Nail Art (8 hours)

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Lesson 1: Anatomy of the Nail (2 hours)

Outline

- Parts of the Nail
- Nail Disorders
- Nail Conditions
- Nail Diseases
- Product Safety

Learning objectives:

After completing this lesson you will be able to:

- list and define the parts of the nail
- identify nail disorders, conditions, and infections
- explain the effects of disorders and conditions
- define white spots, splinter hemorrhages, ingrown nails and fungal infections
- describe germ science
- define pathogenic and non-pathogenic bacteria
- define viral infections
- identify parasites: protozoa helminths and ectoparasites
- explain blood-borne parasites
- describe how nail conditions can cause changes in the nail's appearance
- define contagious disorders
- explain how to protect yourself in a chemical environment
- describe how to reduce inhalation, skin exposure, and accidental swallowing of chemical products
- identify chemical products and symptoms of exposure

Introduction

The purpose of this study is to review nail anatomy, nail conditions and product safety. It is important for the professional manicurist to be aware of all factors relating to the nail and it's surrounding tissues in order to perform nail services in a safe and healthy manor.

The Nail

The nail in it's created form has several functions of the human body. It protects and supports the surrounding tissues of the fingers and toes. Fingernails help us to have more dexterity in our interactions. If we did not have fingernails we would have trouble picking up objects or doing other daily tasks.

Another important function that the nail possesses is that it shows our body's level of health. **The appearance of the nail changes when there are negative health issues going on in our bodies**. This helps physicians to identify certain health issues in their patients.

Another function of the nail is an acquired function. It is cosmetic appearance. As a nation, Americans spend a lot of money on the cosmetic appearance of their nails. Both men and women in modern societies often put significant time and effort into maintaining the appearance and health of their nails.
Nails are created by living skin cells in the fingers and toes. Nails are primarily keratin. Keratin is a type of human protein.

Growth
The nail is created from the matrix area. There is a pattern of nail growth in that new cells are created and followed by more new cells. The nail area, as it progresses toward the free edge contain older and older cells. The cells at the free edge are the oldest cells. Toenails do not grow as fast as the nails of the fingers. Nails also grow according to seasons, for example in the winter, nail growth slows down.

Parts of the Nail:

Cuticle	**the non-living skin that adheres to the nail plate**
Distal Phalanges	the fingertip bones that gives shape to the nail unit and supports the dermis
Eponychium	the skin that covers the newly developing nail plate
Hyponychium	the epidermis under the free edge of the nail plate that forms the water tight seal
Keratin	the hard protein that the matrix produces
Lateral Nail Folds	the sidewall seals along each side of the nail plate
Lunula	the blueish white half-moon shape at the base of the nail, usually most pronounced on the thumb
Matrix	the area under the eponychium, the hidden part of the nail where growth takes place
Nail Bed	the skin beneath the nail plate
Nail Folds	the folds of skin that frame and support the nail on three sides
Nail Plate	the visible part of the nail on fingers and toes made of up of hard keratin
Onychodermal Band	the area between the bed epithelium and the solehorn that bunches together to form a band of delicate tissue - it borders the white free edge under the nail plate.
Proximal Nail fold	the fold nearest the point where the nail attaches.
Solehorn Cuticle	a thin layer of epithelium that attaches to the underside of the nail plate at the free edge and naturally sloughs away as the nail grows

Common Nail Disorders
Medical science places nail disorders into the skin conditions category. Nail disorders make up about 10 % of all skin conditions. Because people are very active with their hands and feet, the nail is highly susceptible to injury and in some cases infection.
The nail will show signs of problems if injured or diseased. It can change shapes as it grows, it can turn different colors and it can also develop dents or ridges.
Change in appearance may indicate a minor health problem. Some changes could indicate a more serious health issue.

White Spots
When the base of the nail is injured, white spots can develop within the nail. The white spots are not harmful and will eventually grow out. This is a very common condition and it reoccurs frequently once they develop. They are most often in the shape of circles or semi-circles.

Splinter Hemorrhages
When blood vessels burst inside the nail bed it can cause what is called splinter hemorrhages. The bleeding or hemorrhaging area runs vertical within the nail and they take on the look of splinters, thus called splinter hemorrhages. This condition is most often caused by trauma to the nail however certain medications and diseases can also cause this condition.

Ingrown Nails
Ingrown nails form at the corner of the nail. The nail most often begins to grow downward and curve into the skin due to repeated pushing or pressure. It happens most often to the large toenail. This condition can be brought about by improperly trimming the nails as well. Tight shoes or improper stance can bring about this condition.
Ingrown nails can be painful and sometimes become infected.

Fungal Infections
Fungal infections can occur to nails of the feet or hands. Fungal infections often cause the end of the nail plate to separate from the nail bed. The nail can become discolored. The top of the nail and the skin at the base of the nail can also become infected and become very painful. **Toenails are more susceptible to fungal infections than fingernails** because of the moist, warm environment. Fungi thrive where moisture and warmth are present. **Fifty percent of all nail disorders are fungal infections.**

Other types of infections can occur in the nail. Some examples of common infections are candida and yeast. Persons whose job keeps their hands wet are more susceptible to this type of infection on their fingernails. Other bodily health issues also raise the level of susceptibility for these infections to occur.

Discoloration and change in nail shape can also occur with this type of infection. Fungal infection of the nail, or onychomycosis, is often ignored because the infection can be present for years without causing any pain. Onychomycosis can also be accompanied by a secondary bacterial or yeast infection in or around the nail plate. Because it is difficult to avoid contact with microscopic organisms like fungi, the toenails are especially vulnerable around damp areas where people are likely to be walking barefoot, such as swimming pools, locker rooms, and showers.

Prevention

- Keep feet and toes clean and inspect them often.
- Keep the feet dry.
- After washing the feet and toes with soap and water, dry thoroughly.
- Wear shower shoes when in public areas such as water parks, pools, spas .
- Change your hosiery more than once daily.
- Trim toenails properly .
- Wear shoes that fit well and are made of materials that allow air exchange.
- Disinfect instruments used to cut nails.
- Don't apply polish to nails suspected of infection

Bacterial Infections

Bacterial infections are recognizable due to the redness and swelling that they cause. The bacteria begins to grow and can cause great pain in the nail skin folds. Bacteria sets up quickly if there is an injury in the nail area or to the skin surrounding the nail. Bacterial infections can cause the nail to turn green.

Germ Science

Bacteriology is the scientific study of bacteria. Bacteria is responsible for some of the most deadly diseases known to man. Diseases such as tuberculosis, typhus, plague, diphtheria, typhoid fever, cholera, dysentery, and pneumonia are all caused by bacterial infections. **Bacteria can live on the hands and nails and can be spread through contact with others or inanimate objects.**

An essential part of preventing the spread of infection in the salon is proper hygiene and sanitation. This includes hand-washing and properly disinfecting implements and surfaces.

Non Pathogenic Bacteria

Non pathogenic means that the bacteria is incapable of causing disease.
Non pathogenic bacteria are harmless.

Pathogenic Bacteria
Pathogenic means that the bacteria does cause disease. Bacteria is capable of causing diseases in humans, in animals, and also in plants.

Viruses
Most infections are caused by either bacteria or viruses.
Influenza is an example of a viral infection. It infects the lungs and is accompanied by fever, cough, and severe muscle aches.

There are three types of influenza
Influenza A - Responsible for regular outbreaks. Influenza A viruses also infect domestic animals like pigs, horses, chickens, ducks and birds.
Influenza B - Often causes sporadic outbreaks of illness, especially in residential communities like nursing homes.
Influenza C - Common but seldom causes disease symptoms.

Viral Infections
Warts are the results of a viral infection. Warts can be found in any portion of the nail area. The nail plate could change shape or be destroyed due to interference of a growing wart. Warts can be painful.

Parasites
A parasite is an organism that lives on or in a host.
There are three main classes of parasites that can cause disease in humans:
Protozoa
Helminths and
Ectoparasites

Protozoa are microscopic, one-celled organisms that can be free-living or parasitic in nature. They are able to multiply in humans and can cause serious infections to develop from just a single organism.

Helminths are large, multi-cellular organisms that are generally visible to the naked eye in their adult stages. Like protozoa, helminths can be either free-living or parasitic in nature.

Ectoparasites
Although the term ectoparasites can include a broad range of blood-sucking arthropods such as mosquitoes, this term is generally used to refer to ticks, fleas, lice, and mites that attach or burrow into the skin.

Blood-borne Parasites
Some parasites can be blood-borne. This means two things:

1.The parasite sometimes can be found in the blood stream of infected people; and
2.The parasite might be spread to other people through exposure to an infected person's blood, for example, by blood transfusion or by sharing needles or syringes contaminated with blood.

Appearance of the Nail
The most common health conditions that change the appearance of the nail:

Condition	Nail Appearance
Anemia	Pale nail beds
Diabetes	Yellowish nails, with a slight blush at the base
Heart Conditions	Nail bed is red
Kidney Disease	Half of nail is pink, half is white
Liver Disease	**White Nails**
Lung Diseases	Yellowing and thickening of the nail, slowed growth rate

The appearance of nails can show the initial sign of the presence or onset of systemic diseases. For example, the pitting of nails and increased nail thickness can be manifestations of psoriasis.

Concavity
Nails that are growing in a concave shape (rounded inward) can be because of an iron deficiency in the person.

