Skin (6 total hours)

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Lesson 1: Anatomy and Conditions of the Skin (2 hours)

Outline

- Composition of the Skin
- Functions of the Skin
- Diseases and Conditions
- Skin Pigment Disorders
- Hypertrophies, Inflammations, Allergies
- Contagious Disorders

Learning objectives:

After completing this lesson you will be able to:

- describe the structural composition of the skin
- describe the composition and the 3 principle functions of the epidermis
- define the composition of the dermis
- identify the composition and function of subcutaneous fat
- identify terminology for skin conditions and disorders
- identify diseases associated with the skin
- describe pigment disorders
- define and describe vitiligo
- define and describe various types of warts
- identify inflammatory skin conditions
- describe eczema
- list and define the different types of psoriasis
- define dermatitis and it's causes and symptoms
- list and define the various types of skin lesions
- explain dermatitis and it's causes
- define fungal infections
- identify ringworm
- list the types of skin cancers and risk factors
- fine the types of disorders of the sebaceous gland
- identify and describe the various types of acne scars

Introduction

The purpose of this study is to review the anatomy and functions of the skin to include conditions and diseases.

Skin

Our level of health is often seen in the appearance of the skin. Environmental elements, hormonal imbalances, and stress can also change the skin's appearance.
Understanding the structure and function of skin can help in help in maintaining it's good health. Skin is our body's protective covering.

Our skin is varied with types and colorings from person to person. The skin, in a healthy state is very resilient and self-healing. It renews itself in the outer layer every 30 days.
It is the largest organ of the body and is just a few millimeters thick .
It's layers has many functions and activities primarily as a protective covering for our muscles, tendons, bones and organs.
It keeps our internal workings intact, acts as a barrier to bacteria and foreign bodies and secretes natural waste through sweat. Together the sweat and the sebum combine on the skin's surface to form the barrier-like acid mantle.

A vital regulator of temperature, skin acts as our cooling system. We flush when we're hot because blood vessels near the skin's surface dilate to allow more warm blood to circulate closer to the air to cool. When we're cold and need to conserve warmth, the blood vessels contract, so that a pale appearance is produced.

Sense of touch is due to nerve endings in the dermis. They are the reactors of heat, cold touch, pressure and pain.

The skin is not abundantly absorbent as only small amounts of water or oil-soluble substances can penetrate. Ultra-violet radiation can penetrate for the good as in the case of producing vital Vitamin D and for the bad, as with unsafe sun exposure.

Composition

Skin layers: Epidermis, Dermis, Subcutaneous Fat

The skin is made up of three distinct layers.
The outer most layer is called the epidermis.
The word epidermis, and the name of the second skin layer, the dermis, both come from the name used by the ancient Greeks for the skin, derma.
From this we also get the word dermatologist, meaning a doctor who specialize in skin problems. The epidermis is translucent. It allows light to pass partially through it similar to frosted glass.

The **epidermis** does not contain any blood vessels but gets its oxygen and nutrients from the deeper layers of the skin.
At the bottom of the epidermis is a very thin membrane, called the basement membrane, which attaches the epidermis to the layer below.

The second layer lies deeper and is called the **dermis**. It contains blood vessels, nerves, hair roots and sweat glands.

Below the dermis lies a layer of fat, the **subcutaneous fat.** The depth of this layer differs from one person to another. It contains larger blood vessels and nerves, and is made up of clumps of fat-filled cells called adipose cells.

The subcutaneous fat lies on the muscles and bones and whole skin structure is attached by connective tissues. The attachment is loose, so the skin can move fairly freely. If the subcutaneous tissues fill up with too much fat the skin cannot move as easily and this is what creates cellulite.
The skin has layers running from the outer epidermis, the dermis and the sub layers of connective tissue. Starting with the skin's outer layer, it is five layered with it's main characteristics being thin in feel, but proactive despite lacking in blood vessels or nerves.

Deep within, new skin cells are continuously formed to replace the constant shedding of surface cells.

The outermost layer is made up of a flexible protein keratin.
It is constantly being shed and replaced by the new cells. New skin cells are nourished by the dermis and if nutrient starved, will be poorly formed. However, if they have been fed from the start, the skin will be smooth, and hydrated.

It is important to remove make-up daily so that skin cells can flake off without oil and cosmetics clogging the process. At the same time, the skin's pH between 4.5 and 6 needs to be preserved and not stripped with harsh, dehydrating products.

The thickest, innermost section of the skin is the dual layered dermis, home to several vital structures. A mesh of twin proteins, collagen and elastin fibers give skin its contours and elasticity. As we age these deteriorate. The sebaceous glands, nerve endings, hair follicles and essential blood vessels all co-exist.

Sebum secreted from the sebaceous glands lubricates the skin and is slightly acidic in content. It is also somewhat anti-bacterial. Hormonal activity controls the amount of oil that the glands produce.

Should oil from the pores be overly plentiful, greasy skin and potential eruptions could result. If oil is low the skin will be dry and possibly scaly.
The third layer of skin is a connective tissue dividing the dermis from the muscular layer.

Networks of tiny blood vessels run through the epidermis bringing food, vitamins and oxygen.

In pale people, these vessels can be seen through the epidermis, particularly if the veins widen otherwise known as broken veins.

If the blood carries plenty of oxygen it will be pink and the skin will tend to have a rosy color. If the blood is running sluggishly and has lost most of its oxygen the skin will look bluer.

These blood vessels respond to temperature changes. They open up in hot weather, bringing lots of red blood cells - and hence a pink flush to the skin, and close down in the cold; this is why cold skin often looks blue.

In most areas of the body the epidermis is only 35-50 micrometers thick. A micrometer is one-millionth of a meter, one-thousandth of a millimeter. On the palms and the soles it is usually much thicker, up to several millimeters.

Functions of the Skin

Absorption	Substances can enter the body through the skin.
Excretion	Sweat glands within the skin puts out perspiration.
Heat regulation	Skin maintains our 98.6 °F body temperature.
Protection	Skin protects us from bacteria and viruses.
Secretion	Sebum is created by the sebaceous glands within the skin.
Sensation	Feeling cold, heat, pain and pressure.

Some of these functions are so important that unless most of the skin is working efficiently, we will die. This is the reason why second or third degree burns are so serious.

When the skin is destroyed over a large area, there is no way of controlling the rate at which water is lost to the outside environment, or of regulating the temperature of the body or of controlling infection. Someone who has lost over half their skin this way is unlikely to survive.

Although we think of the skin as a single organ, the epidermis and dermis have, to some extent, separate functions.

The function of water conservation is however dependent on both; the role of the stratum corneum in this field is absolutely vital, as it acts as a semipermeable barrier and allows us to survive in a hostile environment.

The epidermis has three principal functions:

- protecting the body from the environment, particularly the sun
- preventing excessive water loss from the body
- protecting the body from infection.

Epidermis is made up of:

- stratum corneum (horny layer)
- keratinocytes (squamous cells)
- basal layer

Dermis:The dermis is the middle layer of the skin.

- blood vessels
- lymph vessels
- hair follicles
- sweat glands
- collagen bundles
- fibroblasts
- nerves

Subcutis: The subcutis is the deepest layer of skin. The subcutis consists of a network of collagen and fat cells. It helps conserve the body's heat and protects the body from injury.

Diseases and Conditions of the Skin

Bacteria and viruses can invade through an injury or opening of the skin.
The skin is made up of natural occurring barriers that protect us from undesirable environmental elements from entering our body
All areas of the skin contain nerves which are sensory receptors. Without these receptors we could not feel heat, cold pressure or pain.

Descriptive Terms and Definitions: In reference to diseases and conditions

Acute	Severe symptoms.
Allergy	Physical reaction by the skin due to exposure to a substance.
Chronic	Recurring and long duration of symptoms
Contagious	Communicable
Dermatologist	Physician who specializes in the medical practice of the skin
Dermatology	The study, analysis and treatment of skin.
Diagnosis	Recognition of a disease by its symptoms
Disease	The pathological interference of the normal function of the body or it's parts
Disorder	An abnormal condition that is usually not contagious
Epidemic	Wide spread disease that affects a large number of people

Etiology	The study of the causes of diseases
Immune	When the body is totally resistant to a certain disease.
Immunity	Refers to the body's level and ability to be resistant to disease.
Infectious	The ability of a bacteria to enter the body
Inflammation	A skin disorder characterized by redness, pain, edema, and heat.
Occupational	Due to the activity of your job, possibly repetitive.
Parasitic	The type of any condition caused by animal or vegetable parasites.
Pathogenic	Any disease whose origin is bacterial
Pathology	The study of disease .
Prognosis	The predetermination, using educated insight, of the probable course of a disease.
Seasonal	Effects due to the exposure of changes in weather occurring throughout the year.
Subjective symptom	A symptom that can be felt but not seen

In a salon, you will assuredly come in contact with diseases and disorders of the skin.

You are responsible for being able to recognize infectious diseases and conditions that should be referred to a physician.

