keep them smooth and straight and prevent "fishhooks".

The most common end paper techniques are the double flat wrap, the single flat wrap, and the bookend single paper wrap.

- The **double flat wrap** uses two end papers, one placed under, and one over the strand of hair being wrapped. Both

papers extend past the hair ends. This wrap provides the most control over the hair ends and helps keep them evenly distributed over the entire length of the tool.

- The **single flat wrap** is similar to the double flat wrap, but uses only one end paper, placed over the top of the strand of hair being wrapped.
- The **bookend wrap** uses one end paper folded in half over the hair ends like an envelope. Refolded end papers are available, or you can fold a single large end paper and place it over the top and bottom of the hair so that it extends past the hair ends. The bookend wrap eliminates excess paper and can be used with short rods or with very short lengths of hair. Be careful to distribute the hair evenly over the entire length of the rod. Avoid bunching the ends together toward the center of the rod.

The Chemistry of Permanent Waving

Alkaline permanent waving solution softens and swells the hair, which raises the cuticle and permits the solution to penetrate into the cortex. Note that there is far less swelling of the cuticle layer. Once in the cortex, the waving solution breaks the disulfide bonds through a chemical reaction called reduction. A reduction reaction involves either the addition of hydrogen or the removal of oxygen. The reduction reaction in permanent waving is due to the addition of hydrogen.

In examining the reduction reaction more closely, we can see that a disulfide bond joins a sulfur atom on one polypeptide chain with a second sulfur atom on a neighboring polypeptide chain. Permanent waving solution breaks a disulfide bond by adding a hydrogen atom to each of the sulfur atoms in the disulfide bond. The sulfur atoms attach to the hydrogen from the permanent waving solution, breaking their attachment to each other. Once the disulfide bond is broken, the polypeptide chains are able to slip into their new curled shape.

The reducing agents used in permanent waving solutions are thio compounds, commonly referred to simply as thio. Thioglycolic acid is the most common. It is a colorless liquid with a strong unpleasant odor. Thioglycolic acid provides the hydrogen that causes the reduction reaction in permanent waving solutions.

The strength of the permanent waving solution is determined by the concentration of thio. Stronger perms have a higher concentration of thio with a greater number of hydrogen atoms. When more hydrogen atoms are available, more disulfide bonds are broken.

Thioglycolic acid is an acid, and since acids do not swell the hair or penetrate into the cortex, it is necessary for manufacturers to add an alkalizing agent. The addition of ammonia to Thioglycolic acid produces a new chemical called ammonium thioglycolate, which is alkaline. ATG is the main active ingredient or reducing agent in alkaline permanents.

The degree of alkalinity (pH) is a second factor in the overall strength of the permanent waving solution.

Coarse hair with a strong, resistant cuticle layer may need the additional swelling and penetration that is provided by a more alkaline permanent waving solution.

Porous hair with a damaged cuticle layer is easily penetrated. This type of hair can be damaged by a high alkaline permanent waving solution. The pH (alkalinity of the perm solution should correspond to the resistance, strength, and porosity of the cuticle layer.

Types of Permanent Waves

A variety of permanent waves is available in salons today. Brief descriptions of the most commonly used perms follow.

Alkaline Waves or Cold Waves

The first alkaline waves (or cold waves) were developed in 1941 and relied on the same ATG that is still used in most alkaline waves today. Since alkaline waves process at room temperature without the addition of heat, they became commonly known as cold waves. Most alkaline waves have a pH between 9.0 and 9.6.

True Acid Waves:

The first true acid waves were introduced in the early 1970s. Most true acid waves have a pH between 4.5 and 7.0 and require heat to speed processing. Glycerol monothioglycolate (GMTG) is the main active ingredient and is an acid, with a low pH. Although a lower pH tends to cause less damage to the hair, acid waves process more slowly, may require the added heat of a hair dryer, and do not usually produce as firm a curl as alkaline waves.

All acid waves have three separate components: permanent waving solution, activator, and neutralizer. The activator tube contains GMTG, which must be added to the permanent waving solution immediately before use.

