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Cleaning, Sanitizing, and Disinfecting Toolkit

This policy aims to establish guidelines and procedures for the appropriate use of hand sanitizers in Nature School settings to promote a safe and healthy environment for children, staff, and parents. It aligns with the health and safety regulations set forth by Canada Island Health.

Contents

Children are more sensitive to the health effects of toxic chemicals

Fetuses and very young children are particularly sensitive to the effects of toxic chemicals. During early development, growth is rapid and organs, especially the brain, are developing. In the US and Canada, researchers estimate that 5% of childhood cancer and 30% of childhood asthma are related to chemical exposures. The President's Cancer Panel noted in 2010, "the true burden of environmentally induced cancer has been grossly underestimated."

Health effects from exposure to toxic chemicals may not show up for years or even decades. Unlike adults, children have many years to develop illnesses caused by early exposures to toxic chemicals. It is important to practice the "precautionary principle" and protect children from potential health effects, even if some cause and effect relationships are not yet fully proven.

Many new products are marketed with terms such as "green" to make the public think they are safer. However, there is no legal definition of these terms, and when they are used on a product label, they do not assure that a product is safe. Fortunately, there are independent organizations and government agencies working to review cleaning products in order to identify products that are effective and safer for human health, wildlife, and the environment. This Toolkit will help you make good choices about products and tools to use in your program.

What is the difference between cleaning, sanitizing, and disinfecting?

Cleaning is done with water, a cleaning product, and scrubbing. Cleaning does not kill bacteria, viruses, or fungi, which are generally referred to as "germs." Cleaning products are used to remove germs, dirt, and other organic material by washing them down the drain.

Sanitizing and disinfecting products are chemicals that work by *killing germs*. These chemicals are also called antimicrobial pesticides. They are regulated by the California Department of Pesticide Regulation (or similar agencies in other states) and the U.S. Environmental Protection Agency (EPA). Disinfectants kill more germs than sanitizers. In most cases, a cleaning product is used first. Then the surface is either sanitized or disinfected when it is necessary.

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What is an infectious disease?

Infectious diseases are caused by germs (also called microbes or microorganisms) that get into our bodies and reproduce, causing symptoms that make us feel sick. They can spread from one person (or animal) to another when germs leave one body and get into another. Sometimes infectious diseases are also called communicable or contagious diseases. Microbes that cause disease are called pathogens.

Infectious diseases are common in ECE. Studies show that some young children in ECE have symptoms of infectious illness one-third to onehalf of the days in a year!

There are different kinds of germs

Viruses are the most common cause of illness. They are very small. Viruses can't live on surfaces for very long. The common cold is a group of symptoms caused by 200 different viruses. This is why young children get 8–10 colds a year. There are always more cold viruses that they haven't had yet! Viruses also cause intestinal and respiratory flu. Antibiotics kill bacteria but cannot kill viruses! They should not be used to treat illnesses caused by viruses. Luckily, we get better from most viral illnesses without medical treatment.

Bacteria are more complex than viruses. They can live and reproduce independently. Some can survive on surfaces for a long time, feeding off dirt or food and water. Most are harmless or even beneficial to us. They help us to digest food as well as prevent infections caused by harmful bacteria. Common bacterial infections include some ear infections, some cases of diarrhea, strep throat, and urinary tract infections. Bacteria can also cause more serious infections such as tuberculosis, whooping cough, staph infections, bacterial pneumonia, and bacterial meningitis. Some bacteria – for example, methicillin-resistant Staphylococcus aureus (MRSA) – have developed ways to resist antibiotics and can cause serious infectious diseases that are hard to treat. Bacteria often attach to surfaces, especially moist ones, and form dense mats called biofilm. Bacteria in biofilms are much harder to kill. Keeping surfaces clean and dry prevents biofilms from developing.

When we kill germs on a surface with a chemical disinfectant, it is important to think of this as temporary. The surface will be home to new germs as soon as it is touched by hands, or sneezed or coughed on. Bacteria can grow and divide very fast. They can double in number in 10 minutes when they have food and water. Fungi, including yeasts and molds, are everywhere. They can survive on surfaces for long periods.

Fungi can cause common skin infections such as:

- diaper rash
- thrush in babies' mouths
- ringworm
- athlete's foot
- scalp infections, such as tinea capitis, and nail infections

These infections are bothersome and can sometimes take months to go away, but they don't cause serious illness in children with healthy immune systems. They also don't spread and cause infection in the rest of the body in healthy people.

Mold can be found anywhere there is constant moisture, like bathrooms and kitchens. You cannot "catch" mold from another person. Mold can cause irritations of the eye, skin, nose, throat, and lungs, and can trigger asthma. It can produce an allergic reaction in some people. The best way to control mold indoors is to get rid of moisture and leaks.

Parasites are larger than bacteria. They enter our bodies through contaminated food or by penetrating our skin. They are common in developing nations around the world. A few parasites infect children in the United States. The three main parasites that are sometimes seen in ECE are:

- giardia, which is spread by
  - drinking water that contains the giardia parasite;
  - the fecal-oral route;
- pinworms, which are also spread by the fecal-oral route;
- scabies, which are mainly spread by skinto-skin contact and may be transmitted by objects.

