

Color Theory (8 hours)

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Module 1:Hair Coloring

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Key Terms

<i>aniline</i>	<i>eumelanin</i>	<i>preliminary strand test</i>
<i>bialage</i>	<i>melanin</i>	<i>porosity</i>
<i>complementary</i>	<i>new growth</i>	<i>predisposition</i>
<i>decolorization</i>	<i>oxidation</i>	<i>resistant</i>
<i>disinfectant</i>	<i>pheomelanin</i>	<i>single-process hair coloring</i>

Learning objectives:

After completing this lesson you will be able to:

- describe the porosity test
- identify the level system, the level system chart and it's values
- describe properties of the color wheel
- define primary, secondary, tertiary and complementary colors
- list the different types of hair coloring product formulations and their use
- identify procedures and purpose of the patch test
- identify the purpose of hair coloring product developers
- describe the process of decolorization, the decolorization chart and it's values
- describe contributing pigment, the contributing pigment chart and it's values
- list procedures for a preliminary strand test
- describe the application of single-process hair coloring
- list procedures of a single-process retouch
- describe the application of semi-permanent hair coloring
- describe baliage hair coloring
- list procedures for temporary hair coloring application

Introduction

The purpose of this study module is to review the principles, practices and theories of hair coloring. **Precautions:** To ensure the safety and accuracy of product use for coloring services that you perform, please consult the product company and their published instructions and information regarding their formulations. Never take for granted that you already know how to prepare or process hair coloring products that you are unfamiliar with. To do so could cause injury to yourself or your client. Also, keep in mind that companies sometimes change their formulations. This may or may not effect the way you mix and apply their product. However, to be abreast of any changes, you should establish the practice of reading all packaging enclosures, labels and instructions as part of your customary preparations prior to performing color services.

Color Theory

Porosity

One of the first things to consider when planning a color service is the degree of porosity of the hair. **Porosity is defined as the hair's ability to absorb moisture.** It is not to be confused with hair texture. These are two different terms that refer to two different aspects of the hair.

The amount of porosity is to be analyzed and placed into one of three categories. Cosmetic Art Science terms these categories as “degrees of porosity”.

The degrees of porosity are: low, average and high.

There are clinical techniques to determine hair porosity. During testing you will be using your sense of touch to categorize the client's hair.

You will test the four main areas of the head:

1. the front hairline
2. the temple
3. the crown
4. the nape

Create a small strand of just a few hairs and hold it perpendicular to the head. With the opposite hand, grasp the hair strand using your thumb and forefinger then slide your fingers slowly and gently from the ends to the scalp. You are feeling for the amount of roughness of the hair cuticle.

The smoother the hair feels the lower the degree of porosity that is present. **The rougher the hair feels the higher degree of porosity that is present.**

Low Porosity: The hair feels smooth when tested.

Hair that has a low degree of porosity has a lessened ability to absorb moisture and is considered resistant to chemicals. **Hair that has a low degree of porosity might take longer to process.**

Average Porosity: The hair feels slightly rough.

Hair that has an average degree of porosity is considered normal. It is for this degree of porosity that chemical formulations of hair color are designed for when the label refers to processing instructions for “normal” hair.

High Porosity: The hair feels very rough.

Hair that has a high degree of porosity is considered overly porous. **Color processing takes less time and the hair may lose its color quicker due to the open cuticle.**

Texture

Texture is the term used in Cosmetic Art Science to describe the diametric measurement of a hair strand. There are three categories of measurement when analyzing the diameter of a hair strand: large, medium and small. The corresponding terms for these textures are termed as: **coarse, medium and fine.**

Analyzing the clients' hair texture is important when planning a color service for the following reasons.

Melanin

Melanin (pigment) is created and dispersed in varying amounts in each of the texture categories. **Melanin is most compact in fine hair and less compact in coarse hair.** Where there is more compact melanin, the hair can take on more depth and become darker during a color service. Where there is less compact melanin, the hair can take longer to process. It is important to consider this theory during the planning phase of a color service.

Eumelanin

Eumelanin is the pigment that is found in natural hair that gives it tonal hues of blacks and browns.

Pheomelanin

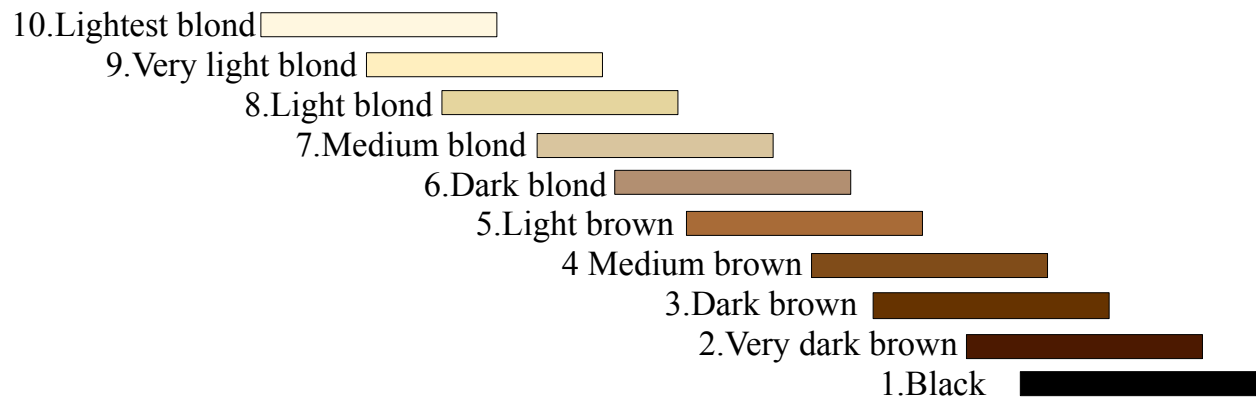
Pheomelanin is the pigment that is found in natural hair that gives it tonal hues of blonds and reds.

The Level System

Cosmetic Art Science has developed a way to identify and categorize the lightness or darkness of the color of hair into units of measurement. It is called the level system and is used to identify and put into perspective color density. It is also described as: the amount, concentration or saturation of color.

The Level System

Figure 1 (levels of color)



There are ten units of measurement in the level system. Level 1 is black and level ten is lightest blond. Each unit of measurement, from level one, gets lighter and lighter until it reaches the lightest color labeled as #10 - lightest blond.

The units are as follows: 10.Lightest blond; 9.Very light blond; 8.Light blond; 7.Medium blond; 6.Dark blond; 5.Light brown; 4 Medium brown; 3.Dark brown; 2.Very dark brown; 1.Black

It is important to note that the names given to the 10 degrees of color level can vary among product companies who manufacture color level swatches. The focus here is to identify degrees of color saturation and depth between levels, the degrees of lightness to darkness.

The building block for any color service is the initial analysis of the clients' level of color. Without mastering this step it is impossible to achieve accuracy in predicting the end results. Many hair product manufacturers include color level system swatches to make the job easier. After familiarizing yourself with the color levels you will become less dependent upon using the level system swatches. However, it is the best practice to continue using this tool throughout your entire career as a colorist in order not to inadvertently stray from accuracy of good analysis.

While learning the level system, it is imperative to use swatches otherwise you may develop an altered sense of level recognition. It is similar to a professional singer. Unless the performer practices with an accurately tuned instrument, such as a professionally tuned piano, he is at risk of altering his ability to recognize true and perfect intonation. This is a good example to compare with the professional colorist. Unless you train your eye with an "in tune" instrument, such as color level swatches, you are at risk of failing to develop a strong eye for color level recognition.

None the less it is superb practice to continue using color level swatches as customary practice for each color service no matter how trained your eye. All tools are to be implemented as appropriate to the service being rendered to maintain a level of excellence.

How To Use Color Level Swatches

The primary use of the color level swatch is during the initial client consultation. Later in this study we will discuss at greater length all components of a professional consultation, however for now we will focus on hair color analysis.

First determine the client's natural color level by sectioning the hair into about a half inch square at the crown of the head. Hold it perpendicular to the scalp so that light passes through it. Select the natural color level hair swatch that you think best matches and place it against the strand to compare. You can check the hair at the scalp and throughout the strand by sliding the swatch up and down the strand to see if all parts of the hair strand are within the same level. Once you have determined color level, you will apply other color laws and factors that help in determining the services to be performed.

To develop the plan of service we also need to consider hues.

Color Hues

Also called tones, color hues are what hair color is all about when it comes to chemistry. Tones or hues are colors that we will be studying using the Color Wheel. Without a complete understanding of color hues it is impossible to achieve natural results. The average patron coming into the salon to get their hair colored requires natural colored hair. Very few people, in comparison to the mass majority, want extreme or vivid colors such as green, purple or fire engine red. Most people want an attractive natural hair color. So the goal of creating natural color is a primary basic of color analysis.

We take into consideration the tone of the natural hair and the tones that we will add with hair coloring products in order to achieve the desired results. All tones play a part of the hair coloring equation. Becoming an expert color analyst is only achievable by learning the color wheel, it's tones and the theory behind it.

The Law of Color

Color is described as the property of an object that determines what the eye is perceiving based on how it reflects light. Hair can reflect components that we perceive as brown or blond but contain the colors of red, green, blue and other shades. In certain combinations of these colors, we perceive very dark brown hair. Other combinations of colors we perceive very light blond hair. There are about as many shades and tones as your imagination will allow when it comes to color results. By adding blues and violets we can make the hair appear more ashy, by adding yellows and reds we make the hair appear more warm. Successful hair coloring is primarily the ability to properly add and remove colors. We have many choices regarding hair color. We can add to the natural hair color. We can remove natural hair color, and we can also add and remove at the same time. We can lighten the level and change the tone simultaneously. It is really an amazing art for the well-rounded colorist. Becoming an expert colorist is one of the most important things you can do in the field of Cosmetology. It is one of the most important services offered in the salon today. It is the best way to establish consistent repeat customers who due to the nature of hair growth must book their touch-ups regularly. This in turn, make for strong client-colorist relationships which results in dependable income.

Tonal Value

Here again the need for analyzing comes into play. Once you have established the level of hair color using the level system, now you must determine the different hues that the client's hair contains. Determining levels and tones are the first steps in building the plan for the coloring process. We take the natural color level, the natural color tones, and what the client tells you that she wants the end results to be, and work the equation.

The Basics of Hair Coloring Products and The Law of Color

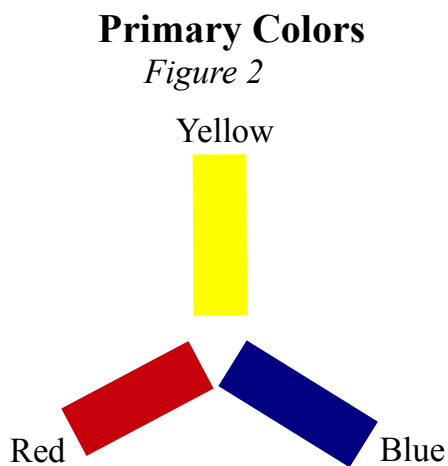
Hair coloring products use primary and secondary colors. All hair coloring products have a base color which is the dominant color contained in the product. Base colors are determined by the product manufacturer with natural results in mind. The colorist will use the laws of color to determine how to use these products. Through the ages several prolific scientists have discovered, theorized and defined what is now considered the laws of color. Whether in reference to an artist's paint on a canvass or a rainbow in the sky, there are certain laws we find in color creation that apply.

For example: always, without fail, **when you combine equal amounts of yellow and blue you will always get green.** **Equal amounts of red and yellow always make orange.** These examples are part of the laws of color and color creation.

Science has found that using the shape of a wheel and placing primary and secondary colors around the wheel in a certain order, they can best dictate color law into a meaningful conclusion.

Let's build a color wheel!

We will start with the primary colors. **Primary colors consist of yellow, red and blue.**



Primary colors are pure colors and can not be formed from combining any other colors. However you can use these colors to make other colors. In fact, **all colors are created from the three primary colors.**

Cosmetic Art Science uses the terms “cool” and “warm”. **If a color has predominately blue tones it is considered to be cool.** If a color has predominately red or yellow tones it is considered to be warm.

This terminology helps in understanding color concepts when mixing hair coloring products. To create a warmer shade, you can add more red. To create a cooler shade, you can add more blue. That would be a very basic rule of thumb however additional color concepts need to be mastered in order to have a complete understanding of hair coloring technology.

For instance, blue is considered the strongest of all the primary colors and the only cool one.

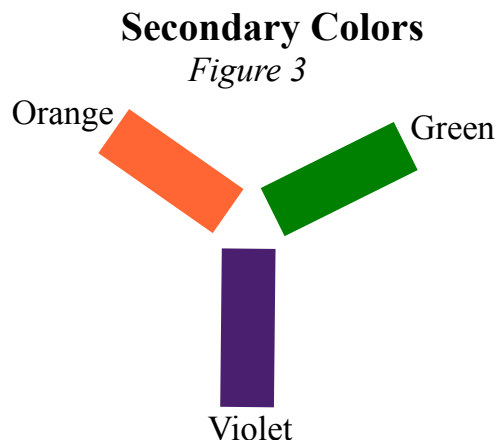
In hair coloring concepts, it is good to know that the color blue can provide depth and darken any color. As for red, it is considered a medium strength primary color.