Although GMTG is the primary reducing agent in all modern acid waves, it may not be the only reducing agent. Most of these waves also contain ATG, just like a cold wave. Although the low pH of acid waves may seem ideal, repeated exposure to GMTG is known to cause allergic sensitivity in both hairstylists and clients.

Exothermic Waves:

An exothermic chemical reaction produces heat. Exothermic waves create an exothermic chemical reaction that heats up the solution and speeds up the processing.

All exothermic waves have three components: permanent waving solution, an activator, and a neutralizer. The permanent waving solution contains thio, just as in a cold wave. The activator contains an oxidizing agent (usually hydrogen peroxide.) that must be added to the permanent waving solution immediately before use. Mixing an oxidizer with the permanent waving solution causes a rapid release of heat and an increase in the temperature of the solution. The increased temperature increases the rate of the chemical reaction, which shortens the processing time.

Endothermic Waves:

An endothermic chemical reaction is one that absorbs heat from its surroundings. Endothermic waves are activated by an outside heat source, usually a conventional hood-type hair dryer. Endothermic waves will not process properly at room temperature. Most true acid waves are endothermic and require the added heat of a hair dryer.

Ammonia-Free Waves

Ammonia-free waves use an ingredient that does not evaporate as readily as ammonia, so there is very little odor associated with their use. Amino methyl propanol (AMP) and monoethanolamine (MEA) are examples of alkanolamines that are used in permanent waving solutions as a substitute for ammonia. Even though these solutions may not smell as strong as ammonia, they can still be every bit as alkaline and just as damaging. Ammonia-free does not necessarily mean damage-free.

Thio-Free Waves

Thio-free waves use an ingredient other than ATG as the primary reducing agent. The most common thio-free waves rely on cysteamine, or mercaptamine. Although these thio substitutes are not technically ATG, they are still thio compounds. Although thio-free is often marketed as damage-free, that is not necessarily true. At a high concentration, the reducing agents in thio-free waves can be just as damaging as thio.

Low-PH Waves

The use of sulfates, sulfites, and bisulfites presents an alternative to ATG known as low-pH waves. Sulfites work at a low pH and have been used in perms for years, but they have never been very popular. Permanents based on sulfites are very weak and do not provide a firm curl, especially on strong or resistant hair. Sulfite permanents are usually marketed as body waves or alternative waves.

Selecting the Right Type of Perm:

It is extremely important to select the right type for each client. Every client has hair with its own distinct texture and condition, so individual needs must always be addressed. After a thorough consultation, you should be able to determine which type of permanent is best suited to your client's hair type, condition, and desired results.

Permanent Wave Processing:

The strength of any permanent wave is based on the concentration of its reducing agent. In turn, the amount of processing is determined by the strength of the permanent waving solution. If weak permanent waving solution is used on coarse hair, there may not be enough hydrogen atoms to break the necessary number of disulfide bonds, no matter how long the permanent processes. However, the same weak solution may be exactly right for fine hair with fewer disulfide bonds. On the other hand, a strong solution, which releases many hydrogen atoms, may be perfect for coarse hair, but too damaging for fine hair.

The amount of processing should be determined by the strength of the solution, instead of how long the perm processes.

In permanent waving, most of the processing takes place as soon as the solution penetrates the hair, within the first five to ten minutes. The additional processing should be determined by the strength of the solution, not necessarily how long the perm process.

In permanent waving, most of the processing takes place as soon as the solution penetrates the hair, within the first five to ten minutes. The additional processing time allows the polypeptide chains to shift into their new configuration.

Over processed Hair:

If you find that your client's hair has been over processed, it probably happened within the first five to ten minutes of the service, and a weaker permanent waving solution should have been used. If the hair is not sufficiently processed after ten minutes, it may require a reapplication of solution. Resistant hair requires a stronger solution, and a more thorough saturation.

Thorough saturation of the hair is essential to proper processing in all permanent waves, but especially on resistant hair. Regardless of the strength or pH of the solution, resistant hair may not become completely saturated with just one application of waving solution. You may need to apply the solution slowly and repeatedly until the hair is completely saturated.

A thorough saturation with stronger solution will break more disulfide bonds and process the hair more, but processing the hair more does not necessarily translate into more curl. A properly processed permanent wave should break and rebuild approximately 50 percent of the hair's disulfide bonds. If too many disulfide bonds are broken, the hair may not have enough strength left to hold the desired curl. Weak hair equals a weak curl.