Contagious Disorders

Athlete's Foot	**Ringworm of the foot.**
Tinea	Ringworm caused by fungus, a vegetable parasite, that includes symptoms of scaling of the skin.
Tinea Unguium	Ringworm of the nails.

Nail Diseases/Disorders

Agnail	The hangnail.
Beau's Lines	Ridges, corrugations and furrows of the nail.
Eggshell Nail	Very thin nail.
Hematoma Nail	A bruised nail.

Leuconychia	The disorder where there are white spots under the nail plate**.**
Onychatrophia	The atrophy or wasting away of the nail.
Onychauxis	The overgrowth of the nail plate.
Onychia	**Inflammation of the nail.**
Onychocryptosis	An ingrown nail.
Onychocyanosis	When the nail is blue due to poor circulation.
Onychogryposis	When the nail is extremely curved like a claw.
Onychophagy	Nail biting.
Onychophosis	The accumulation of horny layers of epidermis under the nail.
Onychosis	Refers to any nail disease.
Paronychia	The inflammation of tissue due to bacteria around the nail.
Tinea Corporis	Ringworm of the hand.
Tinea Pedia	Ringworm of the foot.
Tinea Unguium	Ringworm of the nail, also known as onychomycosis.

Protecting the Manicurist and Pedicurist
Nail Technicians provide a very important and popular service to clients. There are tens of thousands of licensed professionals across America who perform manicures and pedicures daily in hundreds of salons.

Services include nail care, hand care, foot care, manicures, pedicures, nail polishing and the application of artificial nails.

Technical services require the use of many formulations of key products. These products include dynamic active ingredients and can be hazardous to the health of the professional and to their client if not handled properly and professionally.

The minimization to exposure to these ingredients, especially inhalation, must be the highest level of concern for the salon professional.
Overall, product manufacturers have formulated products to help minimize exposure and have tried to lessen negative health effects for the user and client. When products are used in smaller amounts it can minimize exposure.

Even though manufacturers consider exposure when developing their products, it is the responsibility of the product user to do what is necessary to protect themselves and their clients as much as possible during their use.

Injury can happen if improperly handled. Injury can occur to the eyes, nose and lungs. There can also be allergic reactions and sensitivities to certain products or ingredients that only until after this reaction happens that you are aware that you have an allergy.

The Environmental Protection Agency protects the salon professional and their clients by setting regulations.

Decreasing the Inhalation of Salon Products
An exhaust ventilation system must be in place near all working tables of the manicurist. This is in addition to any air conditioning system or heating system that is a standard modern part of the salon.
We must capture and expel vapors, nail filings and chemical powders and dust away from the clients and manicurists.

Tips for Decreasing Inhalation:
- The use of ceiling exhaust systems
- The use of table exhaust systems that are vented to the outside of the building
- The use of air conditioning systems
- The regular replacement of air filters in your air conditioning and heating systems
- The use of electronic air cleaners
- Not using excessive amounts of products when performing services
- Keeping products in small containers at the work table
- Keeping the work table clear of obstructions so your table exhaust system works optimally
- Keeping containers closed tightly containers when not in use
- Not using bulk product containers while performing a service
- Keeping lids on trash cans, emptying trash cans frequently and replacing liners often
- Wearing a dust mask while transferring products from one container to another

Decreasing Skin Exposure to Salon Products
- Wash hands before and after touching a patron or performing a service
- Wash hands before eating or going to the bathroom
- Wash hands after handling products or product containers
- Wear disposable nitrile gloves
- Replace gloves as soon as they are damaged or compromised in any way
- Keep containers tightly closed
- Do not wear clothing that is too loose and could cause accidents with sleeves or other areas getting caught on equipment
- Not using excessive amounts of products when performing services
- Keeping products in small containers at the work table
- Wearing eye protection and gloves while transferring products from one container to another

Prevention of Accidental Swallowing of Salon Products

- Wash hands every time before eating or drinking.
- Never eat or drink in service areas.
- Do not have food or drinks in service areas.
- Do not have salon products in food areas.
- Keep clear and separate areas for eating and working.

A Clean Environment

- Sanitize the salon.
- Dispose of gloves after each customer.
- Use clean unused towels for each customer.
- Clean implements before disinfecting them.
- Disinfect implements after each customer.
- Never give services to unhealthy nails, broken skin or any other signs of unsafe health.
- Before giving the service wash your patrons hands and/or feet.
- Do not use implements brought by customers
- Do not use razor-type shavers to remove calluses.
- Follow your State Cosmetology Board's rules for proper cleaning and disinfection techniques

Safe Practices for the Manicurist

- Label all containers
- Only dispose of waste in accordance to manufacturers' directions or with State regulations
- Do not use outdated MSDS
- Keep copies of MSDS in a binder for each product in your salon that requires it
- Keep copies of state board rules and regulations
- Be trained concerning OSHA rules.
- No smoking by you or patrons inside the salon building.

Important Facts for the Manicurist

- Wearing gloves keeps manicurists from damaging their nails and skin
- Wearing gloves keeps the skin from absorbing ingredients that could cause harm or irritation or allergic reactions to their hands.
- Solvents can be absorbed very quickly by the hands which can be extremely harmful.
- When solvents damage the skin it causes the damaged area to be more susceptible to further absorption and damage by other harmful products.
- Only nitrile gloves provide sufficient protection due to the fact that many product ingredients can penetrate them.
- Look at the MSDS for instructions on what kind of gloves to wear or contact the distributor of the product.
- Wear dust masks to keep from inhaling dust particles
- Wear dust masks when shaping artificial nails or filing natural nails

- Dust masks are approved by the National Institute for Occupational Safety and Health
- There are specific instructions on how to use themselves
- MSDS will advise on which type of mask is best

Product Ingredients	Symptoms of Overexposure
Acetone nail polish remover and fingernail glue remover	Headache, dizziness, irritation to skin, eyes, and throat
Benzoyl peroxide powder additive for artificial nails	Irritation to eyes, mouth, throat, nose, and lungs, and skin rash
Butyl acetate nail polish	Irritation to skin, eyes, mouth, nose and throat; skin rash, headache, drowsiness and confusion
Butyl methacrylate artificial nails	Irritation to skin, eyes, skin, mouth, nose, and throat, skin rash, and shortness of breath
Camphor nail polish	Irritation to skin, eyes, mouth, nose and throat, nausea, vomiting, diarrhea, headache, dizziness, and in extreme cases of overexposure, uncontrollable muscle contractions
Dibutyl phthalate nail polish, nail hardener	Irritation to eyes, stomach, and upper respiratory system
Ethyl acetate nail polish, fingernail glue	Irritation to skin, eyes, mouth, nose and throat, skin rash and confusion
Ethyl cyanoacrylate fingernail glue	Irritation to skin, eyes, mucous membranes and skin sensitization
Ethyl methacrylate artificial nails	Irritation to skin, eyes, respiratory track and skin sensitization
Formalin nail hardener	Irritation to skin, eyes, nose, throat and respiratory system, and wheezing.

Lesson 1 Summary

We have now reviewed basic information regarding the Anatomy of the Nail. We have discussed parts of the nail, disorders, conditions, diseases and product safety.
Let's now turn our attention to the next topic: Creative Artistry.

Lesson 2: Creative Artistry (2 hours)

Outline

- Nail Art Services
- Color Schemes
- Polish
- French Manicure
- Warm and Cool Colors
- The Color Wheel
- Gems
- Foil Methods
- Striping Tape
- Gold Leafing
- Free-hand Painting
- Types of Brushes
- Parts of the Brush
- Air Brushing

Learning objectives:

After completing this lesson you will be able to:

- describe color as it applies to nail art
- identify methods of creating color schemes
- identify nail free-hand painting
- describe the french manicure and the reverse french manicure
- identify the colors within the warm and cool color pallets
- describe the color wheel and how it applies to nail art
- describe types of nail gems and their application
- identify types of foiling material and methods of application
- define the types and applications of striping tape
- describe types of gold leafing materials and the methods of application
- identify free-hand painting
- identify types of nail art brushes
- identify parts of a brush
- define air brushing

Introduction

The purpose of this study is to review principles and practices of Nail Art to include Nail Services, Nail Art Implements and Nail Art Application Procedures.

As you read the following material, think of how you would apply the previous information to the these services. Ask yourself how each of the following services can be performed safely and in a healthy manner as you review their procedures. Consider how you would evaluate the health of the patron's nails, feet and hands in order to perform the following services.

Creative Artistry

Color schemes
Color schemes are logical combinations of colors of the color wheel. Color schemes are used to create style and appeal. Colors that create a pleasing appearance commonly appear together in color schemes.

A basic color scheme uses two colors that look appealing together. More advanced color schemes involve several colors in combination, usually based around a single color.

For example: fingernails with such colors as **red**, **yellow**, **orange** and light **blue** arranged together on a black background.

Color schemes can also contain different shades of a single color; for example, a color scheme that mixes **different shades of green,** ranging from very light to very dark.

Polish
Traditional colors for nail polish are **red, pink and brown,** but nail polish is manufactured in many colors.

French Manicure
The French manicure is traditionally patterned after the color of natural nails, using a clear, beige or soft pink polish on most of the nail with a white finish at the tips. Reverse French manicures are worn as well but not as often as the traditional French manicure.

Warm and Cool Colors
Warm colors always contain golden undertones.
Cool colors always contain blue undertones.
Nail technicians often use color pallets that stay within the same category. Either all of the colors in the pallet will be cool, or all of the colors in the pallet will be warm.