In hair coloring concepts, it is good to know that adding red to blue based colors makes them lighten. **Red added to yellow based colors makes them darken.**

Yellow is considered the weakest strength of the primary colors. When added to other colors it changes that color to a brighter and lighter appearance.

When the three primary colors (red, blue and yellow) are mixed together in equal parts, the following colors are created: black, gray and white, according to the level used.

When two primary colors are combined, a secondary color is created. There are only three secondary colors. They are green, orange and violet.



Combing equal amounts of blue and yellow make green.
Combing equal amounts of red and yellow make orange.
Combing equal amounts of blue and red make violet.

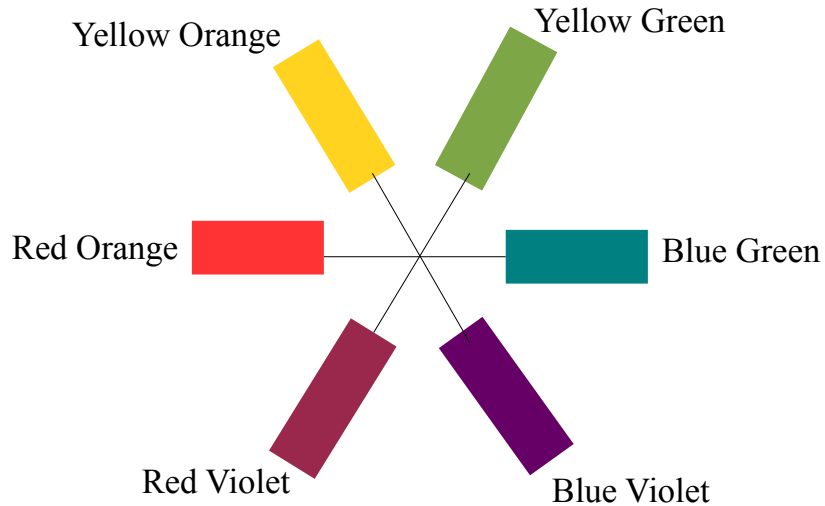
By looking at the color wheel we can see that colors are in a specific order.

Tertiary colors are the colors created when combining equal amounts of a primary color and it's neighboring secondary color on the color wheel.

Tertiary colors are: blue-green, blue-violet, red-violet, red-orange, yellow-orange and yellow-green.

Tertiary Colors

Figure 4

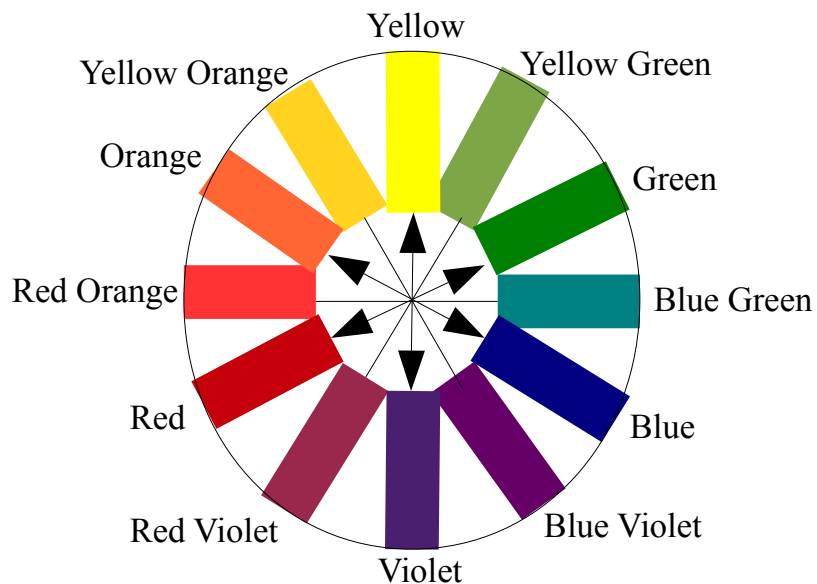


Complementary Colors

Complementary is the term used for primary and secondary colors that are directly opposite each other on the color wheel. Each color's complementary color neutralizes it's tone. For example: to neutralize an over abundance of yellow in the hair, use equal level of it's complementary color violet.

Complementary Colors

Figure 5



Hair Coloring Product Formulation

Cosmetic Art Science defines hair coloring products into two main categories:

Oxidative and Non-oxidative

Oxidative hair coloring products are classified into two groups:

1. Permanent

2. Demi-permanent

Non-oxidative hair coloring products are classified into two groups:

1. Temporary

2. Semi-permanent

Oxidation is when the chemical substances combine with oxygen.

Oxidative hair coloring products are designed using oxidation as a necessary action to achieve hair coloring.

Oxidative hair coloring products consist of a solution that contains dye *intermediates* which when mixed with a developer creates a dye as the chemicals react within the hair shaft.

Also contained in oxidative hair coloring products, are *preformed* dyes. They are included in hair coloring products in predetermined amounts according to the shade that is intended for the formulation.

Hair coloring products also contain soaps, detergents and conditioning agents.

The coloring product is designed to mix with the developer (hydrogen peroxide) right before application to the hair.

The terms hydrogen peroxide and developer are interchangeable and refer to the same additive.

The applied mixture causes the hair to swell, and the dye intermediates and preformed dyes penetrate the hair shaft and then have a chemical reaction. This reaction is what forms the final dye composition that will stain the hair.

Product Overview

Permanent hair coloring products are designed to lift existing color and deposit product color.

Permanent hair coloring products are used in coloring services for the following purposes.

1. To completely change one's hair color

2. To enhance one's natural hair color by brightening it, or darkening it

3. **To cover gray**

Demi-permanent hair coloring products are designed to only deposit product color. They contain coal-tar dyes that adhere to the hair shaft. Demi-permanent hair coloring products are not designed to lighten natural hair.

Demi-permanent hair coloring products are used in coloring services for the following purposes.

1. To refresh previously colored hair that has faded
2. To enhance one's natural hair color
3. To deemphasize gray hair so it blends in better to the overall color of the person's hair
4. To use as a toner to chemically pre-lightened hair
5. To use as a filler for a color correction procedure

Temporary hair coloring products are used in coloring services for the following purposes.

1. To change the hair color temporarily
2. To neutralize an undesired tone

Semi-permanent hair coloring products are used in coloring services for the following purposes.

1. **Can be used as a toner** to pre-lightened hair
2. Can be used when a short-term change is desired, as it generally only lasts from four to six weeks

Semi-permanent hair coloring products are single products. They are not mixed with developers or peroxide. **Demi-permanent hair coloring products are mixed with developers.**

PATCH TEST REQUIRED

Permanent Hair Coloring Products

Permanent hair coloring products are always mixed with a developer.

Using a higher volume of developer creates more lightening results and using a lower volume of developer creates less lightening results.

Simultaneously with the lightening action, color is deposited.

Permanent hair coloring products are very versatile in that they can be used to match, darken, lighten or cover gray.

Aniline derivatives are used in permanent hair coloring products.

Aniline, phenylamine or aminobenzene is an organic compound; $C_6H_5NH_2$.

Any hair coloring product containing aniline dyes requires a patch test 24 to 48 hours before application.

The types of aniline are:

1. aniline oil for blue (pure aniline);
2. aniline oil for red (a mixture of equal parts - aniline and ortho- and para-toluidines);
3. aniline oil for safranin (aniline and ortho-toluidine) Safranin (basic red 2) is a biological stain that colors cell nuclei red.

Colors develop when the aniline derivatives combine with hydrogen peroxide.

The dye is deposited into the cortex of the hair. This is the oxidation process.

Oxidation is defined as: to undergo or cause to undergo a chemical reaction with oxygen.

Historians agree that aniline: was first isolated from the distillation of indigo (a plant-based blue dye such as; used in blue jeans) in 1826. This was done by Otto Unverdorben, who named it crystalline.

However in 1834 Friedlieb Runge isolated aniline using coal tar, which also in turn produced a blue color when lime chloride was added to it.

Aniline from coal tar is still widely used today in hair coloring products.

Over time aniline became greatly used commercially in many products such as plastics and dyes. There is now a giant synthetic dye industry based on aniline dyes.

Hair product manufacturers get their aniline derivatives from these dye companies to use in their hair coloring product lines.

Permanent hair coloring products are the best choice for dyeing gray hair.

Permanent hair coloring products create a permanent change in the hair by lightening the existing natural color by removing color pigments. This is the primary reason that they are called permanent colors – because of permanent removal of natural pigment.

PATCH TEST REQUIRED

Demi-Permanent Hair Coloring Products

Demi-permanent hair coloring products are oxidative. They require a developer. They only deposit color and do not lighten. They are less alkaline than permanent hair coloring products and require a lower volume developer. Many demi-permanent hair coloring products do not use hydrogen peroxide as the oxidizing agent like with permanent hair coloring products. They do contain the same dyes as permanent hair coloring products therefore requiring a patch test.

Demi-permanent hair coloring products do not have the ability to decolorize hair.

These no-lift deposit-only hair coloring products are great for:

- 1.a client's first color service
- 2.blending gray
- 3.to refresh faded permanent color on the mid-area and ends
- 4.restoring natural hair color
- 5.correcting off-tones

On natural hair, they can deepen or change the color.

Demi-permanent color is a great choice for refreshing the hair shaft area and ends when performing a new growth hair color service. It keeps hair coloring build-up to a minimum using this technique.

NO PATCH TEST REQUIRED

Temporary Hair Coloring Products

Temporary hair coloring products are non-oxidative. They do not require a developer. Temporary hair coloring products only coat the hair and are easily shampooed away. No chemical change in the hair occurs.

There are various types of temporary hair coloring products in the marketplace and many new products arriving frequently.

Some of the existing types of temporary hair coloring products are:

- 1.Spray on
- 2.Shampoo
- 3.Liquid / rinse
- 4.Mousse
- 5.Gel
- 6.Mascara / wand

Spray on temporary color products wash out easily with one shampoo. It is used for many looks from subtle to dramatic – from full coverage to streaks and designs. For dramatic designs, stencils can be used. It is fun for the client and the colorist can offer it as a specialty service during the Holidays. Stencils can be purchased or custom made from existing patterns.

Shampoo temporary color products are simply used like normal shampoo. Follow label instructions for best results. The color molecules coat the hair and you can blow-dry and style as usual.

The use of color shampoos is a very popular way to neutralize unwanted brassiness or yellow tones.

Liquid temporary color products, also known as rinses, are applied to freshly shampooed hair. Follow the directions on the label for recommended use for best results. Generally the rinse is applied after shampooing. Many stylists wrap the hair in a towel to blot all excess water.

The hair should not be dripping wet for proper application. The hair must be able to be coated and it can not do so if over-saturated with water. For full coverage, apply beginning at the hairline and comb through to the ends, applying more rinse as needed. Style as desired.

Mousse temporary color products should be used following label directions for best results. Most are designed for either wet or dry hair – full coverage or strategically placed.

Gel temporary color products can be applied the same as customary setting gels. Usually they can be applied to wet or dry hair however read the label for best results.

Mascara temporary coloring products and those that are applied with wands are great when you want perfect placement and control.

They are usually designed for use on dry hair. Of course many eye-lash mascaras are available in many colors, but so are designer hair mascaras.

It's a great way to temporarily color new growth around the hairline. Creative highlights can be perfectly placed using illuminating colors on styled dry hair.

PATCH TEST REQUIRED

Semi-Permanent Hair Coloring Products

Semi-permanent hair coloring products are designed to fade over time. They often last about four to six weeks depending on how many times the hair is shampooed.

Semi-permanent hair coloring products are not mixed with peroxide. They do not lift or lighten the natural hair color and only deposit color.

Semi-permanent hair coloring products require a patch test.

PATCH TESTS ARE NOT INTENDED FOR DIAGNOSIS OR TREATMENT OF HEALTH CONDITIONS

Patch Test

A patch test is also known as a *predisposition* test.

The term predisposition is defined as: the state of being predisposed or susceptible to something, especially to a disease or health problem. In this case it refers to a client being predisposed to being allergic or sensitive to the aniline dye in the hair coloring product.

Therefore to determine whether a client will have a negative reaction, **we must perform the patch test 24 to 48 hours before an aniline hair coloring service.**

To perform a patch test:

1. Choose a testing area either on the inside of the elbow or behind the ear.
2. Wash a small area with a gentle soap, rinse and dry.
3. Mix a small amount of the hair coloring product (use the shade and brand that you intend on using for the service) in the same ratio as a customary application.
4. Using a cotton swab, apply color mixture to the cleaned area.
5. Do not rinse or remove for 24 to 48 hours.
6. After 24 to 48 hours look at the patch test area to determine if there are any signs of inflammation, rash or welts.
7. Record the results on the client's information card.