Insects, though not germs, can also spread infectious diseases. West Nile virus and Western equine encephalitis are uncommon diseases that do occur in the United States and are spread by mosquito bites. Lyme disease and Babesiosis are diseases spread by tick bites.

Head lice, scabies, and bed bugs bite the human body and cause skin reactions. They can spread from person to person when they hitchhike from one body to another or, in the case of bed bugs, can be carried on luggage or bedding. Fortunately, these infestations are only annoying. These insects do not carry serious diseases that can infect humans.

Where do we find germs in our bodies?

Bacteria and viruses are found in our body fluids:

- blood
- mucus
- saliva
- vomit
- stool (feces)
- urine
- discharges from the eyes and skin lesions

A good rule to remember: if it's wet and comes from someone else's body, it can be infectious. Some germs cause an infection in the upper respiratory system (a URI).

A cold is a URI. Other germs infect the gastrointestinal system and cause vomiting and diarrhea. Some, like the flu, can cause both. These types of infectious diseases are the most common in ECE. 5

GERMS: THE GOOD SIDE

Not all microbes cause disease. Bacteria, viruses, and fungi are part of the ecosystems of our bodies. We're made up of 10 times as many microbial cells as human cells! All of the microbes in our body together weigh 3 pounds – as much as our brains! This collection of microbes is called our biome. We need our biome to survive.

Microbes help maintain the health of our bodies. For example, they

- make vitamins;
- break down tough plants so we can digest them;
- help to form our immune system and control inflammation.

Exposure to germs in early childhood teaches our immune system how to tell the difference between what is harmful and what is not. Allergies occur when the body sees ordinary, harmless things like pollen as harmful.
Some research even suggests that bacteria may help us maintain a healthy weight and protect us from asthma. When we kill microbes with antibiotics, we kill the good with the bad, which is why we should only take antibiotics when we really need them. And we shouldn't think of all microbes as bad germs that need to be wiped out. Some illnesses are even treated using microbes. Probiotics or microbe-containing yogurt are sometimes used to replace some of our "good" microbes that are destroyed by antibiotics.

How do germs get into our bodies?

Germs are spread in body fluids in the following ways:

1. Direct contact: when body fluids are directly transferred from one person to another. Examples of direct contact are touching and kissing. An animal bite is another example.
2. Droplets: when secretions fly out of kids' (and adults') noses and mouths (when they sneeze, cough, spit, drool, slobber, or vomit) into the air and then land on a hard surface or are inhaled by another person.
    - Droplets can fly only a short distance, usually 3 feet or less, but if they land on another child's eye, nose, or mouth they can spread disease. u Germs can also be spread when children touch droplets that land on a surface like a table and then touch their own eyes, mouth, or nose before washing their hands. u Most of the germs that can be spread by direct contact can also be spread by droplets.
    - Germs that can spread by droplets are more contagious than germs that require direct contact. When an infection can spread between people that are only near each other, the infection is more contagious. Diseases caused by viruses and bacteria can be spread this way.
    - Fungi and parasites are not transmitted by droplets.
    - Germs live longer on stainless steel, plastic, and similar hard surfaces than they do on fabric and other soft surfaces. Germs also live longer when the surface is wet and dirty. Food and water on a surface provide germs with all they need to survive and multiply! When droplets land on a hard surface like a table or a doorknob, the viruses in those droplets can live several hours or more. Bacteria can live for even longer.
3. Airborne transmission: when germs float suspended in the air attached to small droplets or dust particles and travel more than 3 feet.
    - Airborne germs can travel across a room, down a hall, into a ventilation system, to another floor, or even from one building to another where another person can breathe in the germ.
    - Germs that spread by airborne transmission are the most contagious of all. We can inhale them deep into our lungs where they can cause more serious illness. Disinfecting doesn't help with the spread of these kinds of illness.
    - Luckily, not very many germs can travel this way. Those that do are difficult to control. For example, the viruses that cause chicken pox and measles are spread by airborne routes. Nine out of ten unvaccinated people who breathe the air of a person infected with chicken pox or measles will get sick. Cleaning and disinfecting will not prevent air-borne illnesses. This is why vaccination is so important. It is the only way to protect yourself and children from these extremely contagious diseases.

4. Fecal-oral transmission: when germs in stool from one infected person make their way into the mouth of another person. These germs usually cause vomiting and diarrhea.
    - This happens most commonly when infected people don't wash their hands after using the bathroom.
        - When dirty hands touch food, the germs from that person's stool are transferred to the food. When that food is eaten by someone else, the germs enter their body and they can get sick. For example, a toddler touches her dirty diaper, doesn't wash her hands, then takes crackers from a shared bowl, leaving germs on the crackers. Other children who eat crackers from the bowl can get sick.
        - When dirty hands touch surfaces or objects, the germs are transferred there. When another person touches those same surfaces, he gets the germs on his hands. If he eats or puts his hands in his eyes, nose, or mouth without washing them, the germs get into his body and can make him sick.
    - Infections from animals can also be spread this way. For example, reptiles and rodents have caused Salmonella outbreaks in ECE programs. They also carry germs on their skin which can cause illness through direct contact.
    - Some common viruses, including Hepatitis A, Norovirus, and Rotavirus, are spread through fecal-oral routes. They may also be spread by droplets that are produced when a person vomits – this makes them very hard to prevent!
    - Handwashing is our best defense against germs spread by the fecal-oral route!
5. Blood: when an infected person's blood enters another person's body through a break in the skin. Many of the germs that can be found in blood can cause lifethreatening disease. However, most blood-borne infections come from infected needles, not from bleeding knees on the playground.
    - Luckily, infections from blood-borne germs are easily prevented by:
        - teaching children not to touch blood and to tell an adult when there is an injury that involves blood.
        - educating staff about how to handle blood using standard precautions.
    - If children and staff know their jobs when it comes to blood, they can prevent the transmission of infectious diseases through blood in ECE.
6. Insect bites: when an insect transmits bacteria and viruses to humans through their bites. West Nile virus is a disease that is transmitted by mosquitoes, which are insects. Why do some people get sick while others do not?