Conditions of the Skin

Albinism	Congenital condition in which there is an absence of melanin pigment.
Chloasma	Patches of increased deposits of pigment in the skin are also known as liver spots.
Leucoderma	Light patches on the skin due to congenital defective pigmentations.
Naevus	A birthmark also known as portwine or strawberry that can be small or large and that includes the malformation of skin due to pigmentation or dilated capillaries.
Lentigo	Small spots that can be yellow to brown in color.
Vitiligo	The type of condition of leucoderma that can affect skin or hair.

Hypertrophies (excessive growth)

Keratoma	The callus. It is the superficial, round, thickening of the epidermis caused by friction. If it grows inward it is called a corn.
Mole	A small spot on the skin that can be flat or raised. It is sometimes genetically inherited and it's colors can range from tan to brown or bluish black.
Polyp	A growth on the body that sometimes extends from the surface of the skin and others within the skin.

Skin Tag	A bead-like fibrous tissue that protrudes from the surface of the skin and is sometimes a dark color
Verruca	A wart, a viral infection of the epidermis and non cancerous.

Skin Pigment Disorders
Skin color is determined by a pigment (melanin) ma de by specialized cells in the skin (melanocytes) . The amount and type of melanin determines a person's skin color.

Melanin gives color to the skin, hair, and iris of the eyes. Levels of melanin depend on race and amount of sunlight exposure.

Sun exposure increases melanin production - to protect the skin against harmful ultraviolet rays.
In addition, hormonal changes can affect melanin production.

Color changes of the skin and discoloration including shades of red, brown, purple and black are danger signs. Skin thickening can also be a sign of danger and should be examined by a physician.

Vitiligo
Vitiligo is a disorder in which white patches of skin appear on different parts of the body. This happens because the cells that make pigment in the skin are destroyed. These cells are called melanocytes.

Vitiligo can also affect the mucous membranes such as the tissue inside the mouth and nose and the eye.

The cause is not known. Vitiligo may be an autoimmune disease. These diseases happen when your immune system mistakenly attacks some part of your own body.

In vitiligo, the immune system may destroy the melanocytes in the skin. It is also possible that one or more genes may make a person more likely to get the disorder.

Some researchers think that the melanocytes destroy themselves. Others think that a single event such as sunburn or emotional distress can cause vitiligo. But these events have not been proven to cause vitiligo.

In the United States, 2 to 5 million people have the disorder. Most people with vitiligo develop it before the age of 40. The disorder affects all races and both sexes equally. People with certain autoimmune diseases such as thyroid disease are more likely to get vitiligo than people who don't have any autoimmune diseases. Scientists do not know why vitiligo is connected with these diseases.

Vitiligo may also run in families. Children whose parents have the disorder are more likely to develop vitiligo. White patches on the skin are the main sign of vitiligo. These patches are more common in areas where the skin is exposed to the sun. The patches may be on the hands, feet, arms, face, and lips.

Other common areas for white patches are:

- The armpits and groin (where the leg meets the body)
- Around the mouth
- Eyes
- Nostrils
- Navel and
- Genitals

Those with dark skin may notice a loss of color inside their mouths. There is no way to tell if vitiligo will spread.
For some people, the white patches do not spread. For some people, vitiligo spreads slowly, over many years. For other people, spreading occurs quickly. Some people have reported more white patches after physical or emotional stress.

Moles
According to recent research, certain moles are at higher risk for changing into cancerous growths, including malignant melanoma, a form of skin cancer. Moles that are present at birth and atypical moles have a greater chance of becoming malignant.
Recognizing changes in your moles is crucial in detecting malignant melanoma, and other cancerous skin growths at its earliest stage of development.

Warts
Warts are non-cancerous skin growths caused by the papillomavirus. Warts are more common in children than adults, although they can develop at any age.
Warts can spread to other parts of the body and to other persons. There are many different types of warts, due to many different papillomavirus types, more than 100. Warts are not painful, except when located on the feet. Most warts go away, without treatment, over an extended period of time.

Common Types of Warts

common warts	Located around the nails and the back of the hands, rough surfaced, grayish-yellow or brown in color
foot warts	located on the soles of feet (plantar warts) with black dots (clotted blood vessels that once fed them); clusters of plantar warts are called mosaic; can be painful
flat warts	small, smooth growths that grow in groups up to 100 at a time; most often appear on children's faces
filiform warts	small, long, narrow growths that usually appear on eyelids, face, or neck

Inflammations

Eczema	Dry or moist lesions accompanied by itching and burning that usually has red-blisters and oozing.
Psoriasis	Lesions that are often round and are dry. Occurring in patches, they are covered with coarse, silvery scales. When irritated, they bleed. Although it spreads on the patient, it is not contagious.

Psoriasis

Psoriasis is a chronic skin condition characterized by inflamed, red, raised areas that often develop as silvery scales on the scalp, elbows, knees, and lower back.
Psoriasis is estimated to affect between 5 million to 7 million people in the US.

The cause of psoriasis is unknown, however, it is thought to be caused by abnormally fast-growing and shedding skin cells.

The skin cells multiply quickly causing the skin to shed every three to four days. Though not contagious, **the condition is hereditary.** Psoriasis is often recurrent and occurs in varying severity.

Types and symptoms
Individual will experience symptoms differently, as psoriasis comes in several forms and severities.

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

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

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

Allergy Related Dermatitis of the Skin

Dermatitis Medicamentosa	Dermatitis that occurs after an medical injection.
Dermatitis Venenata	Allergy to ingredients in cosmetics.
Urticaria	Hives and inflammation caused by an allergy to specific drugs or foods.

Contact Dermatitis
Contact dermatitis is a physiological reaction that occurs after skin comes in contact with certain substances.
The majority of these reactions are caused by irritants to the skin. The remaining reactions are caused by allergens, which trigger an allergic response.

In allergic reactions, the reaction may not start until after several days.
Contact dermatitis caused by an irritant that is not an allergic response occurs from direct contact with the irritant.
Adults are most commonly affected by allergic contact dermatitis, but it can affect persons of all ages.

Causes
The most common causes of allergic contact dermatitis in adults include the following:

- soaps
- different foods
- detergents
- perfumes

Plants, as well as metals, cosmetics, and medications may also cause a contact dermatitis reaction:

- **poison ivy**
  Poison ivy, which is part of a plant family that includes poison oak and sumac, is the most common cause of a contact dermatitis reaction.

- **metals**
  Nearly 3,000 chemical agents are capable of causing allergic contact dermatitis. Nickel, chrome, and mercury are the most common metals that cause contact dermatitis

- **cosmetics**
  Many types of cosmetics can cause allergic contact dermatitis. Permanent hair dyes that contain paraphenylenediamine are the most frequent causes. Other products that may cause problems include dyes used in clothing, perfumes, eye shadow, nail polish, lipstick, and some sunscreens.

- **medications**
  Neomycin, which is found in antibiotic creams, is the most common cause of medication contact dermatitis. Penicillin, sulfa medications, and local anesthetics, such as novocaine or paraben, are other possible causes.

Symptoms of Contact Dermatitis

- mild redness and swelling of the skin
- blistering of the skin
- itching
- scaling and temporary thickening of skin

Skin Lesions

Bulla	A blister containing body fluids.
Crust	Scab
Excoriation	An abrasion caused by injury such as a scraped knee.
Fissure	A crack in the skin that penetrates the dermal layer.
Macule	A small, discolored spot or patch on the skin's surface. A freckle is a good example of a macule
Scale	The accumulation of flakes of the epidermal layer.
Ulcer	Open lesions on the skin or mucous membranes.
Vesicle	A blister that contains body fluid within or just beneath the epidermis, an example is poison ivy.
Wheal	An itchy, swollen lesion that is temporary, for example: a mosquito bite.

Contagious Disorders of the Skin

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.

Fungal Infections of the Skin
Skin fungi live in the dead, top layer of skin cells in moist areas of the body, such as the scalp. These fungal infections cause only a small amount of irritation.
Other types of fungal infections penetrate deeper and may cause itching, swelling, blistering, and scaling.

In some cases, fungal infections can cause reactions elsewhere on the body.
For example, a person may develop a rash on the scalp after touching an infected foot.
There are many types of fungal skin infections that require clinical care by a physician or other healthcare professional.

Tinea infections: Ringworm
"Ringworm" is a misleading term that refers to the circular appearance of the fungal lesion. There are no worms involved. Different fungi, depending on their location on the body, cause ringworm. Ringworm is characterized by ring-shaped, red, scaly patches with clearing centers.

Tinea is ringworm caused by fungus, a vegetable parasite, that includes symptoms of scaling of the skin. It can effect the skin on any part of the body.

There is an increased risk of contracting ringworm if a person:
- is malnourished.
- has poor hygiene.
- lives in a warm climate.
- has contact with other persons or pets that have ringworm.
- is immunocompromised by disease or medication.

Athlete's Foot
Athlete's foot is also known as tinea pedis or ringworm of the foot.
Contributing causes include sweating, not drying the feet well
after swimming or bathing, wearing tight socks and shoes, and warm weather conditions.

Symptoms of athlete's foot may include:
- whitening of the skin between the toes
- scaling of the feet
- itchy rash on the feet
- blisters on the feet

Body Ringworm (tinea corporis)
This skin infection is characterized by a ring-like rash anywhere on the body or the face. It occurs in all ages, but is seen more frequently in children. It is more common in warmer climates.