Developer / Hydrogen Peroxide

The developer is what must be mixed with oxidative hair coloring products in order to create the chemical reaction needed to form and deposit color. Hydrogen peroxide also plays a part in the determination of the amount of lightening natural hair.

Hydrogen peroxide is the oxidizing agent that “develops” the hair coloring product thus called the developer.

When hydrogen peroxide is mixed with oxidative hair coloring products it creates oxygen gas that in turn forms the chemical action that creates color molecules that change the color of hair.

Hydrogen peroxide is available in different concentrations called volumes. The volume indicated on the labeling refers to the concentration. Concentration is also referred to as strength. The stronger the formulation the greater amount of lightening that can be achieved.

Developer is somewhat customizable but there are specific limitations, scientifically speaking.

Most hair coloring product companies design their permanent hair coloring products to use 20 volume developer for normal application. 20 volume peroxide is always used for achieving gray coverage.

Other volumes are used for various color applications.

10 volume is used for deposit-only applications.

30 volume is used when additional lightening is desired.

40 volume is used when maximum lightening is desired.

Hair Lightener / Bleach

Hair lighteners, also known as bleach, work by decolorizing the hair. Bleaching products are designed to use with hydrogen peroxide as the developer. The oxidation process is required to achieve decolorization. When this action happens within the cortex of the hair shaft, it displaces and eliminates the melanin pigment thus decolorizing the hair. You can control the amount of decolorization by choosing the volume of developer and adjusting the processing time the product is left on the hair. Hair lighteners are designed to lift the hair to lighter levels than what permanent hair coloring products can achieve.

Bleaching is a very versatile tool and is used for various purposes.

Lighteners can be:

- used to lighten natural hair
- used to lighten colored hair
- used to lighten isolated parts of the hair
- used alone to achieve a color
- used as the first step to achieve a level and follow with a toner

Decolorization

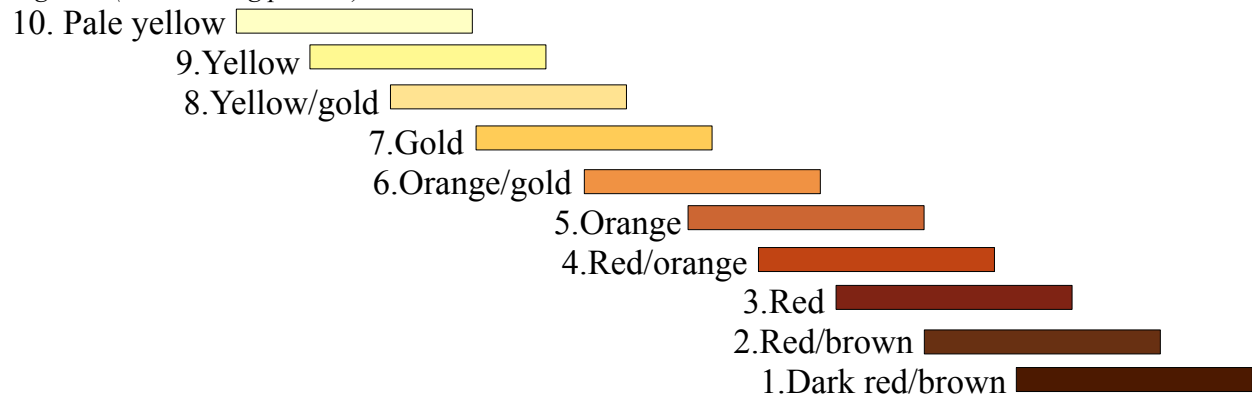
The decolorization process begins immediately upon the application of a prepared lightening product.

The colorist predetermines the level of color that she wants to *remain* in the hair.

There is an invaluable tool for calculating decolorization. It is called the 10 degrees of decolorization.

Degrees of Decolorization

Figure 6 (decolorizing process)



The 10 degrees of decolorization chart is a representation Cosmetic Art Science uses to measure the amount of pigment remaining in the hair throughout the progression of stages of the bleaching process.

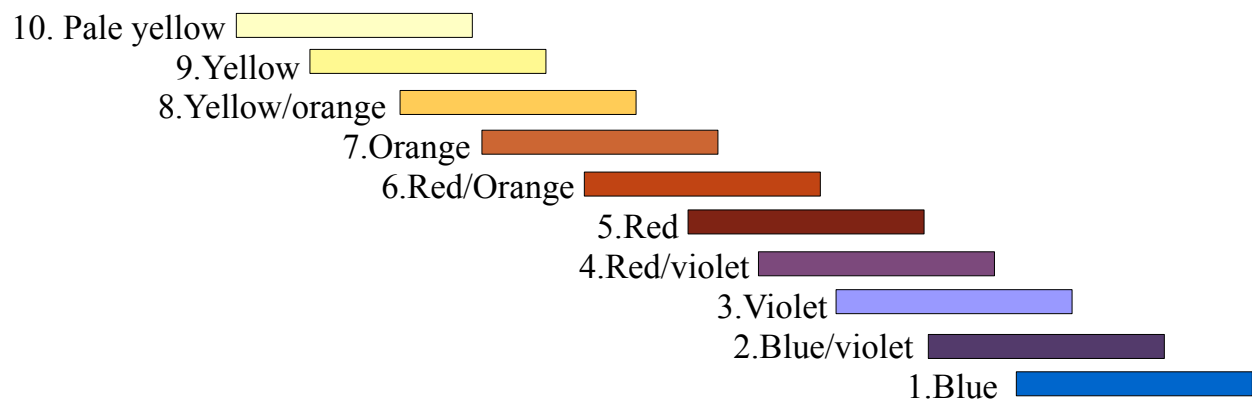
In order to show all possible degrees of decolorization for human hair, the decolorization chart represents that the first degree of lightening for black hair is dark red-brown, and so forth. Hair will of course begin at different levels, but none the less will go through the remaining stages as the decolorization process progresses. Predetermining the final degree of decolorization needed to achieve the desired results of a color service is a key part of pre-planning. Ending the decolorization process at the predetermined degree is crucial.

The amount of existing pigment in natural hair, the strength of the lightener and the amount of processing time all impact the lightening process. Also the temperature of the client and the ambient temperature of the room can also play a part in how fast the hair processes. Oftentimes it has been determined that the warmer a client and room the faster the decolorization process will be.

The natural pigment left in the hair is referred to as contributing pigment or undertones. Cosmetic Art Science has determined the amount of pigments left in the hair for each stage.

Contributing Pigment

Figure 7 (undertones)



It is the undertone and level of the remaining contributing pigment that determines how to tone the lightened hair. It is rather rare to leave bleached hair non-toned. It usually has an unnatural and unappealing appearance. Therefore toners are more often used than not when using lighteners. The more pigment that you can leave in the hair and the less time you leave the product on the hair the healthier and stronger the hair will be at the completion of the color service. That is why the colorist tries to never go lighter than what is needed during the bleaching process.

Also, the colorist should maintain conscious observation of how fast the client's hair is processing.

Sometimes passing through the lower degrees of decolorization may seem to take longer than the higher degrees. Some colorists have observed that after the hair passes through red-orange stage – degrees 4, it tends to progress more rapidly through the remaining degrees.

Severe damage can occur if the hair is processed beyond the pale yellow stage.

Toners can not be accepted into hair that has been bleached beyond the pale yellow stage. Bleach is therefore not designed to bring the hair into a white blond level. Only those who are poorly trained in hair coloring will attempt this irreversible error.

However, toners can easily create the white blond look without over lightening the hair. Instead of removing all pigment, you need only to neutralize the yellow to give a white blond appearance.

Any professional hair coloring product can be used as a toner other than temporary hair coloring. That would include: permanent, semi-permanent, or demi-permanent hair coloring products.

Preliminary Strand Test

Because of the many possible scenarios involving ones hair, such as environmental elements, chemicals, porosity, texture, level of natural color and damage, the only true way to be sure how the color service will turn out is to do a preliminary test strand.

By performing the preliminary strand test, you are never at risk of applying color to an entire head that has had a chemical service, that might not be readily observable, such as an over-the-counter lead-based hair color. If that hair coloring product has been used, then it could prohibit certain salon hair coloring applications.

It could be disastrous if a person was too embarrassed to tell you that he had used an over-the-counter product “for men” and you failed to do a preliminary strand test before performing a color service.

Many of the “for men” products are attractive to men because they color the hair gradually, and they can do it themselves, however the end result is often unnatural and even worse, it can give the hair a metallic appearance with off-color hues such as green. Overlapping that color with a salon application could create an undesired results, therefore a strand test is imperative for a good outcome.

The preliminary strand test is performed before the full color service is given.

You will be performing all hair coloring steps as you would for the complete color service but only using the amount of products needed for the test area; 1/2 inch by 1/2 inch strand. You will record: the formulation used, the processing time and the results of the strand test.

Preliminary Strand Test Procedures

Implements

- ✓ Color swatches and color charts
- ✓ Client record card and pencil
- ✓ Full-coverage water-proof patron cape
- ✓ Towels
- ✓ Comb
- ✓ Color gloves for stylist (keep several pairs ready for use)
- ✓ Plastic hair clips
- ✓ Frosting foils or pre-cut plastic wrap
- ✓ Hair coloring product
- ✓ Developer and measuring spoon
- ✓ Mixing bowl (plastic or glass) and color applicator brush
- ✓ Spray bottle filled with warm water
- ✓ Shampoo
- ✓ Timer

Procedures

- Consult with your client to confirm that nothing has changed since the initial consultation and that she still wants the same service as decided upon in the initial consultation.
- Confirm that there have been no changes in the condition of her hair and scalp.
- Confirm that the patch test is indeed negative
- Confirm the hair coloring application plan and the formulation remains the same as the patch test formulation
- Record this information onto her record card
- Drape the client as appropriate for a wet service
- **Select the hair strand from the back of the head at the lower crown area and part off 1/2 inch by 1/2 inch section**
- Clip the surrounding hair out of the way
- Place selected pre-sized coloring foil or pre-cut plastic wrap underneath the hair strand and secure the foil to the head with plastic clips
- **Mix hair coloring products in the same ratio as for a full service application.** If the hair coloring product calls for equal parts [*color: developer*], for example; 2 ounces of hair coloring product to 2 ounces of hydrogen peroxide; then keep your test mixture in that same ratio. For example: one tablespoon to one tablespoon. Estimate the amount needed for complete coverage of the hair strand.

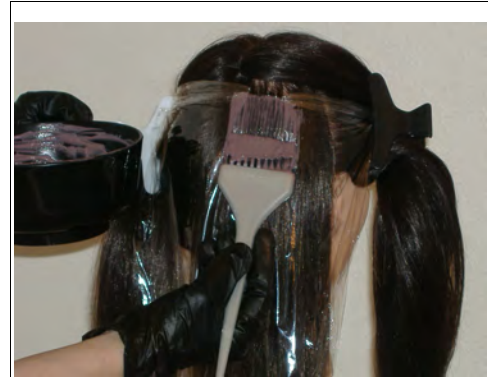


Illustration 1: Preliminary Strand Test

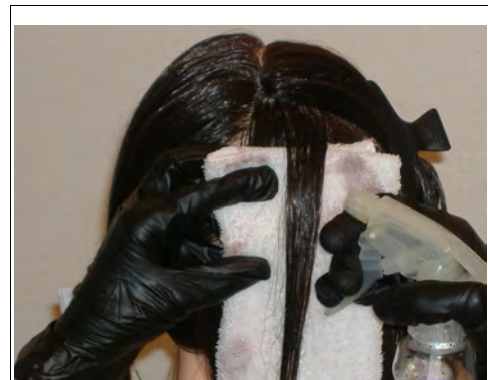


Illustration 2: Using your spray bottle of water, rinse the strand.

- Apply the hair coloring product mixture to the strand and begin timing.
- Every 5 minutes, check how the color is developing
- Upon full development, make a notation on the client's record card of how long you left the color on the hair
- Hold a clean towel placed underneath hair strand and remove the plastic or foil sheet.

Using your spray bottle of water, rinse the strand

- Add a small amount of shampoo to the test strand and shampoo.
- Mist to rinse.
- Towel dry and confirm that it is in fact a good results that would work for the full service.
- If there are any adjustments needed such as adding time, reducing time, changing the shade of the formulation, or application method.
- Make notes onto the record card.

Upon the successful completion of the preliminary strand test you would be ready to complete the full color service.

Let's now review selected permanent hair coloring product applications.

Permanent Hair Coloring Product Applications

Single-process Hair Coloring

When the client wants a single color all over, it is achieved by what is called the single-process application. As indicated, the hair will be processed using one application of hair coloring product.