Whether or not a person is affected by germs depends on several factors:

- How many germs they are exposed to and how powerful (virulent) the germs are. If a person is exposed to many powerful germs, they are more likely to get sick.
- Their general health. If someone is generally healthy and eating and sleeping well, their immune system will function better than the immune system of someone who has other health problems, eats poorly, and doesn't get enough sleep.
- Whether they are immune to the germ. If someone has an illness, they develop antibodies to it. When they are exposed to the germ again, their body's antibodies recognize the microbe and destroy it and they do not get sick. This is how vaccines work, too. Vaccines give your body a small dose of a germ so you can develop antibodies.

Why are ECE programs the perfect environment for the spread of infectious diseases?

- Children in ECE spend their days in groups, which means
  - there is a large pool of germs to share;
  - the transfer of germs from one child to many others is easier and faster because they are in close contact with each other.
- Young children touch each other and hard surfaces more than older children or adults, and then put their fingers in their mouths, eyes, or nose.
- Young children don't yet have good personal hygiene skills.
  - They cough, sneeze, drool and chew on each other and their toys.
  - They are in diapers or the early stages of toilet learning and often have accidents.
    - Touching fecal matter and then the mouth (the fecal-oral route) is a common way to transfer germs that cause gastrointestinal disease.
  - They don't wash their hands unless an adult tells them to or does it for them.

Schools and child care centers have been found to be one of the main causes of the spread of diseases like the flu to the rest of the community.

How are infectious diseases treated?

Viral infections like the common cold or stomach virus infections are not usually treated with medications. Treatment for these infections is supportive care (rest, fluids, and time). Common viral infections cannot be completely prevented. As a result, the average preschool age child gets 8–10 colds a year. Infants and toddlers may get more. Some bacterial infections, like some ear and skin infections, are treated with antibiotics. Some infections can be prevented with vaccines.

We can also reduce the spread of germs by our personal behaviors

- Handwashing with plain (not antibacterial) soap and water is one of the most important ways that we can prevent the spread of germs. Children are not the only ones who spread germs. Teachers and parents also spread germs on their hands.
- Children and staff staying home when they are ill keeps germs at home, too.
- Covering our coughs and sneezing into our sleeves lowers the number of germs that we send out into the environment. Germs get caught in our clothing instead, where they don't live very long!

Read on! This Toolkit will help you better understand all the ways that we can reduce the spread of infectious diseases in ECE.

One last thought on the role of infectious disease in health

While it seems like preventing as much infectious disease as possible in ECE is a good thing, new research shows that many of our chronic health conditions may be caused by growing up in overly clean environments. Science is telling us that exposure to germs and the infectious diseases they cause may contribute to a better functioning immune system. For example, children who grow up on a farm are less likely to have asthma because they are exposed to a wide range of germs when they are young. There has been a sharp rise in allergies, asthma, and asthma-related deaths in developed countries in the last 30 years. Many scientists argue that part of the cause is that the immune system of young children is not stimulated enough by exposure to germs. Research also indicates that exposure to common infections early in life may be protective against childhood leukemia. We still don't know the whole story of how exposure to germs affects our immune system, but there is a connection.

Remember, too, that when young children get sick from exposure to germs in ECE, they will not get as sick when they enter elementary school. This is because they have already developed antibodies to many of the germs they come into contact with in school.

It is important to keep this new science in mind when we weigh the risks of using hazardous chemicals to keep ECE environments as germ-free as possible. Exposure to these chemicals may cause illness, and not getting sick from common infections in childhood may also have risks.

Why is it important to clean in ECE?

Why do we clean? This seems like a silly question, but it is helpful to think about what we accomplish when we clean.

Children are more vulnerable

Care of the physical environment is especially important when caring for young children. They are exposed to more germs and toxic chemicals (for their size) than adults for the following reasons:

- Children breathe 4 to 6 times more air than adults, and they breathe close to the ground where pollutants in air tend to concentrate.
- Children have more skin covering their bodies relative to their weight than adults.
- Children have more skin contact with the floor because of their size and behavior. This means they can absorb more pollutants that concentrate on the floor through their skin.
- Children eat more food per pound of body weight than adults. They are also more vulnerable to food borne illnesses.
- Children's hand to mouth behavior means they eat more dust than adults. Dust contains many toxic chemicals from cleaning products, pesticides, furnishings, and other sources.
- Mouthing objects is more common in young children.