Most professionals agree that staying within one category creates a more esthetically appealing look. Using colors from opposing categories tends to create a more contrasting look with less cohesiveness in appearance.

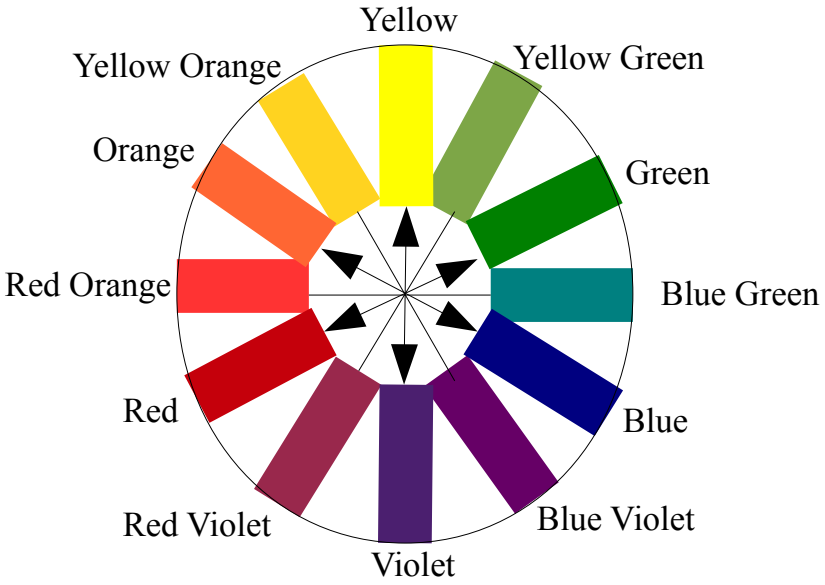
Pallets of color can be created by applying the theory that certain color combinations work well together and appear harmonious.

The word pallet has several definitions. **Pallet is a term for color combinations used by an artist** and it is a term for the actual device that holds the paint while the artist is creating.

The color wheel is an irreplaceable tool in developing color pallets for the most beautiful nail artistry.

The Color Wheel

Figure 1



One method of developing a triad color scheme is to choose three colors equidistant around the hue circle.

The color wheel is one of the best tools in color pallet determination.
Choosing colors of equal depth, in other words, equal levels of pigment, can be a favorable choice when a balanced appearance is desired.

Using contrasting color choices for your pallet can create an appearance of multiple dimensions within the artwork.

Pre-planned color pallets can be presented to the customer.
The choices can range from vibrant colors to muted soft colors.

Choosing the overall background color should be the first step in developing a color pallet.Then choosing a secondary dominate color is usually the next step, then third, fourth, and so on.
Occasionally, the customer may want to match a dominate color in her wardrobe for her background nail color.
On the other hand, neutral and natural nail colorings are popular choices making it completely unnecessary to match any wardrobe colors. In fact, the number one choice in nail color is neutral, natural and beige or light pink tones.

Gems
Tiny gems are manufactured specifically for nail art. They come in various shapes and sizes. They are specifically designed with one side cut flat for attaching to the nail surface.
Apply the gem to the nail with top coat or nail art sealer. **Place sealer on the flat part of the gem so it will adhere to the nail.**
You may also apply the gem with a wooden pusher. First dampen the end of the pusher with the sealer.
Pick up the gem by touching the dampened stick to the colorful side of the gem and place it in the prepared spot on the nail. You can use tweezers as well to do this task.
Press the gem onto the nail and apply a generous amount of sealer to coat it.
Gems can be removed with acetone and can be reused if the gem is in good condition.

Foiling
Foiling is easy and lends opportunity for endless creativity. **Foil comes in rolls and pre-cut pieces in many colors and designs.** Some of the most popular are silver, gold and snake skin. Pre-cut pieces are easy to handle and convenient.

Before applying foil, polish the nail and allow to completely dry. Select the polish color as part of the color scheme.

Apply foil adhesive to the dry nail. Apply the adhesive thinly and evenly. **The adhesive is slightly tinted when wet and becomes clear and tacky when dry**. This tackiness is similar to double sided tape and is developed for easy adhesion to foil.

Foil comes attached to a cellophane base, so when the foil is touched to the tacky nail, it pulls off of the cellophane and adheres to the nail. Wait until the adhesive becomes clear, but do not wait too long or the adhesive will become overly dry and lose it's stickiness.

The timing of the tacky phase is imperative to the success of the service.
There is a shiny side and a matte side to the foil. **The shiny side is always to be facing up and the matte side is to be against the adhesive.**

Foil Methods
Method one is a type of free hand designing. The nail technician pats the cellophane, foil side down, onto the nail. The cellophane is clear after the foil is removed from it, so the technician watches for coverage areas.
The nail technician is careful not to touch the clear portions of the cellophane to the nail. If the nail is touched with the clear portion of the cellophane instead of the foil area, it is possible that the cellophane would stick to the adhesive which could in turn remove the adhesive along with the nail polish.

Method two involves complete coverage. The foil is gently laid on the surface of the nail and a wooden pusher is used to lightly burnish or lightly rub over the cellophane backing, applying the foil to the nail. This is the method used for pre-manufactured foil patterns.

All nail art applications require that you use a final coat of nail art sealer. To apply you must "float the bead". In other words, drop a "bead" or drop of sealant onto the nail and pull the liquid gently to cover the entire nail. Do not brush using pressure as you would polish, but touch the "top" of the bead of dropped sealant and disperse it gently in that manner.

Striping Tape
Striping tape can be applied as the first design application after the nail polish is dry or it can be applied as the last design application when all other design features are in place and are dry.
Striping tape is manufactured in rolls and pages with many colors and sizes. The most used colors are gold, sliver, and black. **Striping tape has a tacky backing.**

Gold Leafing
Leafing material is very thin and fragile. It has a foil-like consistency and is manufactured both in sheets and in loose pieces. Loose gold leafing is also referred to as nuggets and the gold leaf sheets are referred to as nugget sheets.

Leafing sheets are very delicate and must be handled with tweezers or the tissue paper that comes between the sheets in the packaging, otherwise they can crumble or blow away. Usually sheets of leafing come in quantities of 10 to 100 sheets per package. Keep the package closed or the slightest air movement can blow away the product.

The Application Method
Apply nail adhesive to the dry polished nail and allow to become tacky.
Apply the leafing in small amounts using tweezers or a dampened wooden pusher.
When applying a sheet, use the same method as foiling.
When leafing is applied in pieces it appears more like nuggets, and when applied in sheets you get a thin even coverage.
Complete the application with nail art sealer.

Free Hand Painting
Freehand painting is also referred to as flat nail art.
It is when you use nail polish and brushes to create art design on the nail surface.
Brushes
To the artist, the proper choice and quality of brushes and nail color play a crucial part in creating precision designs. Brushes come in many shapes and sizes and many varieties of bristle types. There are firm bristles and soft bristles, slender shapes and thicker shapes. **A complete knowledge of color theory is required to create the most desirable works of art.**

Parts of a Brush
The tip of the brush is the end of the bristles farthest away from the handle. It is also called the edge of the brush.
The mid section of the bristles is called **the belly.** This is where the brush holds the most paint.
The ferrule is the metal band around the brush that helps to hold the bristles in place.
The heel of the brush is the area where the bristles meet the ferrule.

Knowing the parts of the brush is the beginning of understanding why certain brush choices are made to achieve the desired result.

Round brushes have pointed tapered tips and a large belly.
Round brushes vary in their tips making some better for detail work than others.
Softness of the bristles or hairs of the brush determine the amount of control in detail work as well.

Liner brushes are thin and pointed.
They are great for lettering or other fine work requiring detail.
They are best, for example, drawing thin lines and outlining other art applications.

Flat brushes are flexible with long bristles and a square tip.
Another name for a flat brush is shader brush.
It has a flat tip or chiseled edge.
It is used for multi-purposes.
Using the flat of the brush creates smooth strokes.
Each side of the brush can be loaded with different colors to create fade effects. This is called double loading.
The best way to understand it's versatility is to practice designs on art paper to see the limitless creations from this one brush.

Bright brushes are short and flat with very firm bristles.
They are great for creating texture.

Fan brushes are flat brushes in which the bristles are spread out like a fan.
It's a great special effects tool and also can be used for blending. I
t's great for special effects.
When used dry with just a dab of paint on the bristle ends, it can be floated across the top of a design and look similar to air brushing.

Spotter brushes are also called a detailer.
It is short and round with a small belly and a very fine point tip.
It is excellent for the most intricate of detail work.

Striper brushes are very long flat brushes with few bristles.
It's great for creating designs that need long lines or stripes.

The stripette brush also known as the short striper brush is simply a shorter version of the striper brush and it creates the same effects.

The marbleizer brush also known as a stylus comes with wooden handles, a rounded tip and a metal extension. They have rounded ball tips that come in different sizes. They are used for dotting small circles of color such as polka dots or bubbles. A marbleized effect can be created by using different colored paints in a swirl motion similar to the look of marble.

Air Brushing
Airbrushing has become a phenomenally popular salon service.
The technique of color fading can easily be achieved with the airbrush.
Airbrushing is used for the French manicure to achieve the perfect white edge.
A stencil is used to define the shape for the desired end results of the white nail tip.
By using airbrushes and stencils you can easily apply images onto the nail. Pre-cut stencils are readily available at all professional supply stores. **Stencils are made of either plastic, paper or fabric.** You can create your own stencils.