If the client's hair has never been colored, the first coloring procedure is called a virgin application. The basic virgin application procedures are as follows:

Implements

- ✓ Color swatches and color charts
- ✓ Client record card and pencil
- ✓ **Full-coverage water-proof patron cape**
- ✓ Towels
- ✓ Comb
- ✓ **Color gloves for stylist** (keep several pairs ready for use)
- ✓ Plastic hair clips
- ✓ Hair coloring product and color product tube roller
- ✓ **Developer and measuring container**

- ✓ Color applicator bottle – or if you prefer using a color brush and bowl method gather those items
- ✓ Shampoo and Conditioner
- ✓ Timer
- ✓ Any additional implements listed on the manufacturer's directions, such as a plastic cap, and cotton to cushion the cap, etc.

Preparation

- Check the client's patch test for confirmation that all is well and there is no inflammation or other signs of irritation from the hair coloring product.
- Record patch test analysis onto client's record card.
- Analyze the hair according to porosity, elasticity, texture, etc and record observations onto client's record card.
- Confirm the client's wishes as to the shade desired. Refer back to the color swatches and color charts that show the shades planned.
- Have the client to remove all jewelry and secure the items in her purse or pockets. **All metals and materials are subject to damage when coming in contact with hair coloring products.**
- Drape the client for the hair coloring service.
- Perform a strand test. Record the results onto the client's record card.
- With the client's hair dry, part the hair into **four** sections
- Apply stain prevention cream onto the skin at the hairline area of the forehead, face and neck and around the ears.
- Mix the hair coloring product and developer following the manufacturer's directions

Product Application

- Select the area of the head that you anticipate as being the most resistant to hair color. **Cosmetic Art Science has determined that on most of the population, the area of most resistance to hair coloring is the hairline and temple areas.**
- **Choose the quarter section that you want to begin with.**
- **Using the rat tail of the applicator brush or the tip of the applicator bottle, part the hair into a 1/4th inch subsection.**



Illustration 3: Apply stain protection cream; (single-use cup)



Illustration 4: Part the hair into 1/4" subsection



Illustration 5: Apply color to mid section staying 1/2" away from scalp

- Hold the subsection somewhat perpendicular to the head and apply the hair color mid strand, staying 1/2 inch away from the scalp. Do not apply to the porous ends of the hair yet.

- You will begin processing according to the preliminary strand test results checking for color development along the way.

- Next apply hair coloring mixture to the hair at the scalp, again using the technique of 1/4th inch subsections.

- Next apply color to the ends of the hair by applying and pulling through.

- Upon completion of color processing, at the shampoo bowl, apply warm water and work into a lather, then rinse thoroughly

- Use a towel and shampoo or stain remover to remove any stains on the client's skin

- Shampoo and condition as needed to remove color residue

- Towel dry and style as desired

- Report results onto the client's record card and keep on file

- Dispose of all single-use materials

- Seal containers, wipe them down and properly store them

- Sanitize all implements used per State regulations: to include bottles, bowls, brushes, cape and workstation

- Properly sanitize your hands with adequate soap and water



Illustration 6: Pull color through to ends

Single-process Retouch

After several weeks have gone by since the single-process hair coloring application, the hair will begin to show new growth making it necessary to do a retouch service.

A retouch is defined as: the act of coloring new growth to match the previously colored hair and refreshing the ends that have faded.

With a single-process retouch, you use the same methods of preparation for the client as you did for the original service. You will also perform a consultation, a patch test and a preliminary strand test as customary for a single-process hair coloring service.

Procedures for a Single-Process Retouch

Implements

- ✓ Color swatches and color charts
- ✓ Client record card and pencil
- ✓ Full-coverage water-proof patron cape
- ✓ Towels
- ✓ Comb
- ✓ Color gloves for stylist (keep several pairs ready for use)
- ✓ Plastic hair clips
- ✓ Hair coloring product and color product tube roller
- ✓ Developer and measuring container
- ✓ Color applicator bottle – or if you prefer using a color brush and bowl method gather those items
- ✓ Shampoo and Conditioner
- ✓ Timer
- ✓ Any additional implements listed on the manufacturer's directions, such as a plastic cap, and cotton to cushion the cap, etc.

Preparation

- Check the client's patch test for confirmation that all is well and there is no inflammation or other signs of irritation from the hair coloring product.
- **Record patch test analysis onto client's record card.**
- **Analyze the hair according to porosity, elasticity, texture,** etc and record observations onto client's record card.
- Confirm the client's wishes as to the shade desired. Refer back to the color swatches and color charts that show the shades planned.
- Have the client to remove all jewelry and secure the items in her purse or pockets. All metals and materials are subject to damage when coming in contact with hair coloring products.
- Drape the client for the hair coloring service.
- Perform a strand test. Record the results onto the client's record card.
- With the client's hair dry, part the hair into four sections
- **Apply stain prevention cream onto the skin at the hairline area of the forehead, face and neck and around the ears.**



Illustration 7: Apply stain protection cream; (single-use cup)



Illustration 8: Part the hair into 1/4" subsection

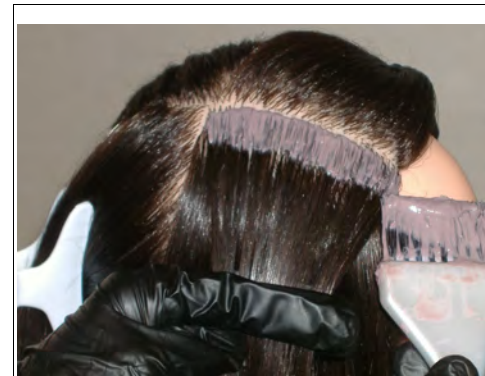


Illustration 9: Apply hair color to the new growth

- **Mix the hair coloring product and developer following the manufacturer's directions**

Product Application

- **Select the area of the head that you anticipate as being the most resistant to hair color.**
- Choose the quarter section that you want to begin with.
- Using the rat tail of the applicator brush or the tip of the applicator bottle, part the hair into a 1/4th inch subsection.
- Hold the subsection somewhat perpendicular to the head and apply the hair color to the new growth only. Do not overlap the color product on previously colored hair.
- You will begin processing according to the preliminary strand test results checking for color development along the way.
- If the ends are greatly faded, you can apply a hair coloring product mixture that is deposit only that will match the newly colored regrowth. If the ends are only slightly faded you can simply rinse the retouch product mixture through to the ends, checking for color results along the way, then rinse.
- Upon completion of color processing, at the shampoo bowl, apply warm water and work into a lather, then rinse thoroughly
- **Use a towel and shampoo or stain remover to remove any stains on the client's skin**
- Shampoo and condition as needed to remove color residue
- Towel dry and style as desired
- Report results onto the client's record card and keep on file
- **Dispose of all single-use materials**
- **Seal containers, wipe them down and properly store them**
- **Sanitize all implements used per State regulations: to include bottles, bowls, brushes, cape and workstation**
- **Properly sanitize your hands with adequate soap and water**

Semi-permanent Hair Coloring

Semi-permanent hair coloring products are applied with a different technique than permanent hair coloring single-process applications. However, you will see similarities in the procedures.

Implements

- ✓ Color swatches and color charts
- ✓ Client record card and pencil
- ✓ Full-coverage water-proof patron cape

- ✓ Towels
- ✓ Comb
- ✓ Color gloves for stylist (keep several pairs ready for use)
- ✓ Plastic hair clips
- ✓ Hair coloring product
- ✓ Color applicator bottle – or if you prefer using a color brush and bowl method gather those items
- ✓ Shampoo and Conditioner
- ✓ Timer
- ✓ Any additional implements listed on the manufacturer's directions, such as a plastic cap, and cotton to cushion the cap, etc.



Illustration 10: Apply stain protection cream; (single-use cup)

Preparation

- Check the client's patch test for confirmation that all is well and there is no inflammation or other signs of irritation from the hair coloring product.
- Record patch test analysis onto client's record card.
- Analyze the hair according to porosity, elasticity, texture, etc and record observations onto client's record card.
- Confirm the client's wishes as to the shade desired.

Refer back to the color swatches and color charts that show the shades planned.

- Have the client to remove all jewelry and secure the items in her purse or pockets. All metals and materials are subject to damage when coming in contact with hair coloring products.
- Drape the client for the hair coloring service.
- Perform a strand test. Record the results onto the client's record card.
- Apply stain prevention cream onto the skin at the hairline area of the forehead, face and neck and around the ears.
- Prepare the hair coloring product



Illustration 11: Part the hair into 1/2" subsection

Product Application

- Select the quarter section that you want to begin with
- Using the rat tail of the applicator brush or the tip of the applicator bottle, part the hair into 1/2 inch partings
- Apply color to the hair closest to the scalp – what would be considered the new growth area of the strand. Apply to all of the scalp area in 1/2 inch partings throughout each section.

- After applying the semi-permanent hair coloring product to all the scalp area in each of the four sections, apply color and pull through to the rest of the hair strands to the ends
- Set your timer to time processing
- If your color product manufacturer requires the use of a plastic cap, follow the instructions for that product
- Upon reaching the desired results, shampoo and condition as needed to remove color residue
- Towel dry and style as desired
- Report results onto the client's record card and keep on file
- Dispose of all single-use materials
- Seal containers, wipe them down and properly store them
- Sanitize all implements used per State regulations: to include bottles, bowls, brushes, cape and workstation
- Properly sanitize your hands with adequate soap and water



Illustration 12: Apply color to hair closest to the scalp



Illustration 13: Apply to all the scalp area in 1/2" partings

There are always new products coming out in the market place for semi-permanent hair coloring products.

The above procedures are the basic customary steps in coloring using a semi-permanent product, however always read the manufacturer's enclosures and labels for best results.

Tips and Solutions

With any type of hair coloring product application, excellent results is always the goal. Knowing approaches for solving color problems and mistakes is invaluable. There seems to be an endless list of bad outcomes that can develop unexpectedly when using hair coloring products. There are many tried and true tips and solutions that we can put into action when problem issues occur.

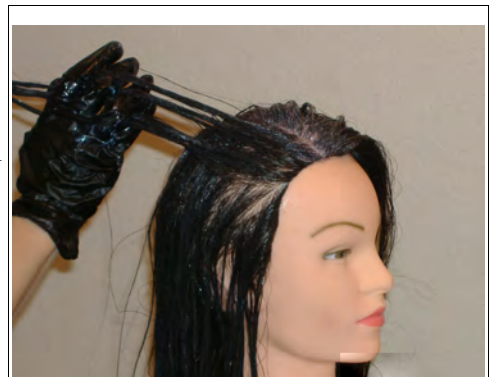


Illustration 14: Pull through to ends

Here a few tips and solutions.

- **Chlorine in swimming pools can cause hair to acquire a green tone.** There are products designed especially for that problem. They are designed to remove mineral buildup. **If you use a mineral buildup remover and the hair still has a green tone, you can apply a no-lift deposit-only hair coloring product to neutralize the green.** Observe the off color and it's undertones to determine which complementary color to use.
- **The hair is *less* likely to turn brassy (orange) when lifting brown hair if a blue based permanent color is used.**
- **If lightening the hair more than 2 levels, you can expect brassy tones and you should be prepared to do a second step toner or glaze that deposits a neutralizing complementary color.**
- If highlights turn out too light, you can use a deposit-only color or glaze to darken the entire head
- If highlights turn out too light you can also choose to create lowlights using foils to weave darkness back into the hair to tone it down.
- **Always use an equivalent ratio of an off color's complementary color to neutralize it. If the main color to be neutralized is a primary color, then use a primary color to neutralize it. If the main color to be neutralized is a secondary color, then use a secondary color to neutralize it.**
- For red hair, if you prefer a more warm coppery red, use a red-orange based color.
- For red hair, if you prefer a more true red, use red to red-violet.
- Only use a deposit-only color to refresh colored hair.
- If the hair turns out too dark, you can use a color remover product on it. Process per the manufacturer's instructions and watch for results. When the hair lifts to the desired level, remove product per manufacturer's instructions.
- Do not mix hair coloring products until you are ready to use them.
- Do not overlap color. It will create a line of demarcation and could also make the hair brittle where it overlaps.

Baliage Highlighting Technique

Baliage or Balayage, is a free-hand or free-form technique of applying lightener.

Using a lightly loaded color brush, you apply a slender line of lightener product mixture to the external layer of dry styled hair. This technique is an excellent way to create subtle highlights especially in all-one-length hair. It touches only the outer layer so it does limit the area in which you will see them. The colorist uses very thin long strokes.



Illustration 15: Baliage highlighting technique

It is usually one of the more affordable hair coloring services available in the modern salon.