Young children are also still developing and have immature bodies. Their bodies are less able to get rid of toxic substances than adults. Their developing organs, especially their brains, can be affected by exposure to toxic substances. This can affect their growth and their ability to learn and function. So conditions which allow germs, pests, chemicals, dirt, dust, and moisture to build up in the ECE environment can cause more health problems for young children than for the adults who are caring for them.

More reasons to clean in ECE

- Children and staff feel better, both physically and psychologically, when the environment is cared for and clean.
- Research shows that when schools improve their physical environments, children learn better and feel better about themselves and their school. They feel cared for.
- Research shows that teachers are more satisfied with their jobs when the environment is clean and well-maintained.
- Cleaning removes allergens and irritants that can cause or trigger asthma.
- Getting rid of clutter makes it easier to focus on tasks. It also gets rid of hiding places for pests like rodents and cockroaches. This reduces the need for pesticides which may have their own harmful health and environmental effects. It also makes it easier to clean and control dust. Dust contains pollutants that can trigger allergies and asthma, and toxic chemicals that can cause illness.
- The presence of moisture, standing water, and mold can cause respiratory problems and allergies. Keeping the indoor environment clean and dry can reduce mold and respiratory illnesses. It also reduces the use of disinfectants, called fungicides, that are used to get rid of mold after it develops.
- Cleaning, sanitizing, and targeted disinfection where required, can help reduce the spread of infectious disease. Cleaning helps reduce the number of infectious diseases that are passed around in an ECE program by:
    - washing some germs down the drain;
    - removing dirt and organic matter that can reduce the effectiveness of sanitizers and disinfectants.
- Respiratory illnesses such as colds, flu, and asthma are the most common reason children are absent from ECE. When children are absent from ECE, their learning suffers and their parents often miss work. Young children are also affected when their teachers or caregivers are absent due to illness. Preschool is also a critical time for children to form important health and hygiene habits. When you teach children the importance of personal hygiene, and how to keep their environments clean, you help them to establish healthy habits that last a lifetime.

What are the health hazards of cleaners, sanitizers, and disinfectants?

Cleaning, sanitizing, and disinfecting products play an important role in ECE.

However, some cleaning, sanitizing, and disinfecting products also contain chemicals that may cause health problems in children and staff. They may also cause problems in the environment for our waterways and wildlife. Understanding the health risks of these products can help you

- choose them carefully;
- use them more safely and only when and where they are needed.

Many people think that any cleaning, sanitizing, or disinfecting product that is sold must be safe. This is not true.

- American Poison Control Centers report that household cleaning products and disinfectants are common causes of poisoning in both children and adults.
- We don't know much about the long-term health effects of many of these products. These health effects don't show up for months or years. Awareness of the longterm effects is important for young children because they have so many years in which to develop health problems from early exposures. Therefore, it makes sense to limit children's exposure to chemicals when we don't know for certain what effects they may have in the long term.

Government regulations require only limited labeling of cleaning products

Only the active ingredient chemicals in sanitizers, disinfectants, and fungicides that kill bacteria, viruses, or mold have to be listed on the product label. Manufacturers are not required to list all of the ingredients on cleaning product labels. Words such as "natural," "non-toxic," and "green" that appear on cleaning product labels are poorly regulated by the government. While the Federal Trade Commission has guidelines for manufacturers who use these terms, they are rarely enforced. Researchers have found that cleaning products labeled with these terms often have as many hazardous chemicals as conventional cleaning products. These gaps in information on cleaning product labels make it difficult for the consumer to make wise choices when purchasing cleaning products.

More than 85,000 commercial chemicals have been developed in the last 60 years. When health testing is done, it is normally done on a single chemical. However, we are usually exposed to a mixture of chemicals. Scientists do not understand the effects of being exposed to mixtures of chemicals.

Acute and chronic health effects

When we use cleaning, sanitizing, and disinfecting chemicals, we can breathe them into our lungs and absorb them through our skin. When these chemicals affect our health right away it is called an acute effect, such as an asthma attack. But some chemicals get stored in our bodies or we are exposed to small amounts repeatedly over a long time. This chronic exposure can cause cancer or other diseases, such as asthma, years later. These are long-term or chronic health effects. Chemicals also make their way into air and dust and continue to expose children and staff over time. For example, a study of ECE facilities found residues in dust of a dangerous pesticide that had been banned for many years. Dust gets on children's hands and into their bodies.