Contrary to what many believe, over processed hair does not necessarily mean hair that is overly curly. If too many disulfide bonds are broken, the hair will be too weak to hold a firm curl. Over processed hair usually has a weak curl or may even be completely straight. Since the hair at the scalp is usually stronger than the hair at the ends, over processed hair is usually curlier at the scalp and straighter at the ends. If the hair is over processed, processing it more will make it straighter.

Under processed Hair

Under processed hair is, as the name suggests, the exact opposite of over processed hair. If too few disulfide bonds are broken, the hair will not be sufficiently softened and will not be able to hold the desired curl. Under processed hair usually has a very weak curl, but it may also be straight. Since the hair at the scalp is usually stronger than the ends, under processed hair is usually straighter at the scalp and curlier at the ends. If the hair is under processed, processing it more will make it curlier.

Permanent Waving Neutralization

Neutralization is the process of stopping the action of a permanent wave solution and hardening the hair in its new form by the application of a chemical solution called the neutralizer. Neutralization performs two important functions.

1. It deactivates (neutralizers) any waving solution that remains in the hair.
2. It rebuilds the disulfide bonds that were broken by the waving solution.

The neutralizers used in permanent waving are oxidizers. In fact, the term neutralizer is not very accurate because the chemical reaction involved is actually oxidation. The most common neutralizer is hydrogen peroxide. Concentrations vary between 5 volume (1.5 percent) and 10 volume (3 percent).

Neutralization: Stage One

The first function of permanent waving neutralization is the deactivation, or neutralization, of any waving lotion that remains in the hair after processing and rinsing. The Chemical reaction involved is oxidation.

As we know, oxidation reactions can also lighten hair color, especially at an alkaline PH level. To avoid scalp irritation and unwanted lightening of the hair color, always rinse the perm solution from the hair at least five minutes before applying the neutralizer. After rinsing and before applying the neutralizer, the hair should be blotted with towels to remove as much moisture as possible. Blot each rod several times using dry towels. Excess water left in the hair prevents even saturation and dilutes the neutralizer.

Some manufacturers recommend the application of a pre-neutralizing conditioner after blotting and before application of the neutralizer. An acidic liquid protein conditioner can be applied to the hair and dried under a warm hair dryer for five minutes or more prior to neutralization.

This added step is especially beneficial with much damaged hair because it strengthens the hair prior to neutralization. This step is optional, however. Always follow the manufacturers' directions and the procedures approved by your instructor.

Neutralization: Stage Two

As you have learned, waving solution breaks disulfide bonds by adding hydrogen atoms to the sulfur atoms in the disulfide bond. Neutralization rebuilds the disulfide bonds by removing those extra hydrogen atoms. The hydrogen atoms in the disulfide bonds are so strongly attracted to the oxygen in the neutralizer that they release their bond with the sulfur atoms and join with the oxygen. Each oxygen atom joins with two hydrogen atoms to rebuild one disulfide bond and make one molecule of water. The water is removed in the final rinse, and the disulfide bonds form in their new curled position.

When the neutralizer removes the extra hydrogen atoms, each sulfur atom forms a bond with its nearest neighboring sulfur atom. The strength of these newly formed disulfide bond pairs holds the hair in its new shape.

Post-Perm Hair Care:

For a variety of reasons, most hairstylists have always recommended a three-day waiting period before shampooing freshly permed hair. Although some of their concerns may be valid, a properly neutralized perm is stable. The bonds in the hair are re-formed immediately, and there is no scientific basis for the standard three-day waiting period. Shampooing a properly processed permanent with the mild acid-balanced shampoos that are available today should not cause excessive relaxation or damage to the hair or scalp.

Most hairstylists have also recommended a three-day waiting period before performing hair color services on freshly permed hair. Although there may be some concern about scalp irritation or excessive relaxation, a permanent is stable as soon as it has been properly neutralized.

Unless there are signs of scalp irritation, modern demi permanent, deposit-only hair colors are safe to use on freshly permed hair. Always follow the manufacturers' directions and the procedures approved by your instructor.