Implements

- ✓ Color swatches and color charts
- ✓ Client record card and pencil
- ✓ Full-coverage water-proof patron cape
- ✓ Towels
- ✓ Color gloves for stylist
- ✓ Hair lightener product
- ✓ Color brush and bowl
- ✓ Shampoo and Conditioner
- ✓ Timer

Preparation

- Perform client consultation and hair and scalp analysis and record finding onto the client's record card
- Using shade charts /color swatches and styling books, confirm the client's wishes as to the shade desired and to how many highlights the client desires
- Have the client to remove all jewelry and secure the items in her purse or pockets.
- Drape the client for the hair coloring service.
- Prepare the client's hair – it must be dry and styled before beginning the bialage highlighting technique service .
- Perform a preliminary strand test and record the results onto the client's record card
- Prepare the hair lightener product

Product Application

- Select the area that you want to begin with
- Using a lightly loaded color brush, begin at the top of the head and paint a very slender line from scalp to ends using the edge of the bristles as not to apply too thickly
- Work your way around the entire head according to how many highlights or how few the client desires
- Upon reaching the desired results, shampoo and condition as needed to remove color residue
- Towel dry and style as desired
- Report results onto the client's record card and keep on file
- Dispose of all single-use materials
- Seal containers, wipe them down and properly store them

- Sanitize all implements used per State regulations: to include bottles, bowls, brushes, cape and workstation
- Properly sanitize your hands with adequate soap and water

Temporary Hair Coloring

There are various types of temporary hair coloring products on the market. The formats can vary and include: mascara style, that is applied using a wand applicator, gel, mousse, spray-on, shampoo-in, and color liquids also called color rinse.

The following application outlines the proper procedures using a color rinse. Color rinses are very popular for home or salon use. It's most used when an all-over application is desired.

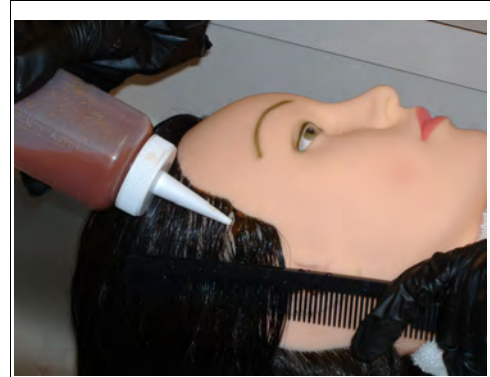


Illustration 16: Temporary hair coloring application

Implements

- ✓ Shampoo cape
- ✓ Towels
- ✓ Comb
- ✓ Gloves
- ✓ Temporary Hair Coloring Product
- ✓ Applicator Bottle
- ✓ Record Card and Pencil

Preparation

Perform a Client Consultation

Have the client to remove all jewelry and store it in her pocket book or pockets

Procedure

- Drape the client for a hair coloring service
- Recline client at shampoo bowl and prepare them for the service
- Shampoo and towel dry the hair
- Read product instructions and shake produce if required before applying
- Apply the color product starting at the hairline and comb throughout hair shafts to ends
- Apply color as needed for coverage over the entire head while combing
- Do not rinse the hair but blot any excess product from the hair with a towel
- Dry and style as desired
- Report results onto the client's record card and keep on file
- Dispose of all single-use materials
- Seal containers, wipe them down and properly store them

- Sanitize all implements used per State regulations: to include bottles, bowls, brushes, cape and workstation
- Properly sanitize your hands with adequate soap and water

This concludes the study of Module 1: Hair Coloring.

Module 2: Health and Sanitation

Outline

Universal Sanitation / Proper Cleaning and Disinfection
The Study of MRSA
OSHA Regulations

Learning objectives:

After completing this lesson you will be able to:

- identify general salon requirements
- identify general sanitation rules and regulations
- describe rules and regulations of proper care of salon products
- define proper disinfection procedures
- describe facts about MRSA
- identify OSHA standards that pertain to matters of safety, health and sanitation

Let's review the practices, principles and theories from the United States Environmental Protection Agency.

The EPA has set Universal Sanitation and Sterilization Rules.

Universal Sanitation

Proper Cleaning and Disinfection

Everything in the salon has either a hard or soft surface. Any surface coming into direct contact with a client's skin is considered contaminated.

All contaminated surfaces must be thoroughly and properly:

- 1) cleaned and then 2) disinfected.

To be considered properly clean, a surface must first be thoroughly scrubbed free of all visible signs of debris or residue. Proper cleaning is the total removal of all visible residue from every surface of tables, tools and equipment, followed by a complete and thorough rinsing with clean water.

Proper cleaning must be performed before continuing with the disinfection step. Proper *disinfection* is the destruction of potentially harmful or infection-causing microorganisms (pathogens) on a pre-cleaned surface.

Disposable (single-use) items

Items that the manufacturer designs to be disposed of after one use are called "disposable" or "single-use". These items must be properly disposed of after one use on a single client. Reusing these items is considered an unsanitary, improper and unprofessional practice.

Some examples of disposable items are: cotton balls, gauze pads, wooden implements, disposable towels, toe separators, tissues, and wooden sticks. Items damaged during the cleaning and disinfecting process are considered single-use and must be discarded after every client.

Proper Product Application

Some types of products can become contaminated if improperly used. Some examples are: creams, lotions, scrubs, paraffin wax, masks, and oils. These products must always be used in a sanitary manner that prevents contamination. For example, paraffin and nail oils should not be applied with a brush (or spatula) that has touched the skin. These practices may introduce bacteria into the product and cause contamination that can render products unsafe for use.

To avoid product contamination always:

- (a) Dispose of used or remaining product between clients.
- (b) Use single-use disposable implements to remove products from containers for application or remove product with a clean and disinfected spatula and put product to be used into a disposable or disinfect-able service cup.
- (c) Use an applicator bottle or dropper to apply the product.

Proper Disinfection of Multi-use Tools and Equipment

Some items are designed to be used more than once and are considered to be “multi-use”. Multi-use items are sometimes referred to as “disinfect-able”, which means that the implement can be properly cleaned and disinfected while retaining its usefulness and quality. Multi-use items are designed for use on more than one client, but require proper cleaning and disinfection between each use. Examples of multi-use items include cloth towels, and manicure bowls. Hard and non-absorbent items constructed of hard materials that do not absorb liquid, like metal, glass, fiberglass or plastic should be cleaned and disinfected as described below.

Individual Client Packs

Tools/instruments kept in individual packs must be properly cleaned and disinfected after each use. State rules require all tools and equipment to be disinfected before being reused, even if used by the same client! Improperly cleaned and disinfected implements may grow infection/disease-causing organisms before the client returns for their next visit, thereby increasing the risk of infection. Never use air-tight bags or containers for storage as these can promote bacterial growth.

Methods of Proper Cleaning

Proper cleaning requires liquid soap/detergent, water and the use of a clean and disinfected scrub brush to *remove all visible* debris and residue. All items should be scrubbed with a clean and disinfected scrub brush under running water. Cleaning is not disinfection; disinfection is an entirely separate step.

Different items are cleaned in different ways. This often depends on what the item is made of and how it was used.

NOTE: the cleaning step must be properly performed before an item can be disinfected. All items must be thoroughly rinsed and dried with clean cloth or paper towels prior to putting them into a disinfectant.

Methods of Proper Disinfecting

After proper cleaning, all reusable implements and tools must be disinfected by complete immersion in an appropriate disinfecting solution.

The item must be completely immersed so that all surfaces, including handles, are soaked for the time required on the disinfectant manufacturer's label. In general, U.S.

Environmental Protection Agency (EPA) registered disinfectants require 10 minute immersion.

Remove items after the required time, using clean and disinfected tongs or gloves to avoid skin contact with the disinfectant solution. If required by the instruction label, rinse thoroughly in running water.

Allow items to air dry completely by placing them on top of a clean towel and covering them with another clean towel.

Methods for Proper Storage

All properly cleaned, disinfected and dried implements must be stored in a sanitary manner.

Appropriate Disinfectants

How do you know if a disinfectant product is suitable for professional salon use?

Standards and requirements vary from country to country, but in the United States, the EPA registered Hospital disinfectants with bactericidal, fungicidal and virucidal claims on the label are best for use in salons.

Disinfectant products are designed to destroy disease-causing microorganisms (pathogens) on non-living surfaces, such as those described in this document. They are not appropriate for use on living skin and contact with skin should be avoided.

Appropriate salon disinfectants include the following:

- (a) EPA-registered Hospital disinfectants with bactericidal, fungicidal and virucidal claims on the label.
- (b) 10% bleach solution (1 part bleach to 9 parts water)

Contact with Blood, Body Fluid or Unhealthy Conditions

If blood or body fluid comes in contact with any salon surface, the nail professional should put on a pair of clean protective, disposable gloves and use an EPA-registered Hospital liquid disinfectant or a 10% bleach solution to clean up all visible blood or body fluid.

Disposable items, must be immediately double-bagged and discarded after use, as described at the end of this section. Any non-porous instrument or implement that comes in contact with an unhealthy condition of the nail or skin, blood or body fluid, must be immediately and properly cleaned, then disinfected using an EPA-registered Hospital disinfectant as directed or a 10% bleach solution.

Any porous/absorbent instrument that comes in contact with an unhealthy condition of the nail or skin, blood or body fluid must be immediately double-bagged and discarded in a closed trash container or bio-hazard box.

Some EPA disinfectants are registered for hospital use, but may not say "Hospital" on their label. In these cases, the product label MUST claim effectiveness against *Salmonella choleraesuis*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa*.

Additional Information about Disinfectants and Cleaners

1) Disinfectants must be mixed, used, stored and disposed of according to manufacturer's label instructions (proper mixing ratio is of the utmost importance to be an effective disinfectant). Some are ready to use and do not require mixing.

2) U.S. Federal Law prohibits the use of EPA-registered disinfectants in a manner that is contrary to its label.

3) Disinfectants must be prepared fresh every day (including spray bottles). Further, they must be replaced immediately if the solution becomes visibly contaminated. Disinfectant solutions will lose their strength upon standing and become ineffective within 24 hours. Use a logbook to record when fresh disinfectant is made.

4) Disinfectants are ineffective if implement/tools are not properly cleaned prior to use.

5) Just spraying disinfectants on tools and equipment is inadequate.

6) Disinfectants can damage or rust some metal tools if improperly used.

7) All disinfectant containers must be properly labeled. Disinfectant solutions prepared in the salon must list on the container: the contents and percentage solution (concentration), and use a logbook to record the date and time of mixing. Check the label for the product's expiration date.

8) All brushes used for cleaning purposes must be properly cleaned and disinfected between each use.

9) Ultra-violet light cabinets are not suitable replacements for liquid disinfectant solutions.

10) Read all warning labels and precisely follow manufacturer's instructions.

These guidelines are believed to be highly effective and are designed to help avoid unforeseen pitfalls, problems and complications. These guidelines are not a replacement for local government standards, rules or regulations. Always consult federal, state and local laws and regulations, which may vary somewhat from these recommendations. Disinfectants used should indicate on the label that they're approved for hospital use. A disinfectant label should clearly show its uses and that it is EPA-approved.

Disinfectants and Antiseptics

Antiseptic is defined as: a substance that inhibits the growth and reproduction of disease-causing microorganisms. For practical purposes, antiseptics are routinely thought of as topical agents, for application to skin and mucous membranes.

Their uses include cleansing of skin and wound surfaces after injury, preparation of skin surfaces prior to injections or surgical procedures, and routine disinfection of the oral cavity as part of a program oral hygiene.

Disinfectant: Any chemical agent used chiefly on inanimate objects to destroy or inhibit the growth of harmful organisms.

Hand Washing

Hand washing, when done correctly, is the single most effective way to prevent the spread of communicable diseases. Good hand washing technique is easy to learn and can significantly reduce the spread of infectious diseases among both children and adults.

What types of disease can good hand washing prevent?

- Diseases spread through fecal-oral transmission. Infections which may be transmitted through this route include salmonellosis, shigellosis, hepatitis A, giardiasis, enterovirus, amebiasis, and campylobacteriosis. Because these diseases are spread through the ingestion of even the tiniest particles of fecal material, hand washing after using the toilet cannot be over-emphasized.
- Diseases spread through indirect contact with respiratory secretions. Microorganisms which may be transmitted through this route include influenza, Streptococcus, respiratory syncytial virus (RSV) and the common cold. Because these diseases may be spread indirectly by hands contaminated by respiratory discharges of infected people, illness may be avoided by washing hands after coughing or sneezing and after shaking hands with an individual who has been coughing and sneezing.
- Diseases may also be spread when hands are contaminated with urine, saliva or other moist body substances. Microorganisms which may be transmitted by one or more of these body substances include cytomegalovirus, typhoid, staphylococcal organisms, and Epstein-barr virus. These germs may be transmitted from person to person or indirectly by contamination of food or inanimate objects such as toys.

What is good hand washing technique?

By rubbing your hands vigorously with soapy water, you pull the dirt and the oily soils free from your skin. The soap lather suspends both the dirt and germs trapped inside and are then quickly washed away.

Follow these four steps to keeping hands clean:

- Wet your hands with warm running water.
- Add soap, then rub your hands together, making a soapy lather. Do this away from the running water for at least 15 seconds, being careful not to wash the lather away. Wash the front and back of your hands, as well as between your fingers and under your nails.
- Rinse your hands well under warm running water. Let the water run back into the sink, not down to your elbows.
- Dry hands thoroughly with a clean towel. Then turn off the water with a clean paper towel and dispose in a proper receptacle.

May I use the over-the-counter alcohol gels for washing my hands instead of using soap and water?