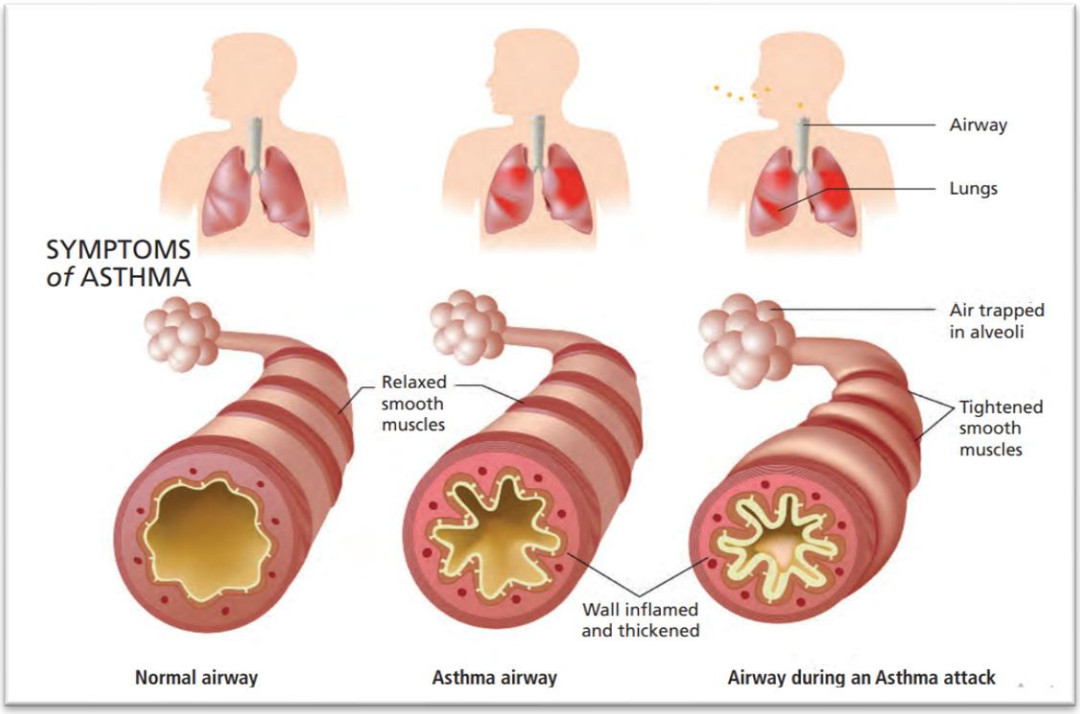
When chemicals are used to clean, sanitize, and disinfect, children and staff can be exposed to health risks because

- the chemicals in the product are hazardous;
- the product is used in a way (such as not following the label directions) that increases exposures to the chemicals.

Potentially harmful exposures from these products also depend on:

- The product's physical characteristics
  - Is it an aerosol (a fine spray that can be breathed deep into the lungs)?
  - Does it evaporate into the air easily where we breathe it?
- The characteristics of the building environment
  - Is the ventilation system the right size and in working order?
  - What is the size of the room?
  - Do the windows and doors open?

What is Asthma?



- Asthma is a chronic inflammatory disorder of the airways in the lungs that results in the following symptoms:
  - Wheezing
  - Coughing
  - chest tightness
  - trouble breathing
- Over 350 substances are known to cause asthma in people who have never had asthma before. Most of them cause asthma through a process called sensitization. Small exposures over time can cause asthma, even to adults.
- Asthma can also be caused by a single high exposure to an irritating chemical. This type of asthma is called Reactive Airways Dysfunction Syndrome (RADS).
- Once a person has asthma, exposure to many "triggers," such as irritating chemicals, animal dander, cold air, tobacco smoke, and exercise can cause an episode of asthma.
- Many cleaning, sanitizing, and disinfecting products contain chemicals that can both cause and trigger asthma.
- Symptoms of asthma can usually be controlled with a variety of drugs, but there is no known cure.
- More people have asthma now than ever before. Almost 19 million Americans, including 7 million children, have asthma. That is nearly 1 in 10 children.
- Children under 5 years old have the most hospitalizations and emergency room visits for asthma.

Some common chemicals and their effects

- Ammonia and bleach (sodium hypochlorite) cause asthma in workers who breathe too much of it in their jobs. They can trigger asthma attacks in children or ECE providers who already have asthma. They can also irritate the skin, eyes, and respiratory tract.
- Quaternary ammonium compounds (also known as QUATs, QACs, or QATs) are not volatile compounds, but using them as sprays can cause nose and throat irritation. Benzalkonium chloride is a severe eye irritant and causes and triggers asthma. Exposures to QUATs may cause allergic skin reactions. Use of QUATs has been associated with the growth of bacteria that are resistant to disinfection. Sometimes this resistance also transfers to antibiotics. In laboratory studies, QUATs were found to damage genetic material (genes).
- Triclosan is a suspected endocrine disruptor (see What are Endocrine Disrupters?) and may lead to the development of antibioticresistant bacteria.
- Phthalates are used in fragrances that are found in air fresheners and cleaning and sanitizing products. They are endocrine disruptors. Research indicates that phthalates increase the risk of allergies and asthma and can affect children's neurodevelopment and thyroid function. Studies show links between phthalates in mothers to abnormal genital development in boys. Phthalates have been found in human urine, blood, semen, amniotic fluid, and breast milk.
- Volatile organic compounds (VOCs) are chemicals that vaporize at room temperature. Many VOCs that are released by cleaning supplies have been linked to chronic respiratory problems such as asthma, allergic reactions, and headaches.

What are Endocrine Distruptors?

Hormones are substances that are produced by our endocrine system.

- In very, very small amounts hormones control growth, reproduction, metabolism, development, behavior, sleep functions, immune function, and stress. These are all functions that are critical for life.
- These functions are controlled by hormonal messages sent by the endocrine system.
- Hormones also play a role in many diseases, including diabetes and cancer.

Endocrine disruptors are chemicals that interrupt or imitate those natural hormonal messages.