Airbrush Equipment
Airbrushes are usually classified by three characteristics.
The first characteristic is the action performed by the user to trigger the nail color flow.
The second is the mechanism for feeding the nail color into the airbrush.
The third is the point at which the nail color and air mix.

Trigger
The simplest airbrushes work with a single action mechanism where the depression of a single trigger results in nail color and air flowing into the airbrush body and the atomized paint being expelled onto the target surface. Dual action or double action airbrushes separate the function for air and nail color flow so that the user can control the volume of airflow and the concentration of nail color flow through two independent mechanisms.

Technique
Airbrush technique is the freehand manipulation of the airbrush, nail color, air pressure and distance from the surface being sprayed in order to produce a certain predictable result on a consistent basis with or without shields or stencils. Airbrush technique will differ with the type of airbrush being used.Read the manufacturers instructions for operating your airbrush. Practice on paper to become accomplished in technique. See what works and what does not. There are specific practices to master in developing beautiful work. Practice proper aim. Practice on nail tips mounted on wooden sticks. It's a great way to become accustomed to the exact thing of what you are trying to perfect, the nail. Practice painting straight lines, dots and with stencils.

Review The Following Terminology

Nail Art

belly	midsection of the brush bristles; the area that holds the most nail color
color wheel	color guide that illustrates and identifies the primary, secondary, tertiary and complementary colors
double loading	placing two different colors of paint on either side of the brush
floating the bead	technique used to seal nail art where a bead of sealer is dropped onto the nail surface, and the brush floats across the surface and completely covers it with sealer
foil adhesive	special adhesive just for foiling that is generally tinted white or pink and appears cloudy when it is wet
freehand painting	using no stencils or pre-formed patterns, creating art on nails also known as flat nail art
French manicure	airbrushing technique that creates a natural looking nail with a smooth white tip at the free edge
gem	tiny jewel added to a nail design, attached to the nail with adhesive
heel	the part of the brush where the bristles of the brush meet the ferrule
gold leafing	also known as nuggets or nugget sheets, foil like material used to create nail art
marbleizer	also known as stylus, tool with a rounded ball tip and wooden handle use for making dots or small circles
stencil	precut design made of plastic, paper or fabric used to create nail art
striping tape	tacky-backed tape available in various colors; applied over nail polish or other nail art to create bolder designs

Lesson 2 Summary
In this lesson we have discussed facts regarding Creative Artistry, We have reviewed practices of Nail Art Services and have discussed the importance of Color Schemes. We understand methods in polishing, French manicures and have reviewed warm and cool colors. We know the importance of the Color Wheel and have reviewed facts about gems, foil methods, striping tape and Gold Leafing. We have reviewed Free-hand Painting and the types of brushes used. And lastly we have discussed facts about Air Brushing. It is important to continue learning new methods of nail artistry and to also rely on existing methods. We now turn our attention to the next topic: Sanitation and Sterilization.

Lesson 3: Sanitation and Sterilization (2 hours)

Outline

- Standard cleaning and disinfecting precautions
- How to distinguish between disinfectants and antiseptics
- How to sanitize hands and disinfect tools used in the practice of cosmetology
- Bacterial, viral, and fungal control
- Bloodborne pathogens control
- Parasite infection and infestation control

Learning objectives

After completing this lesson you will be able to

- identify cleaning precautions
- describe cleaning routines
- describe the importance of reading labels
- define the term clean
- describe the properties of ideal disinfectants
- identify sterilization
- describe wet disinfection
- define the purpose of infection control
- list safety and sanitation requirements
- describe cleaning and disinfecting procedures
- identify salon environment requirements
- identify CDC infection control guidelines
- describe chlorine based disinfectants
- describe phenol based disinfectants
- describe QAC based disinfectants
- list types of sterilization techniques
- identify lice and infestation

Introduction

In this chapter we will identify standard cleaning and disinfecting precautions, disinfectants and antiseptics, hand sanitation, tool disinfection, bacterial, viral, and fungal control, bloodborne pathogens control, and parasite infection and infestation control.

Standard Cleaning and Disinfecting Precautions

Protect Yourself

We must take precautions and heed the warnings of all labels regarding the handling, use and storage of cleaning chemicals. We will go more into an in-depth study of specific safety issues when we study OSHA regulations later in this course. Just bear in mind that we must observe all safety rules and regulations at all times when preparing, mixing, and applying chemicals. Follow all label instructions without alteration. Only use chemicals deigned for the specific material you are cleaning, otherwise damage may occur.

Protect Your Clients

There are Federal and State Guidelines that the personal service worker must adhere to in order to protect each and every client as well as the salon worker.

How should cleaners and disinfectants be used?
Read the label first. Each cleaner and disinfectant has instructions on the label that tell you important facts:

- How to apply the product to a surface.
- How long you need to leave it on the surface to be effective (contact time).
- If the surface needs to be cleaned first and rinsed after using.
- If the disinfectant is safe for the surface.
- Whether the product requires dilution with water before use.
- Precautions you should take when applying the product, such as wearing gloves or aprons or making sure you have **good ventilation** during application.

Facility Cleaning & Disinfection

Cleaning and disinfection should be performed on surfaces that are likely to contact your patron.

- ***Cleaning surfaces with detergent-based cleaners or Environmental Protection Agency (EPA)-registered disinfectants is effective at removing germs, viruses and fungi from the environment.***
- It is important to read the instruction labels on all cleaners to make sure they are used safely and appropriately.
- Environmental cleaners and disinfectants should not be used to treat the skin
- The EPA provides a list of EPA-registered products

Illustration 1: Cleaning surfaces

Surfaces to Clean

Focus on surfaces that touch people's bare skin each day and any surfaces that could come into contact with people. Clean large surfaces such as floors and walls when they become visibly soiled or on a regular schedule. There is no evidence that spraying or fogging rooms or surfaces with disinfectants will prevent infections more effectively than the targeted approach of cleaning frequently touched surfaces and any surfaces that have been exposed to infections.

Shared Equipment

Shared equipment that comes into direct skin contact should be cleaned after each use and allowed to dry. Salon equipment, and protective gear, should also be cleaned according to the equipment manufacturers' instructions to make sure the cleaner will not harm the item.

Cleaning Keyboards and other Difficult Surfaces

Many items such as computer keyboards or handheld electronic devices may be difficult to clean or disinfect or they could be damaged if they became wet. If these items are touched by many people during the course of the day, a cleanable cover/skin could be used on the item to allow for cleaning while protecting the item. Always check to see if the manufacturer has instructions for cleaning.

Laundry
Routine laundry procedures, detergents, and laundry additives will all help to make clothes, towels, and linens safe to wear or touch. If items have been contaminated by infectious material, these may be laundered separately, but this is not absolutely necessary.

Proper Water Temperature for Laundry

Read and follow the clothing and soap or detergent label instructions. Water temperatures for laundry depend on the type of fiber or fabric. In general, wash and dry in the warmest temperatures recommended on the fabric label. Also, some laundry detergents are made to clean best at certain temperatures. Not following instructions could damage the item or decrease the effectiveness of the detergent.

Using Bleach for Laundry

Use of bleach as a disinfectant in laundering is optional, and not all fabrics are suitable for bleach. Read the label instructions.

Routines

- Facilities should always be kept clean.
- Review cleaning procedures and schedules with the staff.
  - ❍ Cleaning procedures should focus on commonly touched surfaces and surfaces that come into direct contact with people's bare skin each day.
  - ❍ Cleaning with detergent-based cleaners or Environmental Protection Agency (EPA)-registered detergents/disinfectants will remove bacteria from surfaces.
  - ❍ Cleaners and disinfectants, including household chlorine bleach, can be irritating and exposure to these chemicals has been associated with health problems such as asthma and skin and eye irritation.
    - ❒ Take appropriate precautions described on the product's label instructions to reduce exposure. Wearing personal protective equipment such as gloves and eye protection may be indicated.
  - ❍ Follow the instruction labels on all cleaners and disinfectants, including household chlorine bleach, to make sure they are used safely and correctly.
    - ❒ Some key questions that should be answered by reading the label include:
      - ❒ How should the cleaner or disinfectant be applied?
      - ❒ Do you need to clean the surface first before using the disinfectant (e.g., precleaned surfaces)?
      - ❒ Is it safe for the surface? Some cleaners and disinfectants, including household chlorine bleach, might damage some surfaces (e.g., metals, some plastics).
      - ❒ How long do you need to leave it on the surface to be effective (i.e., contact time)?
      - ❒ Do you need to rinse the surface with water after using the cleaner or disinfectant?
  - ❍ If you are using household chlorine bleach, check the label to see if the product has specific instructions for disinfection.
  - ❍ Environmental cleaners and disinfectants should not be put onto skin or wounds and should never be used to treat infections.

- Repair or dispose of equipment and furniture with damaged surfaces that do not allow surfaces to be adequately cleaned.

How to distinguish between disinfectants and antiseptics, How to sanitize hands and disinfect tools used in the practice of cosmetology, Bacterial, viral, and fungal control, Bloodborne pathogens control, and Parasite infection and infestation control

First, let's review disinfectants

What's the difference between cleaners, sanitizers, and disinfectants?