These products, which can be found wherever soap is sold, are very effective at killing germs on the hands as long as your hands are not visibly dirty. They should be used when soap and water are not readily available.

To use correctly, apply about a teaspoonful of the alcohol gel on the palm of one hand. Then rub all over both hands, making sure you rub the front, back, and fingernail areas of both hands. Let the alcohol dry, which should take about 30 seconds. If your hands look dirty but you have no other way to wash your hands, use the gel but wash with soap and water as soon as you can.

Transmission of Pathogens on Hands

Transmission of pathogens from one person to another happens when:

- Organisms present on the patron's skin transfers to the hands of the Salon Professional
- Hand washing or hand antisepsis by the Salon Professional are inadequate or omitted entirely, or the agent used for hand hygiene is inappropriate.
- The contaminated hands of the Salon Professional comes in direct contact with another person, or with an inanimate object that will come into direct contact with a person

Pathogens can be transported from one person to another. The number of organisms present on the skin varies. Persons with diabetes, patients undergoing dialysis for chronic renal failure, and those with chronic dermatitis are more likely to have colonized organisms. We shed microorganisms daily from normal skin onto nightgowns, bed linen, bedside furniture, and other objects in our environment.

Scientific Study of Hand Washing

Investigators use different methods to study hand washing, antiseptic hand wash, and hand antisepsis protocols.

Differences among the various studies include:

- whether hands are purposely contaminated with bacteria before use of test agents,
- the method used to contaminate fingers or hands,
- the volume of hand-hygiene product applied to the hands,
- the time the product is in contact with the skin,
- the method used to recover bacteria from the skin after the test solution has been used, and
- the method of expressing the effectiveness of the product

Despite these differences, the majority of studies can be placed into one of two major categories:

1. studies focusing on products to remove transient flora and
2. studies involving products that are used to remove resident flora from the hands

The majority of studies of products for removing transient flora from the hands involve artificial contamination of the volunteer's skin with a defined test organism before the volunteer uses a plain soap, an antimicrobial soap, or a waterless antiseptic agent.

In the United States, antiseptic hand wash products are regulated by FDA's Division of Over-the-Counter Drug Products (OTC). Products are evaluated by using a standardized method. Tests are performed in accordance with use directions for the test material.

Plain (Non-Antimicrobial) Soap

Soaps are detergent-based products that contain esterified fatty acids and sodium or potassium hydroxide. Their cleaning activity can be attributed to their detergent properties, which result in removal of dirt, soil, and various organic substances from the hands. Plain soaps have minimal, if any, antimicrobial activity. However, hand washing with plain soap can remove loosely adherent transient flora.

Alcohol-based Hand Cleansers

The majority of alcohol-based hand antiseptics contain either isopropanol, ethanol, n-propanol, or a combination of two of these products.

The majority of studies of alcohols have evaluated individual alcohols in varying concentrations.

Alcohols, when used in concentrations present in alcohol-based hand rubs, also have activity against several viruses.

For example, 70% isopropanol and 70% ethanol are more effective than medicated soap or nonmedicated soap in reducing viruses on fingers. Products containing 60% ethanol were also found to reduce the presence of viruses.

Other viruses such as hepatitis A and the polio virus may require 70%--80% alcohol to be reliably inactivated. However, both 70% ethanol and a 62% ethanol foam product with emollients reduced hepatitis A virus on whole hands or fingertips more than nonmedicated soap.

However, depending on the alcohol concentration, the amount of time that hands are exposed to the alcohol, and viral variant, alcohol may not be effective against hepatitis A and other viruses. Alcohol can prevent the transfer some pathogens.

Alcohol-based products are more effective for standard hand washing than soap or antimicrobial soaps.

The effectiveness of alcohol-based hand-hygiene products is affected by several factors, including:

- the type of alcohol used
- concentration of alcohol
- contact time
- volume of alcohol used and
- whether the hands are wet when the alcohol is applied

Frequent use of alcohol-based formulations for hand antisepsis can cause drying of the skin unless emollients, humectants, or other skin-conditioning agents are added to the formulations. The drying effect of alcohol can be reduced or eliminated by adding 1%--3% glycerol or other skin-conditioning agents.

Moreover, in several recent prospective trials, alcohol-based rinses or gels containing emollients caused substantially less skin irritation and dryness than the soaps or antimicrobial detergents tested. These studies, which were conducted in clinical settings, used various subjective and objective methods for assessing skin irritation and dryness. Further studies are warranted to establish whether products with different formulations yield similar results.

Alcohols are flammable. As a result, alcohol-based hand rubs should be stored away from high temperatures or flames in accordance with National Fire Protection Agency recommendations.

Irritant Contact Dermatitis Resulting from Hand-Hygiene Measures

Frequency of Irritant Contact Dermatitis

Frequent and repeated use of hand-hygiene products, particularly soaps and other detergents, is a primary cause of chronic irritant contact dermatitis.

This is of great concern to all Salon Professionals.

The potential of detergents to cause skin irritation can vary considerably. Irritation associated with antimicrobial soaps may be caused by the antimicrobial agent or by other ingredients of the formulation. Affected persons often complain of a feeling of dryness or burning; skin that feels rough or even scaling.

Detergents can damage the skin. Irritant contact dermatitis is more commonly reported with iodophors. Other antiseptic agents that can cause irritant contact dermatitis (in order of decreasing frequency) include chlorhexidine, triclosan, and alcohol-based products. Skin that is damaged by repeated exposure to detergents may be more susceptible to irritation by alcohol-based preparations.

Allergic Contact Dermatitis Associated with Hand-Hygiene Products

Allergic reactions to products applied to the skin may present as delayed type reactions or less commonly as immediate reactions. The most common causes of contact allergies are fragrances and preservatives; emulsifiers are less common causes. Liquid soaps, hand lotions or creams, and may contain ingredients that cause contact allergies.

Allergic contact dermatitis associated with alcohol-based hand rubs is uncommon.

Allergic reactions to alcohol-based products may represent true allergy to alcohol, allergy to an impurity or aldehyde metabolite, or allergy to another constituent of the product.

Proposed Methods for Reducing Adverse Effects of Agents

Potential strategies for minimizing hand-hygiene--related irritant contact dermatitis include reducing the frequency of exposure to irritating agents (particularly detergents), replacing products with high irritation potential with preparations that cause less damage to the skin, and increasing education on hand care.

Hand lotions and creams often contain humectants and various fats and oils that can increase skin hydration and replace altered or depleted skin lipids that contribute to the barrier function of normal skin.

MRSA

Methicillin-Resistant Staphylococcus Aureus

In health news reports, awareness of one particular type of invasive staph infection has come to the forefront. It is called MRSA . It is also known as “the flesh eating disease”. The results of having this disease is often bodily disfigurement. Bodily damage occurs in varying degrees of severity.

An outbreak of “USA300 strain” MRSA: methicillin-resistant Staphylococcus aureus occurred in a Cosmetologist and 2 of her customers. Eight other persons, who were either infected or colonized, were linked to this outbreak, including a family member, a household contact, and partners of customers.

The CA-MRSA USA300 strain is known to cause outbreaks among population groups, such as:

- native Americans,
- prison inmates,
- military personnel,
- men who have sex with men, and
- competitive sports participants,
- and accounts for 97% of MRSA isolates obtained in emergency departments across the United States from patients with soft tissue infections.

CA-MRSA is associated with invasive infections. The USA300 strain, which is also found in Europe was first isolated in the Netherlands in 2002.

Overall prevalence of MRSA in the Netherlands is low (2%).

In 2006, 3.8% of all MRSA isolates sent to the National Institute for Public Health were identified as the USA300 strain.

We report an outbreak of the USA300 strain related to a Beauty Salon in the Netherlands, in a:

- Cosmetologist
- A family member
- A household contact and
- Customers and their partners.

The Study of MRSA

In September 2005, a medical microbiologist from the regional medical microbiology laboratory reported to the municipal health department a recurring MRSA infection in a Cosmetologist. From December 2004 onwards, the woman had recurrent infections on the:

- legs,
- buttocks, and
- groin

resulting in treatment to include incision and drainage of lesions. When an abscess developed in the genital area in July 2005, MRSA was cultured from a wound swab.

In December 2005, the Cosmetologist was declared MRSA-free after antimicrobial treatment.

Swabs were taken 3 times in 1-week intervals from:

- nose,
- throat,
- perineum, and
- wound

and used for enrichment culture of MRSA.

In March 2006, the woman was tested again for MRSA colonization; test results showed that she had been reinfected or that therapy had failed. The Cosmetologist had eczema. Because of the "hands on" nature of her work, she was advised to temporarily stop providing services to customers.

The municipal health department conducted a risk assessment of the woman's household contacts and the Beauty Salon. The Netherlands does not require that MRSA infections be reported. Therefore, the municipal health department depends upon the consent and full cooperation of index patients and contacts for further investigation of outbreaks.

Consequently, in this instance, household contacts for screening were identified but had not presented themselves for screening. Contacts who had complaints sought treatment at the emergency department, where the observant infection control practitioner and microbiologists related them to the MRSA outbreak.

Nurses obtained specimens by swabbing each patient's nose, throat, and wounds. A case was defined as a patient who had a culture-confirmed MRSA infection during the outbreak period July 2005–December 2006 and a direct epidemiologic link to the index patient.

In April 2006, a salon customer was hospitalized with an abscess of the breast caused by MRSA; in July 2006, another customer who had had boils since February 2006 was found to be MRSA positive. Both customers had been given wax treatments by the Cosmetologist during the period in which she had an infected hair follicle in her armpit.

Swabs taken from this site showed that the beautician was infected with the same MRSA strain as before. Concern arose about the risk for infection to customers through:

- instruments,
- materials (wax), or
- contact with other employees.

The index patient and the other 6 employees of the salon regularly provided services to each another.

A nurse and a member of the municipal health department visited the salon in June 2006 to check on hygiene protocols and to advise on preventive measures to reduce risk for further transmission. All working procedures and protocols were investigated, and the salon was advised to clean and disinfect instruments and procedure rooms. More specifically, the health department observed a total waxing procedure performed by the staff.

Ten swabs were taken from:

- used wax,
- wax implements, and
- the treatment room.

All 6 employees were screened and informed about MRSA and the current situation. Arrangements were also made to test 22 regular customers who had received wax treatments by the index patient in the previous 2 months.

In the following weeks, these customers were screened at the municipal health office and informed about MRSA.

Of the 22 regular customers, 21 completed a questionnaire and 19 were actually screened for MRSA by culturing samples from nose and throats.

All employees and the 19 selected regular customers were negative for MRSA colonization. All environmental swabs were also negative for MRSA. It was noted that the 70% alcohol used to disinfect the skin after waxing was diluted with water because customers had complained about the stinging effect of the alcohol on treated skin. Furthermore, it became apparent that after performing waxing treatments the Cosmetologist would touch the waxed skin of customers with ungloved hands to check for remaining hairs. She did not wash her hands after removing the gloves.

During the outbreak investigation, more background information became available from those who were MRSA colonized or infected and who could be indirectly linked to the beautician or her customers. During the week that the first infected customer was identified (in April 2006), another customer was hospitalized with an abscess in the groin. Unfortunately, no culture was taken from this patient. The partner of the second infected customer was also infected with MRSA that was related to an abscess on his leg. By the end of 2006, a MRSA-positive couple was identified as a contact of the second infected customer. In August 2006 another couple was reported to be MRSA positive; both had abscesses on the thighs. Because no further epidemiologic data could be obtained, whether the couple's infection was linked to the beauty salon is not clear.

A total of 45 persons who had been in direct or indirect contact with the beautician were screened for MRSA:

- 3 family members
- 3 roommates
- 11 other persons (including secondary contacts)
- 6 beauty salon employees and
- 22 customers (including regular customers)

Fifteen persons had skin infections and 10 of them were colonized with MRSA

- Cosmetologist
- family member
- roommate
- ex-partner of the roommate
- customers and
- partners of customers

Although skin infections never developed in the Cosmetologist's family members, tests did show MRSA colonization in one of them. The beautician's boyfriend, a native of the United States, had already lived for 2 years in the Netherlands.

Although he had skin lesions, no MRSA was found. The girlfriend of a sport mate who regularly exercised with the partner of a customer was colonized with MRSA at the end of 2006. She had immigrated recently from the United States to the Netherlands, but her first screening test results were negative. The mean age of the patients was 29 years (range 21–40 years).

Eleven people were found to be MRSA positive.

Of these 11:

3 persons with a direct link to the beauty salon (the Cosmetologist and 2 customers)
6 with an indirect link (family member, roommate, ex-partner of roommate, partner of a customer, sport mate of partner of a customer and his partner), and
a couple from whom no epidemiological data could be obtained were infected with the same MRSA strain as the Cosmetologist.

All MRSA isolates were identical and identified as the well-known CA-MRSA USA300 strain. All MRSA isolates had identical susceptibility patterns: resistant to oxacillin (and thus to all β -lactam antimicrobial drugs) and erythromycin, and susceptible to rifampicin, ciprofloxacin, gentamicin, clindamycin, vancomycin, teicoplanin, tetracycline, cotrimoxazole, mupirocin, and fusidic acid.