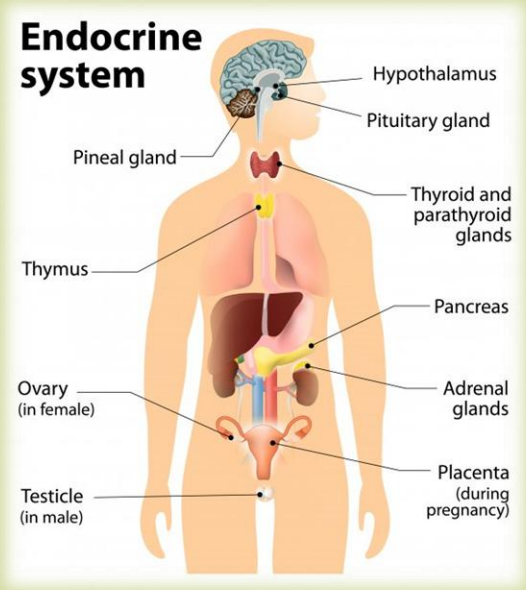
- Since hormones work at very small doses, endocrine disrupting chemicals can also affect health in very small amounts.
- According to the National Institute of Environmental Health Sciences, endocrine disruptors may cause reduced fertility in women and men, early puberty in girls, and increases in cancers of the breast, ovaries, and prostate.
- A 2013 report from the World Health Organization reports that evidence linking hormone-mimicking chemicals to human health problems has grown stronger over the past decade, becoming a "global threat" that should be addressed. 14 Phthalates are endocrine disruptors. They are used in fragrances that are found in air fresheners and cleaning and sanitizing products.

Phthalates are endocrine disruptors. They are used in fragrances that are found in air fresheners and cleaning and sanitizing products.

- Fragrances are mixtures of many chemicals, including VOCs. They can contain up to 3,000 separate ingredients. There is no requirement that fragrance ingredients be listed on the product label. Many of these chemicals:
  - can trigger asthma and allergies;
  - may be hazardous to humans. (See Section 8 for more information on fragrances.)
- Terpenes are chemicals found in pine, lemon, and orange oils that are used in many cleaning and disinfecting products as well as in fragrances. Terpenes react with ozone, especially on hot smoggy days, forming
  - very small particles like those found in smog and haze that can irritate the lungs and may cause other health problems
  - formaldehyde which
    - causes cancer,
    - is a sensitizer that is linked to asthma and allergic reactions,
    - has damaged genes in lab tests,
    - is a central nervous system depressant (slows down brain activity),
    - may cause joint pain, depression, headaches, chest pains, ear infections, chronic fatigue, dizziness, and loss of sleep.

The Endocrine System

- Hypothalamus - Regulates hunger, thirst, sleep, and wakefulness, plus most of your involuntary mechanisms including body temperature.
- Pituitary gland - Controls all other endocrine glands, influences growth, metabolism,* and regeneration.
- Thyroid glands - Regulate your energy and your metabolism.
- Parathyroid - Secretes the hormones necessary for calcium absorption.
- Thymus - Helps build resistance to disease.
- Pancreas - Aids in the digestion of protein, fats, and carbohydrates. Produces insulin which controls blood sugar levels.
- Adrenal glands - Secrete hundreds of compounds including cortisone and adrenaline, which helps you react to emergencies. Regulates your metabolic processes in the cells, water balance, blood pressure, etc.
- Ovaries, Testes - Influence how your blood circulates and determines your mental vigor and your sex drive.



The conversion of nutients into energy and building materials to meet your body's needs.

Improper use of cleaning, sanitizing, and disinfecting chemicals can increase exposure and health risks

Each year about 6 out of every 100 professional custodians are injured by the chemicals they use to clean, sanitize, and disinfect. Burns to the eyes and skin are the most common injuries, followed closely by breathing toxic mists or vapors.

Many of these injuries are due to improper use of cleaning, sanitizing, and disinfecting products. For example, many chemicals used for cleaning, sanitizing, and disinfecting come in a concentrated form. To be used, they have to be correctly diluted with water:

- When diluting concentrated products unsafely, the user increases her exposure to the health hazards of the product. She is exposed by breathing the fumes of the concentrated product into her lungs or absorbing the liquid through her skin.
- If the wrong chemicals are mixed together, they can react to form a toxic gas and the health effects can be much worse. For example, when bleach is mixed with ammonia or quaternary ammonium compounds (found in some disinfectants), chloramine gas is created, which is highly toxic.
- If a chemical is too concentrated (the user doesn't add the amount of water indicated on the product label), then the health effects of using that product are increased. They are increased for the person who is using the product. They are also increased for the people who occupy the indoor space where it is used, especially children.
- It is important to follow dilution instructions carefully to avoid harm to the person doing the diluting, as well as to the children and staff in the building. Personal protective equipment such as gloves and goggles, when indicated on the product label, should be worn while working with concentrated chemicals. Better yet, avoid using products that require personal protective equipment!

Aerosols

Use of spray bottles, aerosol cans, and machines such as carpet washers create a fine mist (aerosolization) of the cleaning product, increasing the amount of chemical suspended in the air. These suspended chemicals cause problems with breathing such as asthma. The small particles created by aerosolization can get deeper into the lung. These products should never be used around children.