Safety Precautions for Permanent Waving

Always protect your client's clothing. Have the client change into a gown, use a waterproof shampoo cape, and double drape with towels to absorb accidental spills.

Do not give a permanent to any client who has experienced an allergic reaction to previous permanent.

Do not save any opened, unused waving lotion or neutralizer. These lotions may change in strength and effectiveness if not used promptly.

Do not dilute or add anything to the waving lotion or neutralizer unless specified in the manufacturer's directions.

Keep waving lotion out of the client's eyes and away from the client's skin. In case of accidental exposure, rinse thoroughly with cool water.

Always, follow the manufacturer's directions.

Wear gloves when applying solutions.

Immediately, replace cotton or towels that have become wet with solution.

Always examine the scalp before the perm service. Do not proceed if there are any skin abrasions or any signs of scalp disease.

Do not perm hair that is excessively damaged or shows signs of breakage.

Do not attempt to perm hair that has been previously treated with hydroxide relaxers.

Always, perform a test for metallic salts to see if there is a possibility that metallic hair color was used on the hair previously.

Always, apply protective barrier cream around the client's hairline and ears prior to applying permanent waving solution.

The hair should be given reconditioning treatments until the condition improves and the damaged hair can be cut off.

Metallic Salts

Some home hair coloring products contain metallic salts that are not compatible with permanent waving. Metallic salts leave a coating on the hair that may cause uneven curls, severe discoloration, or hair breakage.

Metallic salts are commonly found in men hair colors that are sold for home use. Hair color restorers and progressive hair colors that darken the hair gradually with repeated applications are the most likely to contain metallic salts. If you suspect that metallic salts may be present on the hair, perform the following test.

In a glass or plastic bowl, mix 1 ounce of 20-volume peroxide with 20

drops of 28 percent ammonia. Immerse at least 20 strands of hair in the solution for 30 minutes. If metallic salts are not present, the hair will lighten slightly and you may proceed with the service. If metallic salts are present, the hair will lighten rapidly. The solution may get hot and give off an unpleasant odor, indicating that you should not proceed with the service.

Let us now turn to the basic perm procedures. The information presented earlier in the chapter on sectioning, base control, base direction, perm tools, wrapping techniques, and wrapping patterns should be used with the following procedures. These basic wrapping methods may be combined in different ways to create a wide variety of specialized perm wraps that provide an unlimited number of styling options.

The basic perm wrap is also called a straight set wrap. In this wrapping pattern, all the tools within a panel move in the same direction and are positioned on equal-size bases. All base sections are horizontal, with the same length and width as the perm tool. The base control is half off base.

In the curvature perm wrap, the movement curves within sectioned-out panels. Partings and base radiate throughout the panels to follow the curvature of the head. This wrapping pattern uses pie-shaped base sections in the curvature areas.

The brick lay perm wrap is similar to the actual technique of bricklaying. Base sections are offset from each other row by row, to prevent noticeable splits and to blend the flow of the hair. Different brick lay patterns use different starting points (front hairline, occipital area, and crown), and these can be used with different combinations of sectioning, base control, base direction, wrapping techniques, and perm tools.

The weave technique uses zigzag partings to divide base areas. It can be used throughout the entire perm wrap or can be kept to selected areas. This technique is very effective for blending between perm rods with opposite base directions. It can also be used to create a smooth transition from the rolled areas into the unrolled areas of a partial perm. The wave technique can be used with a variety of base directions, wrapping patterns, and perm tools.

The double tool technique is also called a piggyback wrap because two tools are used for one strand of hair, one on top of the other. The lower half of the strand is wrapped around one tool, and then the upper half of the same strand is wrapped around a second tool and stacked on top of the first.

The double tool technique doubles the number of tools used. Using more tools increases the amount of curl in the finished perm, making this technique especially effective on long hair. Tools with different diameters may be used to create different effects. This technique can also be used with a variety of base directions, wrapping patterns, and perm tools.

Unlike other techniques that are performed at an angle perpendicular to the length of the tool, the spiral perm technique, also called a spiral perm wrap is done at an angle that causes the hair to spiral along the length of the tool, like the grip on a tennis racket.