Conclusions

Outbreaks of CA-MRSA strains have been reported with increased frequency. Several reports involved outbreaks among:

competitive sports participants
military personnel
men who have sex with men
prisoners
native Americans
and drug users

Skin treatments in a beauty salon likely led to MRSA transmission as a result of contact with an infected Cosmetologist.

Unless outbreaks occur in a defined group, MRSA remains undetected in the general population because reporting is not mandatory. Although the prevalence of MRSA in the Netherlands is low, local microbiologic laboratories should report outbreaks, when detected, to the local municipal health department for further investigation. More research is necessary to better understand the risk factors involved in these outbreaks.

To fully comply with safety, health and sanitation standards in the salon, we must also observe federal regulations set by the the United States Department of Labor's Occupational Safety and Health Administration regarding the use, handling and storage of chemicals.

OSHA

How Must Chemicals Be Labeled?

Chemical manufacturers and importers must communicate hazard information to employers by properly labeling containers and material safety data sheets (MSDS).

Chemical manufacturers, importers, and distributors must mark containers of hazardous chemicals with labels, tags, or marked with the identity of the chemical, appropriate hazard warnings, and the name and address of the manufacturer or other responsible party.

Each container must be labeled, tagged, or marked with the identity of hazardous chemicals contained therein, and must show hazard warnings appropriate for employee protection.

The hazard warning can be any type of message, words, pictures, or symbols that provide at least general information regarding the hazards of the chemical(s) in the container and the targeted organs affected, if applicable.

Labels must be legible, in English (plus other languages, if desired), and prominently displayed.

What Are Material Safety Data Sheets, And Why Are They Needed?

The MSDS is a detailed information bulletin prepared by the manufacturer or importer of a chemical that describes

- the physical and chemical properties
- physical and health hazards
- routes of exposure
- precautions for safe handling and use
- emergency and first-aid procedures and control measures

Chemical manufacturers and importers must develop an MSDS for each hazardous chemical they produce or import, and must provide the MSDS automatically at the time of the initial shipment of a hazardous chemical to a downstream distributor or user.

Distributors also must ensure that downstream employers are similarly provided an MSDS. Each MSDS must be in English and include information regarding the specific chemical identity of the hazardous chemical(s) involved and the common names.

In addition, information must be provided on the

physical and chemical characteristics of the hazardous chemical
known acute and chronic health effects and related health information
exposure limits whether the chemical is considered to be a carcinogen
precautionary measures
emergency and first-aid procedures
and the identification (name, address, and telephone number) of the organization responsible for preparing the sheet.

Copies of the MSDS for hazardous chemicals in a given work site are to be readily accessible to employees in that area. As a source of detailed information on hazards, they must be readily available to workers during each work shift. MSDS have no prescribed format.

Any Material Safety Data Sheet Preparation format may be used.

The non-mandatory MSDS form (OSHA 174) also may be used as a guide and a copy can be obtained from OSHA field offices.

Employers must prepare a list of all hazardous chemicals in the workplace. When the list is complete, it should be checked against the collected MSDS that the employer has been sent.

If there are hazardous chemicals used for which no MSDS has been received, the employer must contact the supplier, manufacturer, or importer to obtain the missing MSDS. A record of the contact must be maintained.

What are temporary agency employers required to do to meet HAZCOM requirements?

In meeting the requirements of OSHA's Hazard Communication Standard, the temporary agency employer would, for example, be expected to provide generic hazard training and information concerning categories of chemicals employees may potentially encounter. Host employers would then be responsible for providing site-specific hazard training.

Can MSDS be stored on a computer to meet the accessibility requirements of HAZCOM?

If the employee's work area includes the area where the MSDS can be obtained, then **maintaining MSDS on a computer would be in compliance**. If the MSDS can be accessed only out of the employee's work area, then the employer would be out of compliance.

What are the container labeling requirements under HAZCOM?

Under HCS, the manufacturer, importer, or **distributor is required to label** each container of hazardous chemicals. If the hazardous chemicals are transferred into unmarked containers, these containers must be labeled with the required information, unless the container into which the chemical is transferred is intended for the immediate use of the employee who performed the transfer.

When is the chemical manufacturer required to distribute MSDS?

Hazard information must be transmitted on **Material Safety Data Sheets (MSDS)** that must be distributed to the customer at the time of first shipment of the product. **The Hazard Communication Standard** also requires that MSDS be updated by the chemical manufacturer or importer within three months of learning of "new or significant information" regarding the chemical's hazard potential.

What is considered proper training under the HAZCOM standard?

Employees are to be trained at the time they are assigned to work with a hazardous chemical. The intent of this provision is to have information prior to exposure to prevent the occurrence of adverse health effects. This purpose cannot be met if training is delayed until a later date.

The training provisions of the **HCS** are not satisfied solely by giving employee the data sheets to read. An employer's training program is to be a forum for explaining to employees not only the hazards of the chemicals in their work area, but also how to use the information generated in the hazard communication program.

This can be accomplished in many ways (audiovisuals, classroom instruction, interactive video), and should include an opportunity for employees to ask questions to ensure that they understand the information presented to them.

Training need not be conducted on each specific chemical found in the workplace, but may be conducted by categories of hazard (i/e: carcinogens, sensitizers, acutely toxic agents) that may be encountered by an employee during the course of his duties.

Furthermore, the training must be comprehensible. If the employees receive job instructions in a language other than English, then the training and information to be conveyed under the HCS will also need to be conducted in a foreign language.

Do you need to keep MSDS for commercial products such as Windex and White-Out?

OSHA does not require that MSDS be provided to purchasers of household consumer products when the products are used in the workplace in the same manner that a consumer would use them: when the duration and frequency of use (and therefore exposure) is not greater than what the typical consumer would experience.

This exemption in OSHA regulation is based, however, not upon the chemical manufacturer's intended use of his product, but upon how it actually is used in the workplace.

Employees who are required to work with hazardous chemicals in a manner that results in a duration and frequency of exposure greater than what a normal consumer would experience have a right to know about the properties of those hazardous chemicals.

Is a material safety data sheet (MSDS) required for a non-hazardous chemical?

MSDS that represent non-hazardous chemicals are not covered by the HCS.

OSHA does not require nor encourage employers to maintain MSDS for non-hazardous chemicals. Consequently, an employer is free to discard MSDS for non-hazardous chemicals.

On December 6, 1991, the Occupational Safety and Health Administration (OSHA) promulgated the **Occupational Exposure to Blood Borne Pathogens Standard**.

This standard is designed to protect approximately 5.6 million workers in the health care and related occupations from the risk of exposure to blood borne pathogens, such as the Human Immunodeficiency Virus (HIV) and the Hepatitis B Virus (HBV).

What Is Hazard Communication, And Why Is a Standard Necessary?

Under the provisions of the Hazard Communication Standard, employers are responsible for informing employees of the hazards and the identities of workplace chemicals to which they are exposed.

About 32 million workers work with and are potentially exposed to one or more chemical hazards. There are an estimated 650,000 existing chemical products, and hundreds of new ones being introduced annually. This poses a serious problem for exposed workers and their employers.

Chemical exposure may cause or contribute to many serious health effects such as heart ailments, central nervous system, kidney and lung damage, sterility, cancer, burns, and rashes. Some chemicals may also be safety hazards and have the potential to cause fires and explosions and other serious accidents.

Because of the seriousness of these safety and health problems, and because many employers and employees know little or nothing about them, the Occupational Safety and Health Administration issued the Hazard Communication Standard.

The basic goal of the standard is to be sure employers and employees know about work hazards and how to protect themselves; this should help to reduce the incidence of chemical source illness and injuries.

The Hazard Communication Standard establishes uniform requirements to make sure that the hazards of all chemicals imported into, produced, or used in U.S. workplaces are evaluated, and that this hazard information is transmitted to affected employers and exposed employees.

Employers and employees covered by an OSHA-approved state safety and health plan should check with their state agency, which may be enforcing standards and other procedures at least as effective as, but not always identical to, federal requirements.

Why Is a Written Hazard Communication Program Necessary?

A **written hazard communication** program ensures that all employers receive the information they need to inform and train their employees properly and to design and put in place employee protection programs. It also provides necessary hazard information to employees, so they can participate in, and support, the protective measures in place at their workplaces.

Employers therefore must develop, implement, and maintain at the workplace a written, comprehensive hazard communication program that includes provisions for **container labeling, collection and availability of material safety data sheets, and an employee training program.**

If the workplace has multiple employers on site (for example, a construction site), the rule requires these employers to ensure that information regarding hazards and protective measures be made available to the other employers on site, where appropriate.

In addition, all covered employers must have a written hazard communication program to get hazard information to their employees through labels on containers, MSDS, and training.

The written program does not have to be lengthy or complicated, and some employers may be able to rely on existing hazard communication programs to comply with the above requirements.

The written program must be available to employees, their designated representatives, the Assistant Secretary of Labor for Occupational Safety and Health, and the Director of the National Institute for Occupational Safety and Health.

Material Safety Data Sheets / Identifying Document Content

SECTION I: MANUFACTURER'S NAME AND CONTACT INFORMATION SECTION

Manufacturer's name and address Emergency phone number

II: HAZARDOUS INGREDIENTS/IDENTITY INFORMATION SECTION

Lists hazardous components and safe exposure limits

III: PHYSICAL/CHEMICAL CHARACTERISTICS SECTION

Physical state (gas, liquid, or solid), boiling point, freezing point, vapor pressure, specific gravity

IV: FIRE AND EXPLOSION HAZARD DATA SECTION

Flash point, extinguishing media, special fire fighting procedures, unusual fire and explosion hazards, if any

V: REACTIVITY DATA SECTION

Stability, incompatibility, hazardous decomposition or by-products, if any

VI: HEALTH HAZARD DATA SECTION

Routes of entry/exposure Health hazards Carcinogenicity Signs and symptoms of exposure Medical conditions generally aggravated by exposure

VII: PRECAUTIONS FOR SAFE HANDLING AND USE SECTION

Emergency and First Aid procedures Steps to be taken in case material is released or spilled Waste disposal methods Precautions to be taken in handling and storing

VIII: CONTROL MEASURES

Respiratory protection Ventilation requirements Personal Protective Equipment

The following is a sample of an MSDS.

SAMPLE MSDS

XYZ Company		Material Safety Data Sheet	
I. Product		Claudia's Quick Clean and Shine	
Description		Orange liquid, a phenolic odor	
Other Designations	Distributor	Emergency Telephone Nos	
Non-Porous Surface Sanitizer	XYZ Company 123 Drive City, State, Zip	For Medical Emergencies call (000) 111-2222 Transportation Emergencies call (000) 222-1111	
II. Health Hazard Data		III. Hazardous Ingredients	
Corrosive... First Aid For: Eye Contact... Skin Contact... Inhalation... Ingestion... HMIS Hazard Scale...		<u>Ingredient</u>	<u>Concentration</u>
		<u>Exposure Limit</u>	<u>Worker</u>
	
	
	
IV. Special Protection and Precautions		V. Transportation and Regulatory Data	
Hygienic practices Personal Protection Equipment		Not restricted	
VI. Spill Procedures / Waste Disposal		VII. Reactivity Data	
Spill Procedures Waste Disposal		Stable under normal use	
VIII. Fire and Explosion Data		IX. Physical Data	
Not flammable or explosive		Boiling point Soluble in water	

The following is a copy of an OSHA News Release posted by the Administration.

OSHA News Release

When new information regarding a hazardous chemical is discovered, OSHA releases the information to the public.

HAZARD ALERT April 11th, 2011

Hair Smoothing Products That Could Release Formaldehyde

The Occupational Safety and Health Administration (OSHA) and several State OSHA programs are investigating questions and complaints from hair salon owners and workers about possible formaldehyde exposure from using Brazilian Blowout and other hair smoothing products. Some of these products have been labeled as "formaldehyde-free." Oregon's Occupational Safety and Health Administration, California's Occupational Safety and Health Administration, the Connecticut's Dept of Public Health and several other state agencies have already issued warnings about these products to salon owners, stylists, other salon workers, and clients. This Hazard Alert provides information about OSHA's investigations, the health hazards of formaldehyde, and how to protect workers using hair smoothing products that contain or release formaldehyde.

Recent reports from Oregon OSHA, California OSHA, and now Federal OSHA should alert salon owners and stylists to look closely at the hair smoothing products they are using to see if they contain methylene glycol, formalin, methylene oxide, paraform, formic aldehyde, methanal, oxomethane, oxymethylene, or CAS Number 50-00-0. All of these are names for or treated as formaldehyde under OSHA's Formaldehyde standard. Products containing them can expose workers to formaldehyde; employers who manufacture, import, distribute, or use the products must follow OSHA's formaldehyde standard.

What have OSHA's investigations found?