Using cleaning, sanitizing, and disinfection products without good ventilation When an ECE building does not have a good ventilation system, or doors and windows are not opened while cleaning, the concentration of chemicals in indoor air increases; so do the health effects of those chemicals. It is important to make sure that your ventilation system is working properly in order to reduce the concentration of chemicals in indoor air from cleaners, sanitizers, and disinfectants and other sources. (For more information, see Fact Sheet: What is Indoor Air Quality?)

How do we prevent these health hazards?

Choosing less hazardous cleaning, sanitizing, and disinfecting products can reduce harmful health effects for children, ECE staff, and custodial workers. It is also better for the environment.

There are also many non-chemical strategies for cleaning, sanitizing, and disinfecting that are less harmful to the user and to ECE staff and children. See Section 6 to learn about these alternative "best practices" and Section 7 for information on how to purchase safer products.

Effects of cleaning, sanitizing, and disinfecting products on the environment

Cleaning, sanitizing, and disinfecting in ECE reduces the risk of infectious disease and removes allergens and irritants that cause or trigger asthma and allergies. But many cleaners, sanitizers, disinfectants, and fragrances, even those marketed as "green", can pollute the air, water, and soil.

These products are washed down the drains of our child care facilities, schools, homes, and workplaces. They make their way in wastewater to the treatment plant where waste water is treated. During the treatment, sewage is separated into treated wastewater and sludge. Treated water is then discharged into our ground water, rivers, lakes, and oceans. Many of these waterways supply drinking water to our communities. The problem is that wastewater treatment plants were not designed to remove these chemicals. It is important to think twice before washing or flushing anything down the drain that can harm the environment. Choosing the products you use in your indoor environments carefully can help protect the environment as well as your health. Below we describe two examples of products that are harmful to the environment.

Triclosan in the environment

Triclosan and its relative triclocarban are antimicrobial chemicals that slow or stop the growth of bacteria, fungi, and mildew. They are found in antibacterial soaps, deodorants, sponges, and household cleaners and disinfectants. Over 1 million pounds of triclosan and triclocarban are disposed of in the environment every year.

The transport of triclosan to wastewater treatment plants occurs when people

- wash hands with antibacterial soap;
- hand-wash dishes with antibacterial dish soap;
- use personal care products such as toothpaste that contain triclosan;
- use products like cutting boards that contain triclosan.

As a result, triclosan ends up in our drains, sewage systems, and eventually our waterways. It also gets concentrated in the sludge created in wastewater treatment plants. Over 400,000 pounds of triclosan and triclocarban are spread on agricultural fields in the U.S. every year when this waste treatment sludge is recycled as "fertilizer." Scientists are concerned that plants that grow in the soil contaminated with triclosan from sludge will absorb the triclosan. In experiments, researchers have found triclosan in carrots, pumpkins, and zucchini – foods that are normally good for children. Triclosan is also found in lakes, rivers, ocean coastal waters, domestic and drinking water, soils,

indoor dust, fish and other aquatic animals, and humans. Eating fish and fruits and vegetables that contain triclosan is another way humans may be exposed. Research shows triclosan is present in human urine, blood, and breast milk.

Sometimes the risks of using a chemical are balanced by the benefits. But the Food and Drug Administration (FDA) says that triclosan is no more effective at killing germs than washing well with soap and water. According to the Centers for Disease Control and Prevention (CDC), vigorous handwashing in warm water with plain soap for at least 20 seconds is sufficient to fight germs in most cases. When soap and water are not available, use of an alcohol-based hand sanitizer product is a better option than soap that contains triclosan.

Many authorities, including the American Medical Association (AMA), now recommend that triclosan should not be used in consumer products. The health and environmental risks of triclosan are not worth the very limited benefits.

Fragrances in the environment

Fragrances are chemicals that are in most cleaning, sanitizing, and disinfecting products. They

- react with sunlight to contribute to smog formation in indoor and outdoor air;
- may affect water quality when they are used in liquid products like cleaning and personal care products.

Like triclosan, many fragrance chemicals are not filtered out by water treatment. What goes down the drain ends up in our drinking water and in our lakes, streams, rivers, and bays. These compounds

- break down slowly in the environment;
- are found in the water supply, leading to high levels in nearly all fish, shellfish, and other aquatic wildlife;
- are concentrated in larger animals when larger fish and other wildlife eat contaminated aquatic wildlife. From there, these pollutants travel up the food chain to human beings.

What is the difference between cleaning, sanitizing, and disinfecting and how do these tasks help control infectious disease in ECE?

Before choosing a cleaning or antimicrobial product, you will first need to decide whether the surface needs to be cleaned, sanitized, or disinfected. In most cases, you will need to clean a surface before you sanitize or disinfect. But it doesn't make sense to disinfect something that only needs to be cleaned. The products used to disinfect are more toxic and/or more expensive than products used just to clean. Overusing antimicrobial products like sanitizers and disinfectants may

also lead to the spread of "superbugs." Superbugs are germs that are not easily killed by disinfectants and/or antibiotics.

The CDC provides the following guidance on the differences between cleaning, sanitizing, and disinfecting.