- **Cleaners or detergents** are products that are used to remove soil, dirt, dust, organic matter, and germs (like **bacteria, viruses, and fungi**). Cleaners or detergents work by washing the surface to lift dirt and germs off surfaces so they can be rinsed away with water. The same thing happens when you wash your hands with soap and water or when you wash dishes. Rinsing is an important part of the cleaning process. Use these products for routine cleaning of surfaces.
- **Sanitizers** are used to reduce **germs** from surfaces but not totally get rid of them. Sanitizers reduce the germs from surfaces to levels that are considered safe.
- **Disinfectants** are chemical products that **destroy or inactivate germ**s and prevent them from growing. Disinfectants have no effect on dirt, soil, or dust. Disinfectants are regulated by the U.S. Environmental Protection Agency (EPA).

CDC – Infection Control Guidelines
The Centers for Disease Control and Prevention (CDC) have developed Guidelines for Disinfection and Sterilization.

They provide the following information:

Cleaning is the removal of foreign material (e.g., soil, and organic material) from objects and is normally accomplished using water with detergents or enzymatic products. Thorough cleaning is required before high-level disinfection and sterilization because inorganic and organic materials that remain on the surfaces of salon implements and equipment interfere with the effectiveness of disinfection and sterilization.
Also, if soiled materials dry, the removal process becomes more difficult and the disinfection or sterilization process less effective or ineffective.
With manual cleaning, the two essential components are friction and soap/detergents and water.
Friction (e.g., rubbing/scrubbing the soiled area with a brush) is an old and dependable method.
Soap/detergents and water is used to remove soil and debris.

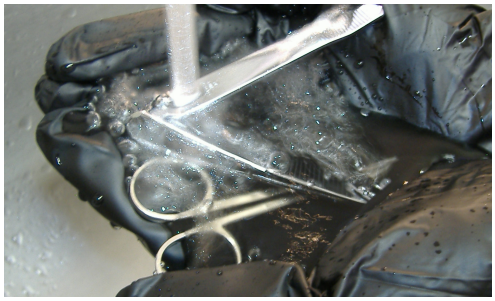


Illustration 2: Wash with soap and water

Disinfection
Many chemical disinfectants are used alone or in combinations. These include chlorine and chlorine compounds, phenolics, and quaternary ammonium compounds. Commercial formulations based on these chemicals are considered unique products and must be registered with EPA or cleared by FDA. In most instances, a given product is designed for a specific purpose and is to be used in a certain manner. Therefore, users should read labels carefully to ensure the correct product is selected for the intended use and applied efficiently.

Disinfectants are not interchangeable, and incorrect concentrations and inappropriate disinfectants can result in excessive costs. Because occupational diseases have been associated with use of several disinfectants such as chlorine, precautions (e.g., gloves and proper ventilation) should be used to minimize exposure.
Asthma and reactive airway disease can occur in sensitized persons exposed to any airborne chemical, including germicides.

Clinically important asthma can occur at levels below ceiling levels regulated by OSHA (Occupational Safety and Health Administration) or recommended by NIOSH (the National Institute for Occupational Safety and Health).

The following is information that can be used to select an appropriate disinfectant for any item and use it in the most efficient way.

Properties of an ideal disinfectant

- Broad spectrum: should have a wide antimicrobial spectrum
- Fast acting: should produce a rapid kill
- Not affected by environmental factors: should be active in the presence of organic matter (e.g., blood, sputum, feces) and compatible with soaps, detergents, and other chemicals encountered in use
- Nontoxic: should not be harmful to the user or patron
- Surface compatibility: should not corrode instruments and metallic surfaces and should not cause the deterioration of cloth, rubber, plastics, and other materials
- Residual effect on treated surfaces: should leave an antimicrobial film on the treated surface
- Easy to use with clear label directions
- Odorless: should have a pleasant odor or no odor to facilitate its routine use
- Economical: should not be prohibitively high in cost
- Solubility: should be soluble in water
- Stability: should be stable in concentrate and use-dilution
- Cleaner: should have good cleaning properties
- Environmentally friendly: should not damage the environment on disposal

Barbicide

Barbicide is a disinfectant solution used by barbers and cosmetologists for sterilizing grooming tools such as combs and hair-cutting shears. Manufactured by King Research, it was invented in 1947 by Maurice King and marketed heavily around the United States by his brother James.

Illustration 3: Barbicide jar

Barbicide is a United States Environmental Protection Agency approved combination germicide, pseudomonacide, fungicide, and a viricide effective against the HIV-1 virus (AIDS virus), Hepatitis B, and Hepatitis C. Its active ingredient is Alkyl dimethyl benzyl ammonium chloride (5.12% by volume); sodium nitrite and blue dye are also present. Contact can cause irritation to the skin and eyes, and consumptionof 50 mL can cause shock and may lead to death if not treated quickly.

Barbicide is sold as a concentrate diluted for use in a 1:32 ratio with water, with each stylist having a container for treating their own tools. At one time, several US states legally required barber shops to use Barbicide; according to the maker two still did in 1997. A jar of Barbicide sits on display in the Smithsonian Institution's National Museum of American History.

Chlorine and Chlorine Compounds

Illustration 4: Bleach

Hypochlorites, the most widely used of the chlorine disinfectants, are available as liquid (e.g., sodium hypochlorite) or solid (e.g., calcium hypochlorite).
The most prevalent chlorine products in the United States are aqueous solutions of 5.25%–6.15% ***sodium hypochlorite, usually called household bleach***. They have a broad spectrum of antimicrobial activity, do not leave toxic residues, are unaffected by water hardness, are inexpensive and fast acting, remove dried or fixed organisms and biofilms from surfaces, and have a low incidence of serious toxicity. Sodium hypochlorite at the concentration used in household bleach (5.25-6.15%) can produce ocular irritation or oropharyngeal, esophageal, and gastric burns. Other disadvantages of hypochlorites include corrosiveness to metals in high concentrations (>500 ppm), inactivation by organic matter, discoloring or "bleaching" of fabrics, and the ***release of toxic chlorine gas when mixed with ammonia or other household cleaning agents.***

EPA has determined the currently registered uses of hypochlorites will not result in unreasonable adverse effects to the environment.

Phenols

Illustration 5: Lysol concentrate

Phenol has occupied a prominent place in the field of disinfection since its initial use as a germicide by Lister in his pioneering work on antiseptic surgery. In the past 30 years, however, work has concentrated on the numerous phenol derivatives or phenolics and their antimicrobial properties. Phenol derivatives originate when a functional group (e.g., alkyl, phenyl, benzyl, halogen) replaces one of the hydrogen atoms on the aromatic ring. Two phenol derivatives commonly found as constituents of disinfectants are *ortho*-phenylphenol and *ortho*-benzyl-*para*-chlorophenol. The antimicrobial properties of these compounds and many other phenol derivatives are much improved over those of the parent chemical. Phenolics are absorbed by porous materials, and the residual disinfectant can irritate the skin.

Examples of phenol disinfectant cleaners are Pine-Sol and Lysol.

Microbicidal Activity of Phenols
Published reports on the antimicrobial efficacy of commonly used phenolics showed they were bactericidal, fungicidal, virucidal, and tuberculocidal at their recommended use-dilution.

Quaternary Ammonium Compounds
Quaternary Ammonium Compounds (QACs) are a type of chemical that is used to kill bacteria, viruses, and mold. QACs are widely used as disinfectants. The quaternaries are good cleaning agents, but high water hardness and materials such as cotton and gauze pads can make them less microbicidal because of insoluble precipitates or cotton and gauze pads absorb the active ingredients, respectively .

Illustration 6: Quaternary disinfectant

Examples of QAC products are Lysol Spray and Clorox Disinfectant Spray.

Microbicidal Activity of QACs
Results from manufacturers' data sheets and from published scientific literature indicate that the quaternaries sold as hospital grade disinfectants are generally fungicidal, bactericidal, and virucidal against most viruses.

Salon Computer Keyboards
Quaternary ammonium compounds (as well as 70% isopropyl alcohol, phenolic, and a chlorine-containing wipes effectively (>95%) remove and/or inactivate contaminants from computer keyboards with a 5-second application time. No functional damage or cosmetic changes occurred to the computer keyboards after 300 applications of the disinfectants.

EPA and FDA
In the United States, chemical germicides formulated as sanitizers, disinfectants, or sterilants are regulated in interstate commerce by the Antimicrobials Division, Office of Pesticides Program, EPA, under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1947, as amended .
Under FIFRA, any substance or mixture of substances intended to prevent, destroy, repel, or mitigate any pest (including microorganisms but excluding those in or on living humans or animals) must be registered before sale or distribution.
To obtain a registration, a manufacturer must submit specific data about the safety and effectiveness of each product. For example, EPA requires manufacturers of sanitizers, disinfectants, or chemical sterilants to test formulations by using accepted methods for microbiocidal activity, stability, and toxicity to animals and humans.
The manufacturers submit these data to EPA along with proposed labeling. If EPA concludes the product can be used without causing "unreasonable adverse effects," then the product and its labeling are registered, and the manufacturer can sell and distribute the product in the United States.

Sterilization
Sterilization destroys all microorganisms on the surface of an article or in a fluid to prevent disease transmission associated with the use of that item. The use of inadequately sterilized items represents a high risk of transmitting pathogens.
The concept of what constitutes "sterile" is measured as a probability of sterility for each item to be sterilized.
This probability is commonly referred to as the sterility assurance level (SAL) of the product and is defined as the probability of a single viable microorg anism occurring on a product after sterilization. SAL is normally expressed a 10.
For example, if the probability of a spore surviving were one in one million, the SAL would be 10^{-6}. In short, a SAL is an estimate of lethality of the entire sterilization process and is a conservative calculation.