The symptoms of body ringworm may include:

- red, circular lesion with raised edges
- the middle of the lesion may become less red as the lesion grows
- itching of the affected area

The lesions of ringworm are unique, and usually allow for a diagnosis simply on physical examination. Because the fungi can live indefinitely on the skin, recurrences of ringworm are likely.

Skin Cancers

Basal Cell Carcinoma	The least serious type of skin cancer, containing light or pearly nodules with visible blood vessels.
Malignant Melanoma	The most serious type of skin cancer, containing dark brown, black, or discolored patches on the skin.
Squamous Cell Carcinoma	Scaly, red papules.
Tumor	Abnormal growth of swollen tissue.

At Risk
Skin cancer is more common in fair-skinned people - especially those with blond or red hair, who have light-colored eyes. Skin cancer is rare in children. Almost half of all Americans who live to age 65 will be diagnosed with skin cancer at some point in their lives, according to the National Cancer Institute.

Other risk factors include the following:
- family history of melanoma
- sun exposure
- early childhood sunburns
- many freckles
- many ordinary moles (more than 50)

Disorders of the Sebaceous Glands

Acne Rosacea	The chronic inflammatory congestion of the cheeks and nose
Acne Simplex	The chronic inflammatory disorder that usually related to hormonal changes and overactive sebaceous glands
Acne Vulgaris	Acne pimples
Comedones	Blackheads, keratinized cells and hardened sebum
Cysts	Round, body fluid filled sac within the dermis caused by a ruptured follicle
Furuncle	A boil, which is a subcutaneous abscess that fills with pus
Milia	Whiteheads, which is an accumulation of dead, keratinized cells and sebaceous matter trapped beneath the skin's surface
Pimples	A follicle filled with oil, dead cells, bacteria and pus
Seborrhea	Oily Dandruff

Acne Scars

Acne Pit Scar	Sunken appearance, caused by pimples or cysts
Raised Scar	Lump of raised tissue on the surface of the skin, caused where cysts have clumped together
Ice Pick Scar	Large, open pore appearance, as if scarred with an ice pick, caused by deep pimples or cysts

Acne is a disorder of the hair follicles and sebaceous glands. The glands become clogged, leading to pimples and cysts. Acne is very common - nearly 17 million people in the US are affected by this condition.
Acne most often begins in puberty. During puberty, the male sex hormones (androgens) increase in both boys and girls, causing the sebaceous glands to become more active - resulting in increased production of oil (sebum).
The sebaceous glands produce sebum that normally travels via hair follicles to the skin surface. However, skin cells can plug the follicles, blocking the sebum coming from the sebaceous glands.
When follicles become plugged, skin bacteria begin to grow inside the follicles, causing inflammation.
Eventually, the plugged follicle bursts, spilling oil, skin cells, and bacteria onto the skin surface. In turn, the skin becomes irritated and pimples or lesions begin to develop. Acne can be superficial or deep.

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

- face
- chest
- upper back
- shoulders
- neck

The following are the most common symptoms of acne. However, each individual may experience symptoms differently.

Symptoms may include:

- blackheads
- whiteheads
- pus-filled lesions that may be painful
- nodules (solid, raised bumps)

Lesson 1 Summary
In this lesson we reviewed important facts about the structural composition of the skin, and it's functions. We have refreshed our knowledge on terminology associated with skin composition, conditions and diseases. . We can list and describe symptoms of conditions and diseases and can with great detail and accuracy identify types of disorders. We have also refreshed our knowledge of acne conditions that are most common. The next topic for review is The Professional Facial.

Lesson 2: The Professional Facial (2 hours)

Outline

- Environmental Impact
- Protecting the Skin
- Categories of Facials
- Implements used for the Facial
- Service Client Preparation
- Skin Analysis
- Applications of the Facial Service
- Skin Care Products and Ingredients

Learning objectives:
After completing this lesson you will be able to:

- explain the environmental impact on the skin
- describe symptoms of sunburn
- describe conditions that can change the appearance of the skin
- describe aging skin
- identify the benefits of a facial
- list the materials and equipment required for a facial
- list the basic procedures of a facial
- identify skin care products and ingredients
- describe skin cleansers
- identify the categories of skin toners
- identify types of skin masks

Introduction: The purpose of this study is to review principles, practices and theories of skin health and facial services.

Environmental Impact on the Skin

The sun produces enormous amounts of heat and light, some of which reaches the earth. Without this heat and light there would be no life.
Unfortunately the sun also produces less beneficial rays, which are completely invisible to us, called ultraviolet radiation.
Part of this radiation is reflected by the stratum corneum at the skin surface, part is absorbed by the melanin in the epidermal cells, and some is scattered within the skin.

All three processes contribute to the vital function of protecting the nuclei of the cells in the epidermis and the collagen of the dermis.
This scattered radiation creates a lot of high-energy particles, which are called free radicals.
Free radicals are very reactive, and attack the constituents of the skin: this is why over a long time ultraviolet radiation produces so much damage.

Sunlight reflected from snow can damage our skin because it contains a substantial proportion of ultraviolet radiation.

Sunburn
The following are the most common symptoms of a sunburn. However, each individual may experience symptoms differently. Symptoms may include:

- redness
- swelling of the skin
- pain
- blisters
- fever
- chills
- weakness
- dry, itching, and peeling skin days after the burn

Water and the skin
Throughout our lives our bodies naturally lose water by constant gentle evaporation through our skins trans-epidermal water loss, although we are unaware of the process.

Preventing excessive water loss is exceptionally important. In the normal epidermis the water content gets less the closer we get to the surface.
Water makes up to 70-75% of the weight of the basal layer, but only 10-15% of the stratum corneum.
The stratum corneum is a particularly important barrier to the control of moisture loss.

Cell Regeneration
With increasing age, the skin's cell renewal process becomes less efficient.
Tissue repair and cell regeneration slow down.
The amount of natural moisture present in the skin is reduced.
Because collagen production is less, the skin becomes thinner and loses its flexibility.

Protecting the Skin
The most obvious sign of aging is a decrease in the overall thickness of the epidermis as a whole, with a reduction in the number of cell layers.

The number of cells in the stratum corneum does not diminish with age, however; this is important, because of the vital role of this layer as the skin barrier.

On the other hand, the numbers of melanocytes and other cells do decrease with age. Metabolism in the skin slows down. So does the rate at which epidermal cells are produced, which may interfere with wound healing.

The time necessary to repair the stratum corneum barrier increases considerably with age: the replacement of skin cells takes about twice as long for people over 75 as for those around 30.Although the sebaceous glands themselves do not change much with increasing age, sebum production declines in many older people, especially after the age of 70. With age, the number of active sweat glands falls and their output of sweat decreases too. As a result, perspiration is less in elderly skin. This explains why older people often find it hard to adapt to hot weather.

Most older people have dry skin and therefore have a special need to avoid the over-use of harsh soaps and detergents, in order to prevent problems associated with dryness. Aged skin retains its fundamental ability to control water loss, but may partially lose this ability if the stratum corneum barrier becomes damaged by physical or chemical agents.

Many substances will penetrate aged skin more easily than young skin.As we grow older, the skin loses its firmness and elasticity. Patches of discoloration and areas of dilated blood vessels appear. On exposed areas of aged skin, such as the hands and face, the skin patterns are often markedly changed.

Reasons for the changing appearance:

* blood circulation slows down
* metabolism slows down
* chemical changes take place in the tissues
* sebaceous glands diminish in size and number
* collagen production breaks down
* hormone production is altered or reduced.

The Professional Facial

The professional facial is universally recognized as the most relaxing services available in the salon.
We enjoy the benefits to our skin as well as the esthetic sense of well being as the restful yet stimulating experience unfolds.

To get the best results from facials the client should come on a regular basis to maintain healthy skin and reverse environmental damage.

The professional Esthetician knows the techniques that must be applied in order to get the visible results that the client is looking for such as better skin tone, texture and overall appearance.

There are 2 categories of facials:
Preservative: for maintaining good health and
Corrective: for correcting skin conditions.

For a preservative facial, we focus on maintaining the good condition of our client using cleansing methods, increasing circulation, relaxing the nerves and activating the skin glands through manipulations.

For a corrective facial, we focus on correcting one or more facial conditions such as oiliness, dryness, blackheads, age lines and minor acne.

The benefits of a facial:
- Cleansing the skin
- Increasing circulation
- Activating glandular activity
- Relaxing the nerves
- Maintaining muscle tone
- Strengthening weak muscle tissue
- Correcting certain skin disorders
- Helping prevent the formation of wrinkles and age lines
- Softening and improving skin texture and complexion
- Adding to the client's confidence

The facial experience begins by helping the client to relax by speaking in a calming quiet manner.
A professional Esthetician will explain the benefits of the products and services and will answer any questions that the client may have.

In order for the client to relax, she must feel that she is in a calming environment.
The biggest key to a successful calming environment is quietness.

The ability to work quietly and efficiently brings confidence to the client that she will have a high quality experience.

The professional Esthetician will keep all work areas neat and clean and above all, sanitary. Disorganization can not be a part of the professional esthetician's environment.

Work habits must be above average setting high standards in all elements of client service.