Although the layers in a spiral perm may partially overlap as they go along, as long as the angle remains constant, any overlap will be uniform along the length of the tool and the entire stand of hair. Since the effective size of the tool remains constant along the entire strand of hair, this technique produces a uniform curl from the scalp to the ends. Longer, thicker hair will benefit most from this effect.

The spiral wrapping technique can be used with a variety of base sections, base directions, and wrapping patterns. Base sections may be either horizontal or vertical and do not affect the finished curl.

Conventional rods, bendable soft foam rods, and the circle tool can all be used for this technique, depending on the length of the hair.

The implements and materials and the procedures for preparation, processing, and cleanup are the same for all perms, as described in the Basic Perm Wrap.

Preliminary Test Curls

Taking preliminary test curls helps you predict how your client's hair will react to a perm. It is advisable to take preliminary test curls if the hair is damaged or if there is any uncertainty about the results. Preliminary test curls provide the following information:

Correct processing time for optimal curl

Results you can expect from the type of perm solution you have selected

Curl results for the tool size and wrapping technique you are planning to use

Partial Perms:

If your client wants a perm but does not wish for the entire head of hair to be curled, a partial perm may be the answer. Partial perms also allow you to give a perm when some of the hair is too short to roll on tools. Partial perms can be used for:

Male and female clients who have long hair on the top and crown, but very short hair with tapered sides and nape.

Clients who only need volume and lift in certain areas.

Clients who desire a hairstyle with curls along the perimeter but a smooth, sleek crown.

Partial perms rely on the same techniques and wrapping patterns as those used with other perms, but there are some additional considerations.

In order to make a smooth transition from the rolled section to the unrolled section, use a larger tool for the last tool next to an unrolled section.

Applying waving lotion to unrolled hair may straighten it or make it difficult to style. To protect the unrolled hair, apply a protective barrier cream to the unrolled section before applying the waving lotion.

TRUE OR FALSE (24 HR. HAIRCUTTING PRINCIPLES)

8 HR. TRENDY AND CREATIVE CUTS

1. A good haircut serves as the foundation of most every other service offered in the salon.
2. Understanding the reference points will help ensure balance within the design.
3. Where the head starts to curve away from the comb is the parietal ridge.
4. The Occipital Bone protrudes at the base of the skull.
5. The Apex is the highest point on the top of the head .
6. A **Line** is a thin, continuous mark used as a guide.
7. A great haircut always begins with a great consultation.
8. Another part of consultation is analyzing the face shape.
9. As a rule, always stand in front of the area you are working on, and position your hands according to the cutting line.
10. Hair texture is the general quality and feel of the hair.

4 HR. MAINTAINING HEALTHY SKIN

1. Essentially all face masks have some sort of a cleansing action.
2. Tinted moisturizers can be used under foundation cosmetics.
3. The sun is the most damaging environmental factor to the health and appearance of skin.
4. Dry skin is a very common skin condition, usually characterized by irritated skin and itchiness.
5. There is no known way to prevent psoriasis.
6. Rosacea is a common skin condition that usually only affects the face and eyes.
7. Herpes Simplex: also known as fever blister, is a contagious.
8. Overexposure to the sun's UV rays results in a painful sunburn.
9. Wear protective lotion. Sunscreen with SPF (sun protection factor) of 15 is recommended.
10. Apply sunscreen liberally after swimming. (Apply periodically throughout day as a precaution)

12 HR. COSMETOLOGY COMPOSITION

1. The chemical bonds that join the amino acids are called peptide bonds.
2. Disulfide bonds are formed between two cysteine amino acids
3. Coarse hair usually requires more processing than medium or fine hair and may be more resistant to that processing.
4. In permanent waving, the size, shape, and type of curl are determined by the size, shape, and type of tool used in wrapping the hair.
5. Base direction refers to the angle at which the tool is positioned on the head: horizontally, vertically, or diagonally.
6. There are two basic methods of wrapping the hair around the perm tool: croquignole and spiral.
7. An exothermic chemical reaction produces heat.
8. The basic perm wrap is also called a straight set wrap.
9. Preliminary test curls helps you predict how your client's hair will react to a perm.
10. Applying waving lotion to unrolled hair may straighten it or make it difficult to style.