Liquid Chemicals
Several FDA-cleared liquid chemical sterilants include indications for sterilization of implements. The indicated contact times range from 3 hours to 12 hours. These solutions are commonly used as high-level disinfectants when a shorter processing time is required.

Ultraviolet Radiation (UV)

UV radiation has been used in the disinfection of drinking water, air, and contact lenses. Bacteria and viruses are more easily killed by UV light than are bacterial spores.

The wavelength of UV radiation ranges from 328 nm to 210 nm (3280 A to 2100 A). Its maximum bactericidal effect occurs at 240–280 nm. Mercury vapor lamps emit more than 90% of their radiation at 253.7 nm, which is near the maximum microbicidal activity. Inactivation of microorganisms results from destruction of nucleic acid through induction of thymine dimers.

Illustration 7: UV Sterilizer

Hand-hygiene

Washing hands at key times with soap and water is one of the most important steps you can take to get rid of germs and avoid spreading germs to those around you.

Illustration 8: Washing hands

How can washing your hands keep you healthy?

Germs can get into the body through our eyes, nose, and mouth and make us sick.

Handwashing with soap removes germs from hands and helps prevent sickness. Studies have shown that handwashing can prevent 1 in 3 diarrhea-related sicknesses and 1 in 5 respiratory infections, such as a cold or the flu.

Handwashing helps prevent infections for these reasons:

People often touch their eyes, nose, and mouth without realizing it, introducing germs into their bodies. Germs from unwashed hands may get into foods and drinks when people prepare or consume them. Germs can grow in some types of foods or drinks and make people sick. Germs from unwashed hands can be transferred to other objects, such as door knobs, tables, or toys, and then transferred to another person's hands.

What is the correct way to wash your hands?

1. Wet your hands with clean running water (warm or cold) and apply soap.
2. Lather your hands by rubbing them together with the soap.
3. Scrub all surfaces of your hands, including the palms, backs, fingers, between your fingers, and under your nails. Keep scrubbing for at least 20 seconds. Need a timer? Hum the "Happy Birthday" song twice.
4. Rinse your hands under clean, running water.
5. Dry your hands using a clean towel or air dry them.

When should you wash your hands?

• Before, during, and after preparing food

• Before eating food

• Before and after caring for someone who is sick

• Before and after treating a cut or wound

• After using the bathroom, changing diapers, or cleaning up a child who has used the bathroom

• After blowing your nose, coughing, or sneezing

• After touching an animal, animal food or treats, animal cages, or animal feces (poop)

• After touching garbage

• If your hands are visibly dirty or greasy

What type of soap should you use?
You can use bar soap or liquid soap to wash your hands. Many public places provide liquid soap because it's easier and cleaner to share with others. Studies have not found any added health benefit from using soaps containing antibacterial ingredients when compared with plain soap. Both are equally effective in getting rid of germs. If soap and water are not available, use an alcohol-based hand sanitizer that contains at least 60% alcohol.

Hand Sanitizers
Washing hands with soap and water is the best way to reduce the number of germs on them in most situations. If soap and water are not available, use an alcohol-based hand sanitizer that contains at least 60% alcohol. Alcohol-based hand sanitizers can quickly reduce the number of germs on hands in some situations, but sanitizers do **not** eliminate all types of germs and might not remove harmful chemicals.

Hand sanitizers are not as effective when hands are visibly dirty or greasy.

How do you use hand sanitizers?

- Apply the product to the palm of one hand (read the label to learn the correct amount).
- Rub your hands together.
- Rub the product over all surfaces of your hands and fingers until your hands are dry.

Nail Hygiene
Appropriate hand hygiene includes diligently cleaning fingernails, which may harbor dirt and germs and can contribute to the spread of some infections. Before clipping or grooming nails, all equipment should be properly cleaned. Sterilizing equipment before use is especially important. Infections of the fingernails are often characterized by swelling of the surrounding skin, pain in the surrounding area, or thickening of the nail. In some cases, these infections may be serious and need to be treated by a physician.

To help prevent the spread of germs and nail infections:

- Scrub the underside of nails with soap and water (or a nail brush) every time you wash your hands.

- Clean any nail grooming tools before use.
- Sterilize nail grooming tools before use.
- Avoid biting or chewing nails.
- Avoid cutting cuticles, as they act as barriers to prevent infection.
- Never rip or bite a hangnail. Instead, clip it with a clean, sanitized nail trimmer.

Global Handwashing Day
Celebrate Global Handwashing Day to promote handwashing with soap throughout the world. Global Handwashing Day is a way to support a global and local culture of handwashing with soap, shine a spotlight on the act of handwashing in each country, and raise awareness about the benefits of handwashing with soap. Since 2008, Global Handwashing Day has been celebrated annually on **October 15** worldwide. The Global Public-Private Partnership for Handwashing with Soap founded Global Handwashing Day and encourages school children, teachers, and families to get involved.

People and communities around the world will celebrate Global Handwashing day in many ways, including:

- Learning how to wash hands the right way through an online video produced by the Centers for Disease Control
- Watching a Facebook Live talk on why handwashing with soap is so important.
- Sharing handwashing lessons, events, and materials for thousands of students across the state of Georgia, where CDC is based.

How does handwashing help fight antibiotic resistance?
Antibiotic resistance occurs when bacteria resist the effects of an antibiotic – that is, germs are not killed and they continue to grow. Sicknesses caused by antibiotic-resistant bacteria can be harder to treat. Simply using antibiotics creates resistance, so avoiding infections in the first place reduces the amount of antibiotics that have to be used and reduces the likelihood that resistance will develop during treatment. Handwashing helps prevent many sicknesses, meaning less use of antibiotics.

Antiseptics
Dictionary.com defines antiseptics as: A substance that inhibits the proliferation of infectious microorganisms. Proliferation is the growth or production of cells by multiplication of parts.

Google explains them this way: antiseptic (anti-sep-tik) n. a chemical, such as **chlorhexidine** or **cetrimide**, that destroys or inhibits the growth of disease-causing bacteria and other microorganisms. Antiseptics are used externally to cleanse wounds and internally to treat infections of the intestine and bladder.

Encyclopedia.com explains antiseptics as:
An antiseptic is a substance that inhibits the growth and development of microorganisms. For practical purposes, antiseptics are routinely thought of as topical agents, for application to skin, mucous membranes, and inanimate objects, although a formal definition includes agents that are used internally, such as the urinary tract antiseptics.

Purpose
Antiseptics are a diverse class of drugs that are applied to skin surfaces or mucous membranes for their anti-infective effects.

This may be either bacteriocidal (kills bacteria) or bacteriostatic (stops the growth of bacteria). 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 of oral hygiene. Antiseptics are also used for disinfection of inanimate objects, including instruments and furniture surfaces.

Commonly used antiseptics for skin cleaning include benzalkonium chloride, chlorhexidine, hexachlorophine, alcohol, and hydrogen peroxide.
Other agents that have been used for this purpose, but have largely been supplanted by more effective or safer agents, include boric acid and volatile oils such as methyl salicylate (oil of wintergreen).

Chlorhexidine shows a high margin of safety when applied to mucous membranes, and has been used in oral rinses and preoperative total body washes.

Benzalkonium chloride and hexachlorophine are used primarily as hand scrubs or face washes. Benzalkonium may also find application as a disinfecting agent for instruments, and in low concentration as a preservative for drugs including ophthalmic solutions. Benzalkonium chloride is inactivated by organic compounds, including soap, and must not be applied to areas that have not been fully rinsed.

Hydrogen peroxide acts through the liberation of oxygen gas. Although the antibacterial activity of hydrogen peroxide is relatively weak, the liberation of oxygen bubbles produces an effervescent action, which may be useful for wound cleansing through removal of tissue debris. The activity of hydrogen peroxide may be reduced by the presence of blood and pus. The appropriate concentration of hydrogen peroxide for antiseptic use is 3%, although higher concentrations are available.

Precautions
Precautions vary with individual product and use. Hypersensitivity reactions should be considered with organic compounds such as chlorhexidine, benzalkonium and hexachlorophine. Skin dryness and irritation should be considered with all products, but particularly with those containing alcohol.

Most antiseptics have not been rated according to pregnancy category under the pregnancy risk factor system.
Hexachlorophene is schedule C during pregnancy, and should not be used on newborns due to risk of systemic absorption with potential central nervous system (CNS) effects, including convulsions.

Application of hexachlorophene to open wounds, mucous membranes, or areas of thin skin, such as the genitalia, should be avoided, since this may promote systemic absorption.

Chlorhexidine should not be instilled into the ear. There is one anecdotal report of deafness following use of chlorhexidine in a patient with a perforated eardrum. Safety in pregnancy and breastfeeding have not been reported; however there is one anecdotal report of an infant developing slowed heartbeat apparently related to maternal use of chlorhexidine.

Interactions
Antiseptics are not known to interact with any other skin products. However, they should not be used together with any other topical cream, solution, or ointment.

Parasite infection

Lice infestation
A lice infestation, or pediculosis, is caused by parasites living on human skin. Lice are tiny, wingless insects with sucking mouthparts that feed on human blood and lay eggs on body hair or in clothing. Lice bites can cause intense itching.

There are three related species of human lice:
- head lice, *Pediculus humanus capitis*
- body lice, *Pediculosis humanus corpus*
- pubic lice, *Phthirus pubis*, commonly called crab lice

Pediculosis capitis is an infestation of head lice. A body lice infestation is called pediculosis corporis. Pediculosis palpebrarum or phthiriasis palpebrarum, caused by crab lice, is an infestation of the pubic hair.