Being sanitary with products by only using clean, disposable spatulas is the only way to guarantee that no products will be contaminated.

The product must not be contaminated inside the container by a used implement as well as the product must not be contaminated that is being used on the client.

Prearrange all implements that you will need prior to the arrival of your client. **Follow systematic procedures.**

Warm your hands before touching the client if you hands are cold and keep your nails smooth and free from anomalies that might scratch or injure your client.

The professional Esthetician will naturally develop their own list of favorite products and equipment as they achieve better results with what they use.

But there are basics on the list of items that are standards in the industry and that we can not do without.

The most useful items are as follows:
1) Absorbent cotton

2) Antiseptic lotion

3) Astringent

4) Clean sheet or other covering

5) Cleansing cream or lotion

6) Cleansing tissues

7) Cotton pads

8) Cotton swabs and pledgets

9) Facial steamer

10) Freshing lotion – mild astringent

11) Gauze for the mask

12) Head band or head covering

13) High frequency machine

14) Infrared lamp

15) Lubricating oil

16) Magnifying lamp

17) Makeup tray

18) Mask

19) Moisturizer and protective lotion

20) Safety and bobby pins

21) Salon gown

22) Spatulas

23) Sponges

24) Tissue strips

25) Towels

Gathering and organizing elements from the list above should never become a daunting task.

To the professional Esthetician, it is a pleasure to provide high quality services to our worthy clients in order to develop the reputation that we all aspire to.

The appreciation of the client is unmeasurable when they tell all of their friends what a great experience it was to be served in such an outstanding way.

For the client, it is easy to detect disorganization and unpreparedness.

This impression leads to an end result in which the client will never return.

The client may never show signs of dissatisfaction and you still may get your anticipated tip, but she will never call and make an appointment again if she is dissatisfied.

Repeat business is where you can see your diligence and consistency in the area of preparedness, organization, and sanitation pay off.

1. Prepare the client:

a) Please always greet the client with sincere tones and a least one compliment. This puts the client at ease in the warmth of your personal environment.

b) Even though the client may have been to your establishment many times, reminder her to remove all jewelry and store it in a safe place. Welcome her to keep her handbag nearby during the facial. This is a number one choice in the client's feeling of well being and security. And we know how many ladies "go nowhere" without their purses far behind.

c) And again, even though your client has been to your salon and could walk with blind folds on, still walk with her and show her to the dressing room and offer assistance if needed.

d) Place a clean towel across the back of the facial chair to prevent contact from the clients bare body parts. Not only is it unpleasant to feel cold vinyl against your bare shoulders, it has a definite impression of uncleanness and it is an unclean practice.

e) Seat the client and assist if needed, then place the towel across the clients chest. Cover the client with the sheet and fold the top edge of the towel over the sheet. Remove the client's shoes and tuck the sheet around their feet. If they have removed their shoes because your salon provides booties in the dressing room, simply tuck the sheet around their booted feet.

f) Fasten a headband lined with tissue, or a towel, or other head covering around the client's head to protect the hair. Turban designs are very popular and elasticized hair coverings are good as well. The fact that they are cloth or paper makes an acceptable alternative to towels.

Procedures for wrapping the clients head:

1. Fold the towel lengthwise from one of the top corners to the opposite lower corner, and place it over the headrest with the fold facing down. Place the towel on the headrest before the client enters the facial area. When the client is in a reclined position, the back of the head should nest on the towel, so that one side of the towel can be brought up to the center of the forehead to cover the hairline

2. With the other hand, bring the other side of the towel over the center and cross it over.

3. Use a regular bobby pin to hold the towel in place. Check to be sure that all stands of hair are tucked under the towel, earlobes are not bent , and the towel is no wrapped too tightly.

g) Remove lingerie straps from the client's shoulders. If client is given a strapless gown to wear, tuck the shoulder lingerie straps into the top of the gown.

h) Adjust the headrest, then lower the facial chair to a reclining position. Wash your hands

2.Analyze the client's skin.

a) Remove makeup to determine:

1. If the skin is dry, normal or oily
2. If fine lines or creases exist
3. If blackheads or acne are present
4. If broken capillaries are visible
5. If the skin texture is smooth or rough
6. If the skin's color is eventually

b) This will determine:

1.What products you will use
2.The areas of the face that need special attention
3.The amount of pressure for manipulations
4.If lubricating oil or cream is needed around the eyes
5.Equipment or apparatus to use

3. Apply cleansing cream

a) a tsp of cleansing cream or lotion should be used. Use your spatula to remove this from the container. Lend the cream or lotion with your fingers to soften it. Remove makeup with a moist cotton pad or soft tissue. Be gentle working around the eyes and mouth.

b) Start at the neck using both hands in a sweeping movements to spread the cleanser upward to the chin, jaws, cheeks and base of the nose to the temples, then along the side and the bridge of the nose. Use a circular motion with fingertips. Use upward sweeping movements between the brows and across the forehead to the temples

c) Take more cleanser and use long stokes to smooth down the neck chest and upper back

d) begin at the middle of the forehead and using fingertips and circular motion circle the eyes to the temples and back to the middle of the forehead

e) Then slide fingers down the nose to the upper lip to the temples and then the forehead – lightly down to the chin – then up the jawline to the temples and forehead

4. Remove the cleansing cream

a) Use tissues, warm moist towels, moist cotton pads, or facial sponges to remove the cleanser. Begin at the forehead and follow the contours of the face. After removal of the cleanser from the face then, proceed to the neck chest and back.

5. Steam the face

a) use warm moist towels or a facial steamer to open the pores. Steam opens pores to cleanse blackheads, makeup and other debris and helps to soften superficial lines and increases blood circulation

6. Apply manipulation cream

a) select for the skin type and use the same procedure as with the cleanser
b) add lubrication oil or cream around the eyes and on the neck

7. Give facial manipulations

a) Cover the clients eyes with cotton pads moistened with a mild astringent
b) Manipulate the face using proper procedures

8. Expose the face to infrared light during or after facial manipulations

a) Cover the clients eyes with cotton pads moistened with a mild astringent
b) Place the lamp at a comfortable distance from the face
c) Expose the face to infrared rays for 3 to 5 minutes

9. Remove manipulation cream

a) use tissues, moist towels, moist cleansing pads, or sponges.

10. Apply astringent or mild skin freshening lotion

a) Sponge the face with cotton pledgets moistened with the lotion

11. Apply mask formulated for the client's skin condition. Leave on 7 to 10 minutes.

12. Remove the mask with wet cotton pledgets or towels

13. Wipe the face with pledgets saturated with a mild astringent

14. Apply a moisturizer or protective lotion

15. Completion
    a) discard used disposable supplies
    b) close product containers tightly, clean them and put them away
    c) place used towels, coverlets, and head covers in appropriate containers
    d) tidy up
    e) wash and sanitize your hands

Professional Skin Care Products
Skin care products are designed specifically to improve the appearance and health of the skin. Knowledge of these products and their ingredients are key in successful esthetic service application and results.

Basic cleansers
The skin needs a less harsh choice for cleansing than regular soap. Soap can create dryness and can leave a film on skin, so the better alternatives are face washes, cleansing lotions and cleansing creams.

The face wash is a detergent based cleanser but is neutral in it's pH level. It foams like soap but is much gentler on the skin. It leaves the face with a tight feeling after rinsing but for those with **oily skin** it is often a good choice because it can get rid of oil.

The cleansing lotion is water based and is great for **normal to combination** skin.

The cleansing cream is oil based and is a first choice for makeup removal. It is also great for cleansing dry or aged skin. It must be applied and removed with sponges or clothes in order to completely remove residue.

Toners (tonic lotions)
Toners are astringents that are used after cleansing the skin and before moisturizers are applied. They can be applied with cotton pads or sprayed on . Toners vary in strengths containing different levels of alcohol.

Categories of Toners:
Fresheners have the lowest level of alcohol content, between 0% and 4% and are recommended for dry or aged skin.

Toners have a medium level of alcohol content, between 4% to 15% and are recommended for normal or combination skin. They tend to give the skin a tight feel.

Astringents have the highest alcohol content, between 15% to 35% and are recommended for very oily skin including acne conditions. It's easy to over dry the skin when using this level too often.

Masks and Packs:
For thousands of years beauty applications have included masks. They have always included ingredients such as herbs, vitamins and oils. Many have used seaweed and clay in their formulations due to the high content of nutrients. Skin conditions can be improved by using masks.

Setting masks contain ingredients that harden on the face.
Non-setting masks stay moist and do not harden.

Masks tighten skin, draw out impurities, hydrate, nourish, and soothe the skin.
As **clay masks** dry and harden, they draw out impurities. It stimulates circulation and contracts the pores of the skin.
These clay formulations contain silica, kaolin, and bentonite.
Commercially made **packs** remain moist and creamy and often contain aloe or seaweed which have healing properties.

Paraffin wax masks are used to promote penetration of ingredients by it's warming action. It increases blood circulation and has a softening effect on the skin.