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8HR. TRENDY AND CREATIVE CUTS

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

TEST 2

4 HR. MAINTAINING HEALTHY SKIN

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

TEST 3

12 HR. COSMETOLOGY

1. _____ 6. _____
2. _____ 7. _____
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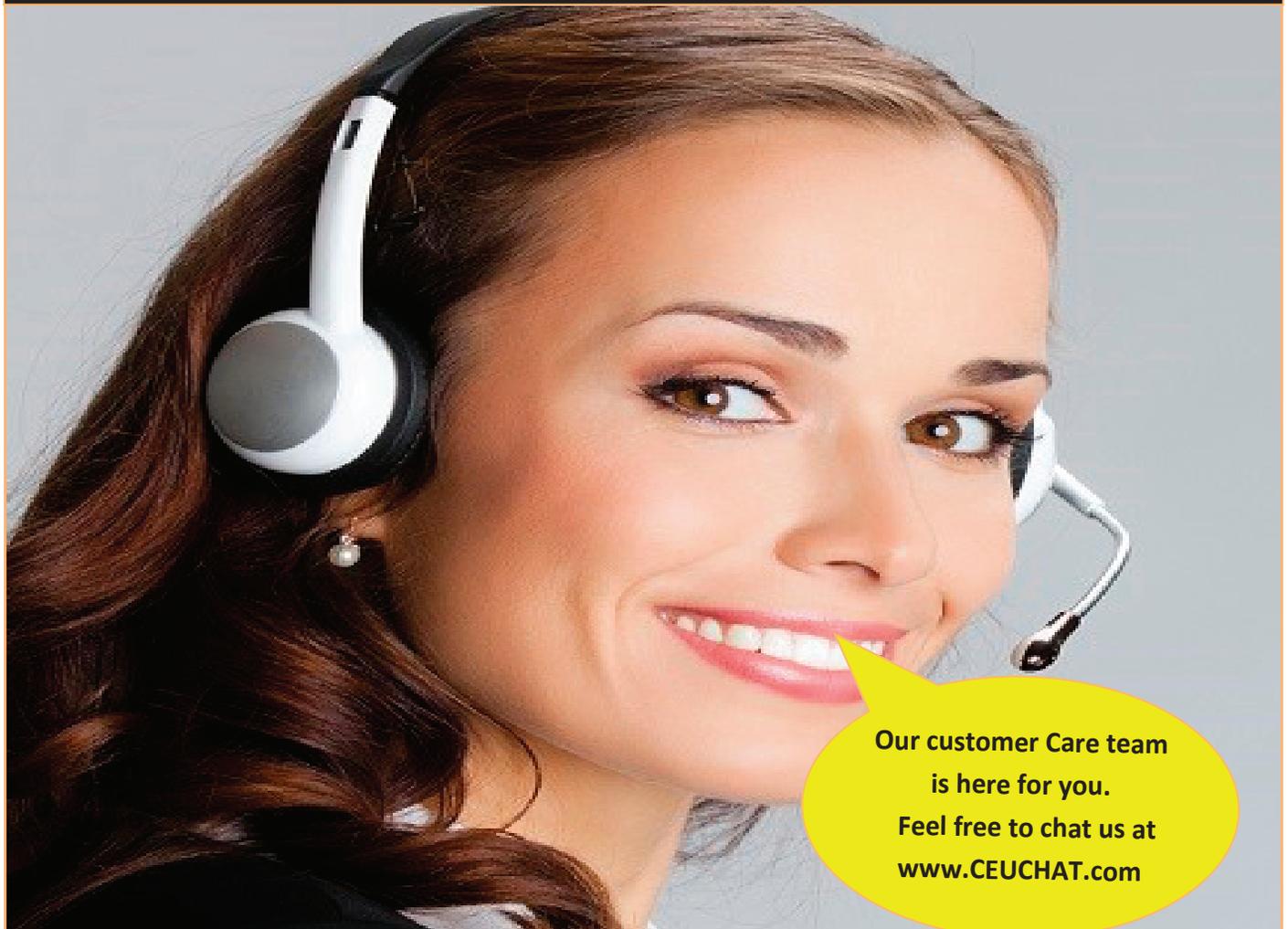
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