Head lice live and crawl on the scalp, sucking blood every three to six hours. Their claws are adapted for clinging to hair or clothing. Adult head lice can be silvery-white to reddish-brown. They are about the size of a sesame seed. Female lice lay their eggs in sacs called nits that are about 0.04 in (1 mm) long and are glued to shafts of hair close to the scalp. During her one-month lifespan a female louse may lay more than 100 eggs. The nymphs hatch in three to 14 days and must feed on blood within one day. Nymphs are smaller and lighter in color than adults and become sexually mature after nine to 12 days.

Body lice lay their nits in clothing or bedding. Occasionally the nits are attached to body hair. Body lice nits are oval and yellow to white in color. They may not hatch for up to 30 days. Nymphs mature in about seven days.

Pubic lice have large front legs and look like tiny crabs. Females are larger than males. Nits hatch in about one week and the nymphs mature in about seven days.

Transmission
Lice are endemic in human populations, spreading through personal contact or contact with infested clothing or other personal items. They can be transmitted when unaffected clothing is stored with infested items. Among children head lice are commonly transmitted by the sharing of hats, combs, brushes, hair accessories, headphones, pillows, and stuffed **toys** . Pubic lice are sexually transmitted, although occasionally they can be transmitted through infested bedding, towels, or clothing.
Lice do not jump, hop, or fly and they do not live on pets. Head lice cannot survive without a human host for more than a few days at most. Body lice can live without human contact for up to 10 days. Pubic lice can survive for one to two weeks without human contact.

Head lice infestations are extremely common among children in schools, childcare facilities, camps, and playgrounds. They are the second most common communicable health problem in children, after the common cold , and appear to be on the increase. Some 6 to 12 million American children get head lice every year. In developing countries more than 50 percent of the general population may be infested. Although anyone can get head lice, children aged three to ten and their families are most affected.

Lice infestations are characterized by intense itching caused by an allergic reaction to a toxin in lice saliva. The itching can interfere with sleep and concentration. Repeated bites can lead to generalized skin eruptions or inflammation. Swelling or inflammation of the neck glands are common complications of head lice.

Prevention
Prevention of lice infestation depends on adequate personal hygiene and consistently not sharing combs, brushes, hair accessories, hats, towels, or bedding. Hair should be checked weekly for lice and nits. Prevention includes sanitation and sterilization of salon equipment and implements as directed using an EPA approved product.

Lesson 3 Summary
In this lesson we have thoroughly discussed the most important aspects of standard cleaning and disinfecting precautions, how to distinguish between disinfectants and antiseptics, and how to sanitize hands and disinfect tools used in the practice of cosmetology. We now understand how to control the spread of bnacterial, viral, and fungal infections. We have also reviewed practices in bloodborne pathogens control as well as parasite infection and infestation control. Personal care service workers must consistently strive to maintain professional sanitation and sterilization methods in order to protect themselves and others in the salon environment. Let us now turn our attention to the next subject: Occupational Safety and Health Administration Regulations.

Lesson 4: Occupational Safety and Health Administration Regulations (2 hours)

Outline

- Hazard Communication Standard
- Safety Data Sheets
- Manufacturer's SDS

Learning objectives

After completing this lesson you will be able to

- list the 16 sections of Safety Data Sheets
- identify the purpose of the Hazard Communication Standard
- list the required sections and it's contents of a Safety Data Sheet
- recognize a manufacturer's SDS

Introduction

With the Occupational Safety and Health Act of 1970, Congress created the Occupational Safety and Health Administration (OSHA) to assure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance. OSHA is part of the United States Department of Labor. The administrator for OSHA is the Assistant Secretary of Labor for Occupational Safety and Health. OSHA's administrator answers to the Secretary of Labor, who is a member of the cabinet of the President of the United States.

Hazard Communication Standard

What is Hazard Classification?

Hazard classification is the process of evaluating the full range of available scientific evidence to determine if a chemical is hazardous, as well as to identify the level of severity of the hazardous effect. When complete, the evaluation identifies the hazard class(es) and associated hazard category of the chemical. The HCS defines hazard class as the nature of a physical or health hazard, e.g., flammable solid, carcinogen, and acute toxicity.

Hazard Communication Standard

OSHA's Hazard Communication Standard (HCS) is designed to protect against chemical injuries and illnesses by ensuring that employers and workers are provided with sufficient information to anticipate, recognize, evaluate, and control chemical hazards and take appropriate protective measures. This information is provided through **safety data sheets (SDSs), labels,** and employee training. **In order for SDSs, labels, and training to be effective, the hazard information they convey must be complete a nd accurate.** Thus, it is critically important to obtain comprehensive and correct information about the hazards associated with particular chemicals.

SAFETY DATA SHEETS (SDS)

Sections 1 through 8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures (e.g., fire fighting). This information should be helpful to those that need to get the information quickly.

Sections 9 through 11 and 16 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information, and other information including the date of preparation or last revision. The SDS must also state that no applicable information was found when the preparer does not find relevant information for any required element.

Sections 12 through 15, is required to be consistent with the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS), but OSHA will not enforce the content of these sections because they concern matters handled by other agencies.

The following 16 page document is the official manufacturer's Safety Data Sheet for Lysol Brand Disinfectant Concentrate

Conforms to USDOL OSHA 29CFR 1910.1200 HAZCOM

SAFETY DATA SHEET

Lysol Brand Disinfectant Concentrate

HEALTH • HYGIENE • HOME

1. Product and company identification

Product name : Lysol Brand Disinfectant Concentrate

Distributed by : Reckitt Benckiser LLC.
Morris Corporate Center IV
399 Interpace Parkway (P.O. Box 225)
Parsippany, New Jersey 07054-0225
+1 973 404 2600

Emergency telephone number (Medical) : 1-800-338-6167

Emergency telephone number (Transport) : 1-800-424-9300 (U.S. & Canada) CHEMTREC
Outside U.S. and Canada (North America), call Chemtrec:703-527-3887

Website: **http://www.rbnainfo.com**

Product use : Disinfectant.

This SDS is designed for workplace employees, emergency personnel and for other conditions and situations where there is greater potential for large-scale or prolonged exposure, in accordance with the requirements of USDOL Occupational Safety and Health Administration.

This SDS is not applicable for consumer use of our products. For consumer use, all precautionary and first aid language is provided on the product label in accordance with the applicable government regulations, and shown in Section 15 of this SDS.

SDS # : 353773PSDS v3.0

Formulation #: : 269-005 (353773 v10.0)

EPA ID No. : 777-94

UPC Code / Sizes : 19200-02201-10; 19200-77500-10 (12 fl.oz. PET Amber Pour Bottle with CRC cap)

2. Hazards identification

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 4
SKIN CORROSION/IRRITATION - Category 1C
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Combustible liquid.
Causes severe skin burns and eye damage.

Precautionary statements

2. Hazards identification

General : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

Prevention : Wear protective gloves. Wear eye or face protection. Wear protective clothing. Keep away from flames and hot surfaces. - No smoking. Wash hands thoroughly after handling.

Response : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

Storage : Store locked up. Store in a well-ventilated place. Keep cool.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : None known.

Hazards not otherwise classified : None known.

3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	%	CAS number
clorofene	5 - 10	120-32-1
potassium hydroxide	2.5 - 5	1310-58-3
Ethyl alcohol	1 - 2.5	64-17-5
Isopropyl alcohol	1 - 2.5	67-63-0

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

4. First aid measures

Skin contact : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.

Skin contact : Causes severe burns.

Ingestion : May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : Combustible liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
halogenated compounds
metal oxide/oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

6. Accidental release measures

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure controls/personal protection

Control

Occupational exposure limits

Ingredient name	Exposure limits
potassium hydroxide	**ACGIH TLV (United States, 6/2013).** C: 2 mg/m³ **OSHA PEL 1989 (United States, 3/1989).** CEIL: 2 mg/m³ **NIOSH REL (United States, 10/2013).** TWA: 2 mg/m³ 10 hours.
Ethyl alcohol	**ACGIH TLV (United States, 6/2013).** STEL: 1000 ppm 15 minutes. **OSHA PEL 1989 (United States, 3/1989).** TWA: 1000 ppm 8 hours. TWA: 1900 mg/m³ 8 hours. **NIOSH REL (United States, 10/2013).** TWA: 1000 ppm 10 hours. TWA: 1900 mg/m³ 10 hours. **OSHA PEL (United States, 2/2013).**

8. Exposure controls/personal protection

	TWA: 1000 ppm 8 hours. TWA: 1900 mg/m³ 8 hours.
Isopropyl alcohol	**ACGIH TLV (United States, 6/2013).** TWA: 200 ppm 8 hours. STEL: 400 ppm 15 minutes. **OSHA PEL 1989 (United States, 3/1989).** TWA: 400 ppm 8 hours. TWA: 980 mg/m³ 8 hours. STEL: 500 ppm 15 minutes. STEL: 1225 mg/m³ 15 minutes. **NIOSH REL (United States, 10/2013).** TWA: 400 ppm 10 hours. TWA: 980 mg/m³ 10 hours. STEL: 500 ppm 15 minutes. STEL: 1225 mg/m³ 15 minutes. **OSHA PEL (United States, 2/2013).** TWA: 400 ppm 8 hours. TWA: 980 mg/m³ 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

8. Exposure controls/personal protection

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

9. Physical and chemical properties

Appearance

Physical state : Liquid. [Clear.]