Paraffin wax application procedure

1. melt the paraffin – set the warming unit temperature to just above body temperature
2. once melted, test the wax on your own wrist to insure a comfortable temperature has been achieved
3. Apply one coat of paraffin to the skin of the face and neck
4. Place pre-cut gauze over the first coat of wax
5. apply wax ¼ inch thick
6. cover the client's eyes with pads
7. the wax will harden after 15 to 20 minutes – use a wooden spatula to work the mask loose
8. lift the mask in one piece

Modelage masks
Modelage masks are a self-heating application.
When ingredients are mixed together and applied to the client a chemical reaction occurs that self-heats up to 105°F.
It takes 20 minutes to heat and then cool down on the client's face.

Moisturizers
After cleansing the skin, we apply moisturizer in order to protect and nourish.
All skin no matter what the type needs to be moisturized.
The formula of moisturizer is chosen according to the condition and type of the skin.
Moisturizers contain ingredients that help the skin retain it's moisture.

Product Ingredients
The following ingredients are found in skin care products.

- **Alcohol**: SD alcohol aka ethanol
- **Algae**: derived from minerals
- **Allantoin**: man-made chemical from uric acid – has healing qualities
- **Aloe**: from the aloe leaf – has hydrating, healing, antimicrobial and anti-inflammatory properties
- **Alum**: man-made compound – from aluminum, potassium or ammonium sulfate – stops bleeding
- **Azulene**: from the chamomile plant – anti-inflammatory properties
- **Benzyl peroxide**: drying properties
- **Calendula**: plant extract with anti-inflammatory properties
- **Carrot**: used to color and contains vitamin in it's oil
- **Chamomile**: plant extract with soothing properties
- **Collagen:** from cow placentas – a protein
- **Essential oils**: herb oils

- **Glycerine**: from oils or fats, used as a softener
- **Hyaluronic acid**: water binding properties
- **Jojoba**: lubricant, moisturizer
- **Lanolin**: sheep's wool derivative, emollient
- **Liposomes**: transporting delivery system of hollow spheres that carry nutrients to the skin
- **Mineral oil**: petroleum based, emollient
- **Parabens**: preservative
- **Silicone**: emollient that leaves a film
- **Sodium bicarbonate**: baking soda, use as a pH adjuster
- **Squalane**: derived from olives, nourishes
- **Sulfur**: reduces oil gland activity
- **Titanium dioxide**: blocks UV rays
- **Urea**: helps other substances penetrate into the skin
- **Witch Hazel**: ingredient in toner, astringent qualities, derived from bark
- **Zinc Oxide**: healing agent from zinc ore

Lesson 2 Summary

The cosmetic industry has a large selection of professional products for the Esthetician to chose from. The professional Esthetician will make her choices from these products in order to best serve the client's needs. The combination of knowing anatomy of the skin and recognizing skin conditions are irreplaceable in choosing the products used when performing a professional facial service. Results are strongly based on these factors.

Lesson 3: Health, Safety, and Welfare (2 hours)

Part 1: Sanitation and Sterilization

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.

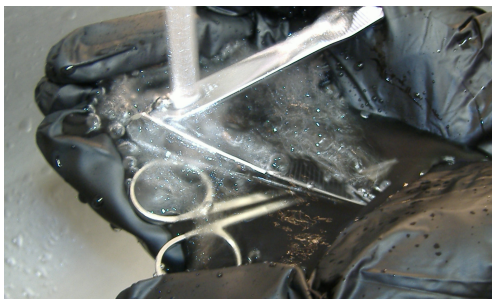


Illustration 2: Wash with soap and water

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.

Part 1 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 bacterial, 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.
In the following segment, we will discuss OSHA regulations.

Health, Safety, and Welfare

Part 2: Occupational Safety and Health Administration Regulations
Outline

- Hazard Communication Standard
- Safety Data Sheets
- Manufacturer's SDS
- Safety In The Workplace
- Employer's Best Practices

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
- describe the ways employers are required to provide a safe workplace
- identify aspects of filing a complaint
- e plain employer responsibilities in maintaining a safe workplace
- list the action steps in pre-assessment of hazards
- describe aspects of personal protective equipment

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.

A description of all 16 sections of the SDS, along with their contents, is presented below:

Section 1: Identification

This section identifies the chemical on the SDS as well as the recommended uses. It also provides the essential contact information of the supplier. The required information consists of:

- Product identifier used on the label and any other common names or synonyms by which the substance is known.
- Name, address, phone number of the manufacturer, importer, or other responsible party, and emergency phone number.
- Recommended use of the chemical (e.g., a brief description of what it actually does, such as flame retardant) and any restrictions on use (including recommendations given by the supplier).

Section 2: Hazard(s) Identification

This section identifies the hazards of the chemical presented on the SDS and the appropriate warning information associated with those hazards. The required information consists of:

- The hazard classification of the chemical (e.g., flammable liquid, category[1]).
- Signal word.
- Hazard statement(s).
- Pictograms (the pictograms or hazard symbols may be presented as graphical reproductions of the symbols in black and white or be a description of the name of the symbol (e.g., skull and crossbones, flame).
- Precautionary statement(s).
- Description of any hazards not otherwise classified.
- For a mixture that contains an ingredient(s) with unknown toxicity, a statement describing how much (percentage) of the mixture consists of ingredient(s) with unknown acute toxicity. Please note that this is a total percentage of the mixture and not tied to the individual ingredient(s).

Section 3: Composition/Information on Ingredients

This section identifies the ingredient(s) contained in the product indicated on the SDS, including impurities and stabilizing additives. This section includes information on substances, mixtures, and all chemicals where a trade secret is claimed. The required information consists of:

Substances

- Chemical name.
- Common name and synonyms.
- Chemical Abstracts Service (CAS) number and other unique identifiers.
- Impurities and stabilizing additives, which are themselves classified and which contribute to the classification of the chemical.

Mixtures

- Same information required for substances.
- The chemical name and concentration (i.e., exact percentage) of all ingredients which are classified as health hazards and are:
    - Present above their cut-off/concentration limits or
    - Present a health risk below the cut-off/concentration limits.
- The concentration (exact percentages) of each ingredient must be specified except concentration ranges may be used in the following situations:
    - A trade secret claim is made,
    - There is batch-to-batch variation, or
    - The SDS is used for a group of substantially similar mixtures.

Chemicals where a trade secret is claimed

- A statement that the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret is required.

Section 4: First-Aid Measures

This section describes the initial care that should be given by untrained responders to an individual who has been exposed to the chemical. The required information consists of:

- Necessary first-aid instructions by relevant routes of exposure (inhalation, skin and eye contact, and ingestion).
- Description of the most important symptoms or effects, and any symptoms that are acute or delayed.
- Recommendations for immediate medical care and special treatment needed, when necessary.

Section 5: Fire-Fighting Measures

This section provides recommendations for fighting a fire caused by the chemical. The required information consists of:

- Recommendations of suitable extinguishing equipment, and information about extinguishing equipment that is not appropriate for a particular situation.
- Advice on specific hazards that develop from the chemical during the fire, such as any hazardous combustion products created when the chemical burns.
- Recommendations on special protective equipment or precautions for firefighters.

Section 6: Accidental Release Measures

This section provides recommendations on the appropriate response to spills, leaks, or releases, including containment and cleanup practices to prevent or minimize exposure to people, properties, or

the environment. It may also include recommendations distinguishing between responses for large and small spills where the spill volume has a significant impact on the hazard. The required information may consist of recommendations for:

- Use of personal precautions (such as removal of ignition sources or providing sufficient ventilation) and protective equipment to prevent the contamination of skin, eyes, and clothing.
- Emergency procedures, including instructions for evacuations, consulting experts when needed, and appropriate protective clothing.
- Methods and materials used for containment (e.g., covering the drains and capping procedures).
- Cleanup procedures (e.g., appropriate techniques for neutralization, decontamination, cleaning or vacuuming; adsorbent materials; and/or equipment required for containment/clean up)

Section 7: Handling and Storage

This section provides guidance on the safe handling practices and conditions for safe storage of chemicals. The required information consists of:

- Precautions for safe handling, including recommendations for handling incompatible chemicals, minimizing the release of the chemical into the environment, and providing advice on general hygiene practices (e.g., eating, drinking, and smoking in work areas is prohibited).
- Recommendations on the conditions for safe storage, including any incompatibilities. Provide advice on specific storage requirements (e.g., ventilation requirements)

Section 8: Exposure Controls/Personal Protection

This section indicates the exposure limits, engineering controls, and personal protective measures that can be used to minimize worker exposure. The required information consists of:

- OSHA Permissible Exposure Limits (PELs), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available.
- Appropriate engineering controls (e.g., use local exhaust ventilation, or use only in an enclosed system).
- Recommendations for personal protective measures to prevent illness or injury from exposure to chemicals, such as personal protective equipment (PPE) (e.g., appropriate types of eye, face, skin or respiratory protection needed based on hazards and potential exposure).
- Any special requirements for PPE, protective clothing or respirators

Section 9: Physical and Chemical Properties

This section identifies physical and chemical properties associated with the substance or mixture. The minimum required information consists of:

- Appearance (physical state, color, etc.);
- Upper/lower flammability or explosive limits;
- Odor;
- Vapor pressure;
- Odor threshold;
- Vapor density;

- pH;
- Relative density;
- Melting point/freezing point;
- Solubility(ies);
- Initial boiling point and boiling range;
- Flash point;
- Evaporation rate;
- Flammability (solid, gas);
- Partition coefficient: n-octanol/water;
- Auto-ignition temperature;
- Decomposition temperature; and
- Viscosity.