Federal OSHA and State OSHA programs are investigating complaints from stylists and hair salon owners about exposure to formaldehyde while using GIB LLC dba (doing business as) Brazilian Blowout products and other hair smoothing products. OSHA has found formaldehyde in the air when stylists use hair smoothing products. Some had "formaldehyde-free" on the label or did not list formaldehyde on the product label or in the Material Safety Data Sheet (MSDS).

During one investigation, Federal OSHA's air tests showed formaldehyde at levels greater than OSHA's limits in a salon using Brazilian Blowout Acai Professional Smoothing Solution, even though the product was labeled "formaldehyde-free." In most cases, OSHA found that hair salon owners did not know that a hair smoothing product contained or could expose workers to formaldehyde because manufacturers, importers, and distributors did not include the correct warnings on product information.

California OSHA recently found violations at one importer and distributor, GIB LLC dba Brazilian Blowout, that failed to list formaldehyde as a hazardous ingredient on the MSDS provided to downstream users (e.g., salon owners, stylists) for two products: Brazilian Blowout Acai Professional Smoothing Solution and Brazilian Blowout Professional Brazilian Blowout Solution. The MSDS also did not list the health effects from formaldehyde exposure. The MSDS is required to provide users information about the chemicals in a product, the hazards to workers, and how to use a product safely.

The first reports about formaldehyde in hair smoothing products surfaced when Oregon OSHA investigated a complaint from a hair stylist who had nosebleeds, eye irritation, and trouble breathing while using a Brazilian Blowout product labeled "formaldehyde-free." After testing the product, Oregon OSHA found that the product contained formaldehyde, a chemical that can cause the health problems reported by the stylist. Oregon OSHA tested more than 100 samples of keratin-based hair smoothing products and found formaldehyde levels in some products well above what could legally be labeled as "formaldehyde-free." In addition to the Brazilian Blowout products, Oregon OSHA found that other manufacturers, importers, and distributors of hair smoothing products also had not listed formaldehyde or included hazard information on the label or in the MSDS. Based on these findings, Oregon OSHA published a Hazard Alert and a full report in October 2010. Oregon OSHA also alerted Federal OSHA and State OSHA programs where the products were manufactured, imported, or distributed because the hazard information for the product was not correct and did not meet the requirements of OSHA's Hazard Communication standard or State equivalent).

OSHA continues to work with other agencies (e.g., Food and Drug Administration, National Institute for Occupational Safety and Health) to look at formaldehyde exposures in other salons and to make sure that workers and the public have correct information about these products.

What is formaldehyde and how can it affect my health?

Formaldehyde is a colorless, strong-smelling gas that presents a health hazard if workers are exposed.

You can be exposed to formaldehyde if you breathe it into your lungs, if it gets into your eyes, or if it is contained in a product that gets onto your skin. You can also be exposed accidentally if you touch your face, eat food, or drink after using a product containing formaldehyde without first washing your hands. It can irritate the eyes and nose, and cause coughing and wheezing. Formaldehyde is a "sensitizer," which means that it can cause allergic reactions of the skin, eyes, and lungs such as asthma-like breathing problems and skin rashes and itching. When formaldehyde is in a product that gets sprayed into the eyes, it can damage the eyes and cause blindness. It is also a cancer hazard that is linked to nose and lung cancer.

Formaldehyde is a health hazard, whether in a product or in the air. OSHA's Formaldehyde standard covers employers who use formaldehyde, and products that contain or release formaldehyde. (OSHA has also published a formaldehyde fact sheet

Why do some hair smoothing products expose me to formaldehyde?

Many keratin-based hair smoothing products contain formaldehyde dissolved (and chemically reacted) in water and other ingredients in the product. Because of the way the formaldehyde reacts in these products, some manufacturers, importers, or distributors might list other names for formaldehyde on product information or might claim that the product is "formaldehyde-free." Formaldehyde might be listed as methylene glycol, formalin, methylene oxide, paraform, formic aldehyde, methanal, oxomethane, oxymethylene, or CAS Number 50-00-0. All of these are names for formaldehyde under OSHA's Formaldehyde standard. The bottom line is that formaldehyde can be released from hair smoothing products that list any of these names on the label and workers can breathe it in or absorb it through their skin. Workers can be exposed to formaldehyde during the entire hair straightening process, especially when heat is applied (e.g. blow-drying, flat ironing).

How would I know if the product I'm using could expose me to formaldehyde?

Read the product label and MSDS to determine if they list methylene glycol or any of the other names for formaldehyde listed above. If they do, the product can expose you to formaldehyde. Under OSHA's Hazard Communication standard, salon owners and other employers must have an MSDS for each product used in the salon that contains a hazardous chemical. Employers need to review the MSDSs they receive and make sure they understand the hazards of the products they use in their salon(s). They must also make the MSDSs available to their workers (e.g., stylists) and train all workers using the product about the hazards and how to use it safely. If employers do not receive an MSDS automatically, they should request one. If the MSDS does not look complete (e.g., blank spaces that are not completed) then the employer should request a new one from the manufacturer. If the request does not produce the information needed, then the employer should contact the local OSHA Area Office for assistance in obtaining the MSDS.

Be aware that an MSDS may not contain all of the hazard information required, as initially found in the case of Brazilian Blowout products. In the Oregon case, it was only after a stylist reported health problems while using the products that the investigation began. Workers need to report any health problems they think are from the products they use in the workplace to their employer and employers need to follow up on reports of health problems from workers.

When are manufacturers, importers, and distributors of hair smoothing products required to list formaldehyde as an ingredient in their products?

OSHA requires manufacturers of products that contain or release formaldehyde to include information about formaldehyde and its hazards on the label and in the MSDS.

Formaldehyde must be listed if it is in the product at 0.1% or more (as a gas or in solution) or if the product releases formaldehyde above 0.1 parts of formaldehyde per million parts of air. Salons and other employers that directly import hair smoothing products from other countries have the same responsibilities as a manufacturer under the Hazard Communication standard - they must determine the hazards of the product and develop labels and MSDSs that communicate the hazards to users. These requirements are explained in OSHA's Hazard Communication standard (commonly referred to as the "Worker's Right-to-Know Rule") and OSHA's Formaldehyde standard.

What can I do to reduce exposure to formaldehyde when using formaldehyde releasing hair smoothing/straightening products?

Employers, stylists, and other salon workers should read the product information and MSDSs for the products they buy and use so that they know what chemicals are in them and how to use them safely in the workplace. The best way to control exposure to formaldehyde is to use products that do not list formaldehyde, formalin, methylene glycol, or any of the other names for formaldehyde listed above on the label or in the MSDS. Beauty care companies are now making and selling products that they claim do not contain formaldehyde in the solution. Choosing one of these products might eliminate the risk of formaldehyde exposure. Note that just because a product doesn't list formaldehyde, formalin, or methylene glycol does not mean that it does not contain any other hazardous ingredients.

If salon owners decide to use products that contain or release formaldehyde, then they must follow the requirements in OSHA's Formaldehyde standard. The standard requires that employers test the air to find out the level of formaldehyde present in the air when the product is being used. If the test shows that formaldehyde is present at levels above OSHA's limits (0.75 parts of formaldehyde per million parts (or ppm) of air during an 8-hour work shift or 2 ppm during any 15-minute period), then the employer must:

- Install air ventilation systems in the areas where these products are mixed and used to help keep formaldehyde levels below OSHA's limit and perform regular maintenance to make sure the systems work correctly;
- When possible, require workers to use lower heat settings on blow-dryers and flat irons used during the process;
- Give workers respirators, if needed; train them to use the respirator properly; and meet the other requirements in OSHA's Respiratory protection standard;
- Ensure workers understand the information on a product's label and MSDS;

- Post signs at entryways to any area where formaldehyde is above OSHA's limit to tell workers of the danger and stating that only authorized personnel may enter;
- Tell workers about the health effects of formaldehyde, how to use the product safely, and what personal protective equipment to wear while using the product; and
- Train workers how to safely clean up spills and properly throw products out.

In addition, where the tests show that formaldehyde is present in the air at a level of 0.5 ppm during an 8-hour work shift or 2 ppm during any 15-minute period, then the employer must:

- Get workers the right medical attention (e.g., doctor exams), and
- Test the air periodically to make sure that formaldehyde levels are below OSHA's limits.

Whether or not air tests show formaldehyde levels above OSHA's limits, employers must follow certain parts of the standard if a product contains formaldehyde:

- Give employees appropriate gloves and other personal protective equipment (e.g., face shield, chemical splash goggles, chemical-resistant aprons) and train them on how to use this equipment while mixing and applying the products;
- Explain to workers how to read and understand the information on a product's label and MSDS;
- Make sure the workplace has eye and skin washing equipment if products that contain formaldehyde could be splashed onto the workers' skin or into their eyes;
- Train workers how to safely clean up spills and properly throw products out, and;
- Get workers the right medical attention (e.g., doctor exams) if they develop signs and symptoms of an exposure to formaldehyde or are exposed to large amounts of formaldehyde during an emergency (e.g., a large spill).

Employers must also keep records of the air tests they perform, any medical attention needed by their employees, and respirator fit-testing.

For more information about how to control formaldehyde exposures in hair salons, read Oregon OSHA's hazard alert and Cal/OSHA's Advisory.

How can OSHA help you?

OSHA continues to monitor ongoing inspections that may have nationwide impact to ensure that health hazards and appropriate protections for products containing hazardous chemicals are communicated properly on the labels and MSDS. OSHA developed this webpage to give workers and employers useful, up-to-date information on formaldehyde hazards that might be present when using hair smoothing products that contain or release formaldehyde. Employers and workers should read OSHA's

Formaldehyde Fact Sheet for more information about formaldehyde hazards and how to work with it safely. Contact your local OSHA office if you have any questions about a product that you are using or its MSDS. Hair salon owners can also contact OSHA's free and confidential consultation service to help determine if there are hazards at their workplace. On-site consultations do not result in penalties or citations.

What rights do workers have?

Workers have a right to a safe workplace. The Occupational Safety and Health Act of 1970 (OSH Act) was passed to prevent workers from being killed or seriously harmed at work. The law requires employers to provide their workers with a workplace that is free of potential hazards. The OSH Act created the Occupational Safety and Health Administration (OSHA), which sets and enforces protective workplace safety and health standards. OSHA also provides information, training and assistance to workers and employers. Workers may file a complaint to have OSHA inspect their workplace if they believe that their employer is not following OSHA standards or that there are serious hazards.

- Disclaimer -

This Hazard Alert is not a standard or regulation, and it creates no new legal obligations. It contains recommendations as well as descriptions of mandatory safety and health standards. The recommendations are advisory in nature, informational in content, and are intended to assist employers in providing a safe and healthful workplace. The Occupational Safety and Health Act requires employers to comply with safety and health standards and regulations promulgated by OSHA or by a state with an OSHA-approved state plan. In addition, the Act's General Duty Clause, Section 5(a)(1), requires employers to provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm.

Study the following terms and definitions.

Glossary

Terms and Definitions:

<i>aniline dye</i>	an·i·line [an-l-in] Origin: 1860–65 *any of a large number of synthetic dyes derived from aniline, usually obtained from coal tar.
<i>decolorization</i>	de·col·or·iza·tion [dē-,kəl-ə-rə-'zā-shən] Origin: 1830–40 *the act of displacing and eliminating melanin pigment in the hair
<i>developer</i>	de·vel·op·er [dih-vel-uh-per] Origin: 1825–35 *an agent that when added to an oxidative hair coloring product creates a chemical reaction using oxygen to form color dyes in order to stain hair
<i>eumelanin</i>	eu·mel·a·nin [yoo-mel-uh-nin] *the pigment that is found in natural hair that gives it tonal hues of blacks and browns
<i>hydrogen peroxide</i>	Origin: 1870–75 *a colorless liquid, H ₂ O ₂ , used chiefly as an antiseptic and a bleaching agent
<i>level</i>	lev·el [lev-uhl] Origin: 1300–50 Middle English, variant of livil - plummet line, level, diminutive of lībra balance, scales; for formation *position or status in a scale of values; *amount or degree of progress; stage; *A relative degree, as of intensity or concentration
<i>melanin</i>	mel·a·nin [mel-uh-nin] Origin: 1835–45 *any of a group of pigments present in the hair

oxidation

ox·i·da·tion [ok-si-dey-shuh n]

Origin: 1785–95

*the chemical combination of a substance with oxygen

pheomelanin

*Pheomelanin is the pigment that is found in natural hair that gives it tonal hues of blonds and reds.

primary colors

*the 3 pure colors that can not be created by combining other colors: *yellow, red, blue

secondary colors

*the colors created from combining equal parts of 2 primary colors: *orange, green, violet

tertiary colors

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the colors created when combining equal amounts of a primary color and it's neighboring secondary color on the color wheel:
*yellow-orange, yellow-green, red-orange, blue-green, red-violet, blue-violet

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U.S Food and Drug Administration: www.fda.gov * 10903 New Hampshire Ave Silver Spring, MD 20993-0002 * 1-888-INFO-FDA (1-888-463-6332)

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