Color : Red.

Odor : soap

Odor threshold : Not available.

pH : 10.3 to 11.1 [Conc. (% w/w): 100%]

Melting point : Not available.

Boiling point : Not available.

Flash point : Closed cup: 62.8°C (145°F)

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Relative density : 1.024 to 1.034

Solubility : Easily soluble in the following materials: cold water and hot water.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not available.

10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Incompatible materials : Reactive or incompatible with the following materials:
oxidizing materials

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
clorofene	LD50 Oral	Rat	1700 mg/kg	-
Ethyl alcohol	LC50 Inhalation Vapor	Rat	124700 mg/m³	4 hours
	LD50 Oral	Rat	7 g/kg	-
Isopropyl alcohol	LD50 Dermal	Rabbit	12800 mg/kg	-
	LD50 Oral	Rat	5000 mg/kg	-
*Lysol Brand Disinfectant Concentrate, Original Scent	LC50 Inhalation Vapor	Rat	>2.07 mg/l	4 hours
	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	5000 mg/kg	-

Conclusion/Summary : Not classified Harmful. *Information is based on toxicity test result of a similar product.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
clorofene	Skin - Mild irritant	Human	-	48 hours 1 Percent	-
potassium hydroxide	Eyes - Moderate irritant	Rabbit	-	24 hours 1 milligrams	-
	Skin - Severe irritant	Guinea pig	-	24 hours 50 milligrams	-
	Skin - Severe irritant	Human	-	24 hours 50 milligrams	-
	Skin - Severe irritant	Rabbit	-	24 hours 50 milligrams	-
Ethyl alcohol	Eyes - Moderate irritant	Rabbit	-	0.066666667 minutes 100 milligrams	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	100 microliters	-
	Eyes - Severe irritant	Rabbit	-	500 milligrams	-
	Skin - Mild irritant	Rabbit	-	400 milligrams	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
Isopropyl alcohol	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-
	Eyes - Severe irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	500 milligrams	-
*Lysol Brand Disinfectant Concentrate, Original Scent	Skin - Visible necrosis	Rabbit	-	240 minutes	14 days
	Eyes - Cornea opacity	Rabbit	>3	-	-

Conclusion/Summary

Skin : Causes burns. *Information is based on toxicity test result of a similar product.

Eyes : Causes irreversible eye damage *Information is based on toxicity test result of a similar product.

Sensitization

11. Toxicological information

Product/ingredient name	Route of exposure	Species	Result
*Lysol Brand Disinfectant Concentrate, Original Scent	skin	Guinea pig	Not sensitizing

Conclusion/Summary

Skin : Non-sensitizer to skin. *Information is based on toxicity test result of a similar product.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
Ethyl alcohol	-	1	-
Isopropyl alcohol	-	3	-

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Isopropyl alcohol	Category 3	Not applicable.	Narcotic effects

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system.

Skin contact : Causes severe burns.

Ingestion : May cause burns to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

11. Toxicological information

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
clorofene	Acute EC50 0.59 ppm Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 0.33 ppm Fresh water	Fish - Lepomis macrochirus	96 hours
potassium hydroxide	Acute LC50 80 ppm Fresh water	Fish - Gambusia affinis - Adult	96 hours
Ethyl alcohol	Acute EC50 17.921 mg/l Marine water	Algae - Ulva pertusa	96 hours
	Acute EC50 2000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 25500 µg/l Marine water	Crustaceans - Artemia franciscana - Larvae	48 hours
	Acute LC50 42000 µg/l Fresh water	Fish - Oncorhynchus mykiss	4 days
	Chronic NOEC 4.995 mg/l Marine water	Algae - Ulva pertusa	96 hours
	Chronic NOEC 0.375 ul/L Fresh water	Fish - Gambusia holbrooki -	12 weeks

12. Ecological information

Isopropyl alcohol	Acute LC50 1400000 µg/l Marine water Acute LC50 4200 mg/l Fresh water	Larvae Crustaceans - Crangon crangon Fish - Rasbora heteromorpha	48 hours 96 hours

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
clorofene	3.6	-	low
Ethyl alcohol	-0.35	-	low
Isopropyl alcohol	0.05	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information

14. Transport information

DOT Classification	UN1760	Corrosive liquids, n.o.s. (potassium hydroxide, 2,4-xylenol) RQ (potassium hydroxide, 2,4-xylenol)	8	II		**Reportable quantity** 25990.9 lbs / 11799.9 kg [3029.3 gal / 11467.3 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements. **Limited quantity** Yes. **Packaging instruction** **Passenger aircraft** Quantity limitation: 1 L **Cargo aircraft** Quantity limitation: 30 L **Special provisions** B2, IB2, T11, TP2, TP27
TDG Classification	UN1760	CORROSIVE LIQUID, N.O.S. (potassium hydroxide, 2,4-xylenol)	8	II		**Explosive Limit and Limited Quantity Index** 1 **Passenger Carrying Road or Rail Index** 1 **Special provisions** 16
Mexico Classification	UN1760	LIQUIDO CORROSIVO, N.E.P. (potassium hydroxide, 2,4-xylenol)	8	II		**Special provisions** 274
IMDG Class	UN1760	CORROSIVE LIQUID, N.O.S. (potassium hydroxide, 2,4-xylenol)	8	II		**Emergency schedules (EmS)** F-A, S-B **Special provisions** 274

14. Transport information

IATA-DGR Class	UN1760	Corrosive liquid, n.o.s. (potassium hydroxide, 2,4-xylenol)	8	II		**Passenger and Cargo Aircraft** Quantity limitation: 1 L Packaging instructions: 851 **Cargo Aircraft Only** Quantity limitation: 30 L Packaging instructions: 855 **Limited Quantities - Passenger Aircraft** Quantity limitation: 0.5 L Packaging instructions: Y840 **Special provisions** A3, A803

PG* : Packing group

15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) PAIR**: 2-methylpropan-2-ol

TSCA 8(a) CDR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): Not determined.

Clean Water Act (CWA) 307: clorofene; 2,4-xylenol

Clean Water Act (CWA) 311: potassium hydroxide; sodium hydroxide; ammonia, anhydrous; xylenol; m-cresol; p-cresol

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
Ammonia	< 0.01	Yes.	500	-	100	-

SARA 304 RQ : 100000000 lbs / 45400000 kg [11655404.4 gal / 44120505.3 L]

15. Regulatory information

SARA 311/312

Classification : Fire hazard
Immediate (acute) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
clorofene	5 - 10	No.	No.	No.	Yes.	No.
potassium hydroxide	2.5 - 5	No.	No.	No.	Yes.	No.
Ethyl alcohol	1 - 2.5	Yes.	No.	No.	Yes.	No.
Isopropyl alcohol	1 - 2.5	Yes.	No.	No.	Yes.	No.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	clorofene Isopropyl alcohol	120-32-1 67-63-0	5.4998 1.8333
Supplier notification	clorofene Isopropyl alcohol	120-32-1 67-63-0	5.4998 1.8333

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : The following components are listed: POTASSIUM HYDROXIDE; ISOPROPYL ALCOHOL; ETHYL ALCOHOL

New York : The following components are listed: Potassium hydroxide

New Jersey : The following components are listed: POTASSIUM HYDROXIDE; CAUSTIC POTASH; ISOPROPYL ALCOHOL; 2-PROPANOL; ETHYL ALCOHOL; ALCOHOL

Pennsylvania : The following components are listed: POTASSIUM HYDROXIDE (K(OH)); CHLORINATED PHENOLS; 2-PROPANOL; DENATURED ALCOHOL

Label elements

Signal word: : DANGER

Hazard statements : Harmful if swallowed.

Corrosive Causes irreversible eye damage

Corrosive CAUSES SKIN BURNS.

Precautionary measures : Keep out of reach of children.
Do not get in eyes, on skin, or on clothing.
Avoid breathing vapor or mist.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.
Remove contaminated clothing and wash it before reuse.

Avoid breathing dust/fume/gas/mist/vapors/spray.

16. Other information

Hazardous Material Information System (U.S.A.) :

Health	3
Flammability	2
Physical hazards	0
Personal protection	D

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

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16. Other information

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Revision comments : Update as per US GHS.

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

RB is a member of the CSPA Product Care Product Stewardship Program.

Lesson 4 Summary

In this lesson we have thoroughly discussed important facts about the Occupational Safety and Health Administration's Hazard Communication Standard . We have identified all key elements of Safety Data Sheets and how they apply to businesses. And lastly we reviewed an official manufacturer's Safety Data Sheet and. It is recommended that personal service workers, such as salon professionals, stay up to date on any changes or improvements made by OSHA or any other government entities regarding the topic of Federal workplace regulations.

Course Summary

We have now completed this course. In this review, we focused on many topics of the principles, practices and theories pertinent to being a licensed professional. We have discussed the science of Nail Anatomy and Creative Artistry. We have also discussed the importance of Sanitation and Sterilization and OSHA Regulations. This knowledge is a necessary base for a solid foundation in the success of a professional career in the beauty industry. We applaud your continued interest in learning and your motivation to keep your professional license in good standing with the State Board. We invite you to participate in our course next renewal cycle. Thank you and congratulations on completing this Continuing Education Course.

References and Resources

Nail Art (8 hours) © ContinuingCosmetology.com;
Illustrations and images © ContinuingCosmetology.com

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