The SDS may not contain every item on the above list because information may not be relevant or is not available. When this occurs, a notation to that effect must be made for that chemical property. Manufacturers may also add other relevant properties, such as the dust deflagration index (Kst) for combustible dust, used to evaluate a dust's explosive potential

Section 10: Stability and Reactivity

This section describes the reactivity hazards of the chemical and the chemical stability information. This section is broken into three parts: reactivity, chemical stability, and other. The required information consists of:

Reactivity

- Description of the specific test data for the chemical(s). This data can be for a class or family of the chemical if such data adequately represent the anticipated hazard of the chemical(s), where available.

Chemical stability

- Indication of whether the chemical is stable or unstable under normal ambient temperature and conditions while in storage and being handled.
- Description of any stabilizers that may be needed to maintain chemical stability.
- Indication of any safety issues that may arise should the product change in physical appearance.

Other

- Indication of the possibility of hazardous reactions, including a statement whether the chemical will react or polymerize, which could release excess pressure or heat, or create other hazardous conditions. Also, a description of the conditions under which hazardous reactions may occur.
- List of all conditions that should be avoided (e.g., static discharge, shock, vibrations, or environmental conditions that may lead to hazardous conditions).
- List of all classes of incompatible materials (e.g., classes of chemicals or specific substances) with which the chemical could react to produce a hazardous situation.
- List of any known or anticipated hazardous decomposition products that could be produced because of use, storage, or heating. (Hazardous combustion products should also be included in Section 5 (Fire-Fighting Measures) of the SDS.)

Section 11: Toxicological Information

This section identifies toxicological and health effects information or indicates that such data are not available. The required information consists of:

- Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact). The SDS should indicate if the information is unknown.
- Description of the delayed, immediate, or chronic effects from short- and long-term exposure.
- The numerical measures of toxicity (e.g., acute toxicity estimates such as the LD50 (median lethal dose)) - the estimated amount [of a substance] expected to kill 50% of test animals in a single dose.
- Description of the symptoms. This description includes the symptoms associated with exposure to the chemical including symptoms from the lowest to the most severe exposure.
- Indication of whether the chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions) or found to be a potential carcinogen by OSHA

Section 12: Ecological Information (non-mandatory)

This section provides information to evaluate the environmental impact of the chemical(s) if it were released to the environment. The information may include:

- Data from toxicity tests performed on aquatic and/or terrestrial organisms, where available (e.g., acute or chronic aquatic toxicity data for fish, algae, crustaceans, and other plants; toxicity data on birds, bees, plants).
- Whether there is a potential for the chemical to persist and degrade in the environment either through biodegradation or other processes, such as oxidation or hydrolysis.
- Results of tests of bioaccumulation potential, making reference to the octanol-water partition coefficient (Kow) and the bioconcentration factor (BCF), where available.
- The potential for a substance to move from the soil to the groundwater (indicate results from adsorption studies or leaching studies).
- Other adverse effects (e.g., environmental fate, ozone layer depletion potential, photochemical ozone creation potential, endocrine disrupting potential, and/or global warming potential).

Section 13: Disposal Considerations (non-mandatory)

This section provides guidance on proper disposal practices, recycling or reclamation of the chemical(s) or its container, and safe handling practices.
To minimize exposure, this section should also refer the reader to Section 8 (Exposure Controls/Personal Protection) of the SDS. The information may include:

- Description of appropriate disposal containers to use.
- Recommendations of appropriate disposal methods to employ.
- Description of the physical and chemical properties that may affect disposal activities.
- Language discouraging sewage disposal.
- Any special precautions for landfills or incineration activities

Section 14: Transport Information (non-mandatory)

This section provides guidance on classification information for shipping and transporting of hazardous chemical(s) by road, air, rail, or sea. The information may include:

- UN number (i.e., four-figure identification number of the substance)[1].
- UN proper shipping name[1].
- Transport hazard class(es)[1].
- Packing group number, if applicable, based on the degree of hazard[2].
- Environmental hazards (e.g., identify if it is a marine pollutant according to the International Maritime Dangerous Goods Code (IMDG Code)).
- Guidance on transport in bulk (according to Annex II of MARPOL 73/78[3] and the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (International Bulk Chemical Code (IBC Code)).
- Any special precautions which an employee should be aware of or needs to comply with, in connection with transport or conveyance either within or outside their premises (indicate when information is not available).

Section 15: Regulatory Information (non-mandatory)

This section identifies the safety, health, and environmental regulations specific for the product that is not indicated anywhere else on the SDS. The information may include:

- Any national and/or regional regulatory information of the chemical or mixtures (including any OSHA, Department of Transportation, Environmental Protection Agency, or Consumer Product Safety Commission regulations)

Section 16: Other Information

This section indicates when the SDS was prepared or when the last known revision was made. The SDS may also state where the changes have been made to the previous version. You may wish to contact the supplier for an explanation of the changes. Other useful information also may be included here.

Who Must Conduct Hazard Classifications?

Only chemical manufacturers and importers are required to perform hazard classifications on the chemicals they produce or import. Under the HCS, an employer that manufactures, processes, formulates, blends, mixes, repackages, or otherwise changes the composition of a hazardous chemical is considered a "chemical manufacturer."

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 (lbs)	SARA 302 TPQ (gallons)	SARA 304 RQ (lbs)	SARA 304 RQ (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

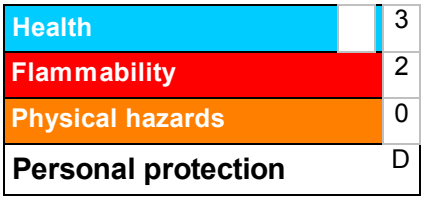
Corrosive CAUSES SKIN BURNS.

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.) :



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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Version : 3

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.

CSPA Product Care®

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Safety In The Workplace

Know Your Rights

Under federal law, you are entitled to a safe workplace. Your employer must provide a workplace free of known health and safety hazards. If you have concerns, you have the right to speak up about them without fear of retaliation. You also have the right to:

- Be trained in a language you understand
- Work on machines that are safe
- Be provided required safety gear, such as gloves or a harness and lifeline for falls
- Be protected from toxic chemicals
- Request an OSHA inspection, and speak to the inspector
- Report an injury or illness, and get copies of your medical records
- See copies of the workplace injury and illness log
- Review records of work-related injuries and illnesses
- Get copies of test results done to find hazards in the workplace

When to File a Complaint

- Safety and Health Complaint
  If you believe working conditions are unsafe or unhealthful, you may file a confidential complaint with OSHA and ask for an inspection. If possible, bring the conditions to your employer's attention.

How to File a Safety and Health Complaint

The Occupational Safety and Health Act of 1970 gives employees and their representatives the right to file a complaint and request an OSHA inspection of their workplace if they believe there is a serious hazard or their employer is not following OSHA standards. Workers do not have to know whether a specific OSHA standard has been violated in order to file a complaint. The complaint should be filed as soon as possible after noticing the hazard or lack of compliance because OSHA citations may only be issued for violations that currently exist or existed in the past 6 months.

Complaints from workers or their representatives are taken seriously by OSHA. OSHA will keep your information confidential. Complaint Filing Options are: Online – Fax/Mail – or Telephone – your local OSHA Regional or Area Office.

Protection from Retaliation

It is illegal for an employer to fire, demote, transfer or otherwise retaliate against a worker for using their rights under the law. If you believe you have been retaliated against in any way, file a whistleblower complaint within 30 days of the alleged retaliation.

What should I do if there is a dangerous situation at work?

If you believe working conditions are unsafe or unhealthful, you may file a complaint with OSHA concerning a hazardous working condition at any time. If possible, bring the conditions to your employer's attention.

What if I am injured on the job?

If you are injured, call a supervisor for help. If the supervisor is not available, get medical assistance or call 911. All employers must notify OSHA within 8 hours of a workplace fatality or within 24 hours of any work-related inpatient hospitalization, amputation or loss of an eye. [Employers under federal OSHA's jurisdiction were required to begin reporting by Jan. 1, 2015. Establishments in a state with a state-run OSHA program may have a different implementation date].

Can someone file a complaint on my behalf?

Yes, a compliant can be filed on your behalf by: an authorized representative of a labor organization or other employee bargaining unit; an attorney; any person acting as a bona fide representative, including members of the clergy, social workers, spouses and other family members; government officials or nonprofit groups; and organizations acting upon specific complaints and injuries from you or your coworkers. In addition, anyone who knows about a workplace safety or health hazard may report unsafe conditions to OSHA, and OSHA will investigate the concerns reported.

What happens after I file a complaint?

Each complaint is evaluated by OSHA to determine whether it should be handled as an off-site investigation or an on-site inspection. Written complaints (or filed online) that are signed by workers or their representative and submitted to an OSHA area or regional office are more likely to result in on-site OSHA inspections.

What are my Employer's responsibilities?

Employer Responsibilities
Under the OSH law, employers have a responsibility to provide a safe workplace. This is a short summary of key employer responsibilities:

- Provide a workplace free from serious recognized hazards and comply with standards, rules and regulations issued under the OSH Act.
- Examine workplace conditions to make sure they conform to applicable OSHA standards.
- Make sure employees have and use safe tools and equipment and properly maintain this equipment.
- Use color codes, posters, labels or signs to warn employees of potential hazards.
- Establish or update operating procedures and communicate them so that employees follow safety and health requirements.
- Employers must provide safety training in a language and vocabulary workers can understand.
- Employers with hazardous chemicals in the workplace must develop and implement a written hazard communication program and train employees on the hazards they are exposed to and proper precautions (and a copy of safety data sheets must be readily available).
- Provide medical examinations and training when required by OSHA standards.
- Post, at a prominent location within the workplace, the OSHA poster (or the state-plan equivalent) informing employees of their rights and responsibilities.
- Report to the nearest OSHA office all work-related fatalities within 8 hours, and all work-related inpatient hospitalizations, all amputations and all losses of an eye within 24 hours.
- Keep records of work-related injuries and illnesses. (Note: Employers with 10 or fewer employees and employers in certain low-hazard industries are exempt from this requirement.

- Provide employees, former employees and their representatives access to the Log of Work-Related Injuries and Illnesses (OSHA Form 300). On February 1, and for three months, covered employers must post the summary of the OSHA log of injuries and illnesses (OSHA Form 300A).
- Provide access to employee medical records and exposure records to employees or their authorized representatives.
- Provide to the OSHA compliance officer the names of authorized employee representatives who may be asked to accompany the compliance officer during an inspection.
- Not discriminate against employees who exercise their rights under the Act. See our "Whistleblower Protection" webpage.
- Post OSHA citations at or near the work area involved. Each citation must remain posted until the violation has been corrected, or for three working days, whichever is longer. Post abatement verification documents or tags.
- Correct cited violations by the deadline set in the OSHA citation and submit required abatement verification documentation.
- OSHA encourages all employers to adopt an Injury and Illness Prevention Program. Injury and Illness Prevention Programs, known by a variety of names, are universal interventions that can substantially reduce the number and severity of workplace injuries and alleviate the associated financial burdens on U.S. workplaces.

What are my rights during an inspection?

When the OSHA inspector arrives, workers and their representatives have the right to talk privately with the OSHA inspector before and after the inspection. A worker representative may also go along on the inspection. Where there is no union or employee representative, the OSHA inspector must talk confidentially with a reasonable number of workers during the course of the investigation.

Does my employer have to provide Personal Protective Equipment (PPE) and who pays for it?

Many OSHA standards require employers to provide personal protective equipment, when it is necessary to protect employees from job-related injuries, illnesses, and fatalities. With few exceptions, OSHA requires employers to pay for personal protective equipment when it is used to comply with OSHA standards. These typically include: hard hats, gloves, goggles, safety glasses, welding helmets and goggles, face shields, chemical protective equipment and fall protection equipment.

Employer's Best Practices

OSHA has recently updated the Guidelines for Safety and Health Programs it first released 30 years ago, to reflect changes in the economy, workplaces, and evolving safety and health issues. The new Recommended Practices have been well received by a wide variety of stakeholders and are designed to be used in a wide variety of small and medium-sized business settings. The Recommended Practices present a step-by-step approach to implementing a safety and health program, built around six core elements that make up a successful program.

The main goal of safety and health programs is to prevent workplace injuries, illnesses, and deaths, as well as the suffering and financial hardship these events can cause for workers, their families, and employers. The recommended practices use a proactive approach to managing workplace safety and health.

Traditional approaches are often reactive –that is, problems are addressed only after a worker is injured or becomes sick, a new standard or regulation is published, or an outside inspection finds a problem that must be fixed. These recommended practices recognize that finding and fixing hazards before they cause injury or illness is a far more effective approach. The idea is to begin with a basic program and simple goals and grow from there. If you focus on achieving goals, monitoring performance, and evaluating outcomes, your workplace can progress along the path to higher levels of safety and health achievement. Employers will find that implementing these recommended practices also brings other benefits. Safety and health programs help businesses:

- Prevent workplace injuries and illnesses
- Improve compliance with laws and regulations
- Reduce costs, including significant reductions in workers' compensation premiums
- Engage workers
- Enhance their social responsibility goals
- Increase productivity and enhance overall business operations

Hazard Identification and Assessment

One of the "root causes" of workplace injuries, illnesses, and incidents is the failure to identify or recognize hazards that are present, or that could have been anticipated. A critical element of any effective safety and health program is a proactive, ongoing process to identify and assess such hazards.

To identify and assess hazards, employers and workers:

- Collect and review information about the hazards present or likely to be present in the workplace.
- Conduct initial and periodic workplace inspections of the workplace to identify new or recurring hazards.
- Investigate injuries, illnesses, incidents, and close calls/near misses to determine the underlying hazards, their causes, and safety and health program shortcomings.
- Group similar incidents and identify trends in injuries, illnesses, and hazards reported.
- Consider hazards associated with emergency or nonroutine situations.
- Determine the severity and likelihood of incidents that could result for each hazard identified, and use this information to prioritize corrective actions.

Action item 1: Collect existing information about workplace hazards Information on workplace hazards may already be available to employers and workers, from both internal and external sources.

How to accomplish it
Collect, organize, and review information with workers to determine what types of hazards may be present and which workers may be exposed or potentially exposed. Information available in the workplace may include:

- Equipment and machinery operating manuals.
- Safety Data Sheets (SDS) provided by chemical manufacturers.
- Self-inspection reports and inspection reports from insurance carriers, government agencies, and consultants.
- Records of previous injuries and illnesses, such as OSHA 300 and 301 logs and reports of incident investigations.

- Workers' compensation records and reports.
- Patterns of frequently-occurring injuries and illnesses.
- Exposure monitoring results, industrial hygiene assessments, and medical records (appropriately redacted to ensure patient/worker privacy).
- Existing safety and health programs (lockout/tagout, confined spaces, process safety management, personal protective equipment, etc.).
- Input from workers, including surveys or minutes from safety and health committee meetings.
- Results of job hazard analyses, also known as job safety analyses.

Information about hazards may be available from outside sources, such as:

- OSHA, National Institute for Occupational Safety and Health (NIOSH), and Centers for Disease Control and Prevention (CDC) websites, publications, and alerts.
- Trade associations.
- Labor unions, state and local occupational safety and health committees/coalitions ("COSH groups"), and worker advocacy groups.
- Safety and health consultants.

Action item 2: Inspect the workplace for safety hazards
Hazards can be introduced over time as workstations and processes change, equipment or tools become worn, maintenance is neglected, or housekeeping practices decline. Setting aside time to regularly inspect the workplace for hazards can help identify shortcomings so that they can be addressed before an incident occurs.

How to accomplish it

- Conduct regular inspections of all operations, equipment, work areas and facilities. Have workers participate on the inspection team and talk to them about hazards that they see or report.
- Be sure to document inspections so you can later verify that hazardous conditions are corrected. Take photos or video of problem areas to facilitate later discussion and brainstorming about how to control them, and for use as learning aids.
- Include all areas and activities in these inspections, such as storage and warehousing, facility and equipment maintenance, purchasing and office functions, and the activities of on-site contractors, subcontractors, and temporary employees.
- Regularly inspect both plant vehicles (e.g., forklifts, powered industrial trucks) and transportation vehicles (e.g., cars, trucks).
- Use checklists that highlight things to look for. Typical hazards fall into several major categories, such as those listed below; each workplace will have its own list:
    - General housekeeping
    - Slip, trip, and fall hazards
    - Electrical hazards
    - Equipment operation
    - Equipment maintenance
    - Fire protection
    - Work organization and process flow (including staffing and scheduling)
    - Work practices
    - Workplace violence

    - Ergonomic problems
    - Lack of emergency procedures
- Before changing operations, workstations, or workflow; making major organizational changes; or introducing new equipment, materials, or processes, seek the input of workers and evaluate the planned changes for potential hazards and related risks.

Note: Many hazards can be identified using common knowledge and available tools. For example, you can easily identify and correct hazards associated with broken stair rails and frayed electrical cords. Workers can be a very useful internal resource, especially if they are trained in how to identify and assess risks.

Action item 3: Identify health hazards

Identifying workers' exposure to health hazards is typically more complex than identifying physical safety hazards. For example, gases and vapors may be invisible, often have no odor, and may not have an immediately noticeable harmful health effect. Health hazards include chemical hazards (solvents, adhesives, paints, toxic dusts, etc.), physical hazards (noise, radiation, heat, etc.), biological hazards (infectious diseases), and ergonomic risk factors (heavy lifting, repetitive motions, vibration). Reviewing workers' medical records (appropriately redacted to ensure patient/worker privacy) can be useful in identifying health hazards associated with workplace exposures.

How to accomplish it

- Identify chemical hazards –review SDS and product labels to identify chemicals in your workplace that have low exposure limits, are highly volatile, or are used in large quantities or in unventilated spaces. Identify activities that may result in skin exposure to chemicals.
- Identify physical hazards –identify any exposures to excessive noise (areas where you must raise your voice to be heard by others), elevated heat (indoor and outdoor), or sources of radiation (radioactive materials, X-rays, or radiofrequency radiation).
- Identify biological hazards –determine whether workers may be exposed to sources of infectious diseases, molds, toxic or poisonous plants, or animal materials (fur or scat) capable of causing allergic reactions or occupational asthma.
- Identify ergonomic risk factors –examine work activities that require heavy lifting, work above shoulder height, repetitive motions, or tasks with significant vibration.
- Conduct quantitative exposure assessments –when possible, using air sampling or direct reading instruments.
- Review medical records –to identify cases of musculoskeletal injuries, skin irritation or dermatitis, hearing loss, or lung disease that may be related to workplace exposures.

Note: Identifying and assessing health hazards may require specialized knowledge. Small businesses can obtain free and confidential occupational safety and health advice services, including help identifying and assessing workplace hazards, through OSHA's On-site Consultation Program.

Action item 4: Conduct incident investigations

Workplace incidents –including injuries, illnesses, close calls/near misses, and reports of other concerns– provide a clear indication of where hazards exist. By thoroughly investigating incidents and reports, you will identify hazards that are likely to cause future harm.

The purpose of an investigation must always be to identify the root causes (and there is often more than one) of the incident or concern, in order to prevent future occurrences.

How to accomplish it

- Develop a clear plan and procedure for conducting incident investigations, so that an investigation can begin immediately when an incident occurs. The plan should cover items such as:
    - Who will be involved
    - Lines of communication
    - Materials, equipment, and supplies needed
    - Reporting forms and templates
- Train investigative teams on incident investigation techniques, emphasizing objectivity and open-mindedness throughout the investigation process.
- Conduct investigations with a trained team that includes representatives of both management and workers.
- Investigate close calls/near misses.
- Identify and analyze root causes to address underlying program shortcomings that allowed the incidents to happen.
- Communicate the results of the investigation to managers, supervisors, and workers to prevent recurrence.

Effective incident investigations do not stop at identifying a single factor that triggered an incident. They ask the questions "Why?" and "What led to the failure?" For example, if a piece of equipment fails, a good investigation asks: "Why did it fail?" "Was it maintained properly?" "Was it beyond its service life?" and "How could this failure have been prevented?" Similarly, a good incident investigation does not stop when it concludes that a worker made an error. It asks such questions as: "Was the worker provided with appropriate tools and time to do the work?" "Was the worker adequately trained?" and "Was the worker properly supervised?"

Note: OSHA has special reporting requirements for work-related incidents that lead to serious injury or a fatality (29 CFR 1904.39). OSHA must be notified within 8 hours of a work-related fatality, and within 24 hours of an amputation, loss of an eye, or inpatient hospitalization.

Action item 5: Identify hazards associated with emergency and nonroutine situations
Emergencies present hazards that need to be recognized and understood. Nonroutine or infrequent tasks, including maintenance and startup/shutdown activities, also present potential hazards. Plans and procedures need to be developed for responding appropriately and safely to hazards associated with foreseeable emergency scenarios and nonroutine situations.

How to accomplish it

- Identify foreseeable emergency scenarios and nonroutine tasks, taking into account the types of material and equipment in use and the location within the facility. Scenarios such as the following may be foreseeable:
    - Fires and explosions
    - Chemical releases
    - Hazardous material spills
    - Startups after planned or unplanned equipment shutdowns
    - Nonroutine tasks, such as infrequently performed maintenance activities
    - Structural collapse
    - Disease outbreaks
    - Weather emergencies and natural disasters

- Medical emergencies
- Workplace violence

Action item 6: Characterize the nature of identified hazards, identify interim control measures, and prioritize the hazards for control The next step is to assess and understand the hazards identified and the types of incidents that could result from worker exposure to those hazards. This information can be used to develop interim controls and to prioritize hazards for permanent control.

How to accomplish it

- Evaluate each hazard by considering the severity of potential outcomes, the likelihood that an event or exposure will occur, and the number of workers who might be exposed.
- Use interim control measures to protect workers until more permanent solutions can be implemented.
- Prioritize the hazards so that those presenting the greatest risk are addressed first. Note, however, that employers have an ongoing obligation to control all serious recognized hazards and to protect workers.

Note: "Risk" is the product of hazard and exposure. Thus, risk can be reduced by controlling or eliminating the hazard or by reducing workers' exposure to hazards.

Personal Protective Equipment

What is personal protective equipment?

Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Personal protective equipment may include items such as ***gloves***, ***safety glasses*** and shoes, earplugs or muffs, hard hats, respirators, or coveralls, vests and full body suits.

Illustration 1: Gloves

What can be done to ensure proper use of personal protective equipment?

All personal protective equipment should be safely designed and constructed, and should be maintained in a clean and reliable fashion. It should fit comfortably, encouraging worker use. If the personal protective equipment does not fit properly, it can make the difference between being safely covered or dangerously exposed.


Illustration 2: Goggles

Employers must provide personal protective equipment to their workers and ensure its proper use. Employers are also required to train each worker required to use personal protective equipment to know:

- When it is necessary
- What kind is necessary
- How to properly put it on, adjust, wear and take it off
- The limitations of the equipment
- Proper care, maintenance, useful life, and disposal of the equipment

HCS Pictograms, Signal Words, and Hazards

As of June 1, 2015, the Hazard Communication Standard (HCS) will require pictograms on labels to alert users of the chemical hazards to which they may be exposed. Each pictogram consists of a symbol on a white background framed within a red border and represents a distinct hazard(s). ***The pictogram on the label is determined by the chemical hazard classification. The "Signal Word" further describes and labels the classification.***

Health Hazard

- Carcinogen
- Mutagenicity
- Reproductive Toxicity
- Respiratory Sensitizer
- Target Organ Toxicity
- Aspiration Toxicity

Flame

- Flammables
- Pyrophorics
- Self-Heating
- Emits Flammable Gas
- Self-Reactives
- Organic Peroxides

Exclamation Mark

- Irritant (skin and eye)
- Skin Sensitizer
- Acute Toxicity (harmful)
- Narcotic Effects
- Respiratory Tract Irritant
- Hazardous to Ozone Layer (Non-Mandatory

Gas Cylinder

- Gases Under Pressure

Corrosion

- Skin Corrosion/Burns
- Eye Damage
- Corrosive to Metals

Exploding Bomb

- Explosives
- Self-Reactives
- Organic Peroxides

Flame Over Circle

- Oxidizers

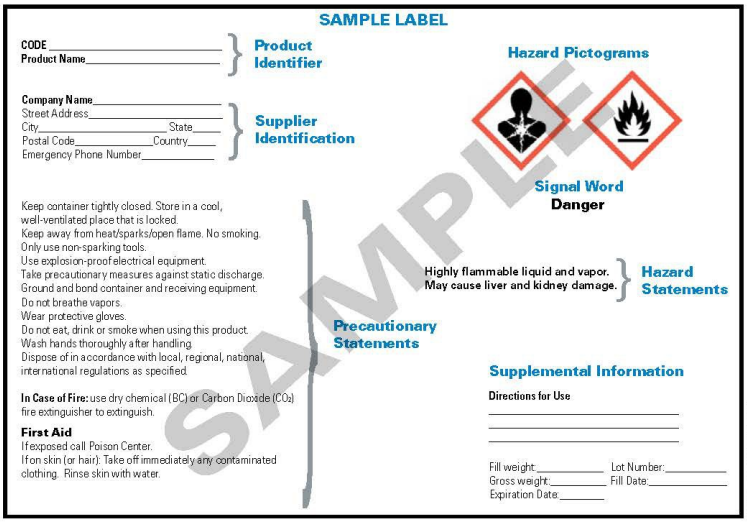
Environment (Non-Mandatory)

- Aquatic Toxicity

Skull and Crossbones

- Acute Toxicity (fatal or toxic)

Sample Label



Part 2 Summary
In this segment 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. We can now describe factors regarding safety in the workplace and how employers observe safe practices.

Course Summary
In this Course we have thoroughly discussed important facts about the Skin, and topics involving Health, Safety, and Wellbeing. It is recommended that personal service workers, such as salon professionals, stay up to date on any changes or improvements made by OSHA, and Federal and State agencies who regulate safety standards.

Resources and References

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Centers for Disease Control and Prevention https://www.cdc.gov/

U.S. Department of Health and Human Services https://householdproducts.nlm.nih.gov/

U.S. Environmental Protection Agency https://www.epa.gov/

United State Department of Labor Occupational and Health Administration https://www.osha.gov/

WebMD https://www.webmd.com

dictionary.com

Google

Encyclopedia.com

"Parasites." UXL Encyclopedia of Science. . Encyclopedia.com. <http://www.encyclopedia.com>.

"Lice Infestation." Gale Encyclopedia of Children's Health: Infancy through Adolescence. . Encyclopedia.com. <http://www.encyclopedia.com>.

Wikipedia https://www.wikipedia.org/ a

Milady Standard Cosmetology, 13th Edition ©2016 ISBN-13: 9781285769417 Milady Publishing Company (2016). Clifton Park, NY: Cengage Learning.