Cleaning

- Reduces germs, dirt, and impurities by removing them from surfaces or objects. Dirt and organic material make some disinfectants less effective, so cleaning is necessary before disinfecting in most cases.
- Works by using soap or detergent and water to physically remove germs from surfaces. This process does not necessarily kill germs.
- Lowers the risk of spreading infection by washing germs down the drain.
- Has been shown to remove up to 98% of bacteria and 93% of viruses from surfaces using microfiber and water in tests published by the EPA.
- Removes the food and water that allow germs to survive and reproduce.
- Removes dust, molds, irritants, and allergens that can trigger asthma symptoms.

Sanitizing

Sanitizing is the use of a chemical product or device (like a dishwasher or a steam mop) that reduces the number of germs on surfaces or objects to a level considered safe by public health standards or requirements. Sanitizing kills most germs but not all of them.

- For food service, a sanitizer should reduce the number of germs on a surface by 99.999% within 30 seconds.
- For hard surfaces not used for food service the level should be at least 99.9%.
- Sanitizing products should state on their label the surfaces they are intended to be used on.
- Sanitizing does not necessarily clean dirty surfaces or remove germs. Most sanitizers, as well as disinfectants, require a clean surface in order to be effective at killing germs.

Sanitizing in child care is required for specific areas, such as food preparation and contact surfaces, and mouthed toys and pacifiers. For guidelines on when and where to clean, sanitize, and disinfect.

Disinfecting

Disinfecting uses chemicals to kill 99.999% of germs on hard, non-porous surfaces or objects. Disinfecting

- does not necessarily clean dirty surfaces or remove germs;
- kills germs on contact (when the disinfectant sits visibly wet, or “dwells,” on the surface for a specified length of time) after the surface has been cleaned;

- only works on hard, nonporous surfaces. Carpets and upholstery and other porous surfaces cannot be sanitized or disinfected with a chemical product;
- is temporary! As soon as a surface has been touched or coughed, sneezed or breathed on, germs start growing on it again.

Some germs are very hard to kill, while others are easily killed by many disinfectants, and even plain soap.

Disinfectants are antimicrobial pesticides and must be registered with the U.S. EPA and the California Department of Pesticide Regulation (DPR) or similar agencies in other states.

Some devices can be used to disinfect; for example machines that apply steam to surfaces. These devices are very effective, work quickly, and use no chemicals. Some are mops and others look like a canister vacuum with attachments for use on different surfaces. They can also disinfect surfaces that chemical disinfectants cannot, such as upholstery and carpets. Dust mites that live in these surfaces are also eliminated by these devices.

Because disinfectants are pesticides designed to kill or inactivate germs, you should make sure you need them for the specific task. The overuse and misuse of these products is a growing public health and environmental concern. Studies have found that the use of some disinfectant products is creating microbes that can mutate into forms that are resistant to particular disinfectants or that become superbugs. These resistant germs are also harder to kill with antibiotics.

Incorrectly using a disinfectant may kill the weaker germs, but the more resistant germs survive. Incorrect use includes

- disinfecting a dirty surface;
- wiping or rinsing the disinfectant off the surface before the recommended dwell (contact) time is over;
- not using the recommended dilution ratio (not concentrated enough);
- using a combination disinfectant/cleaner without first removing visible dirt from the surface.

When deciding on what products to use on a surface, there are several factors to consider:

1. Whether the surface is porous or nonporous.
    - Manufacturers design their antimicrobial products – and the U.S. Environmental Protection Agency (EPA) registers them – on the basis of the surfaces they are meant to be used on and what the surfaces are used for (for example, food preparation).
    - Different types of surfaces require different types of products and methods for removing or killing germs.
2. Whether it is likely that the surface is touched by many people and will come in contact with broken skin or mucous membranes. These surfaces will require disinfection. If a surface is contaminated with germs but no one is touching it, it doesn't need to be disinfected. It is best to avoid unnecessary use of chemicals in that area.
3. Whether the surface requires
    - sanitizing which removes most germs to the level of 99.9% or more on non-food contact surfaces;

- disinfecting (to kill virtually everything).

Remember, some infectious diseases are spread in the air. Disinfecting surfaces will not prevent the spread of these diseases! The only way to prevent the spread of airborne diseases is by our behaviors. See Section 6 on non-chemical strategies for reducing the spread of infectious disease.

What are the recommendations and requirements for sanitizing and disinfecting?

There are typically two levels of sanitizing and disinfecting in an ECE facility:

1. Routine sanitizing and disinfecting: This level is used for those areas that need sanitizing and disinfecting on a regular basis (after proper cleaning with a highquality microfiber cloth and an all-purpose detergent).
   Areas requiring routine sanitizing:
   - Food contact surfaces (surfaces where food is served, stored, or prepared)

   Areas needing routine disinfection:

   - Surfaces and items that are regulated by state child care licensing requirements, such as changing tables and bathroom sinks and toilets.
   - High-touch areas that are at high risk for collecting lots of germs, like doorknobs, bathroom faucets, and drinking fountains.

The national quality standards for health and safety in child care are contained in the book Caring for Our Children (CFOC), by the American Academy of Pediatrics, the American Public Health Association, and the National Resource Center for Health and Safety in Child Care and Early Education. It is available online at http://nrckids.org/CFOC3/ and includes a table of recommendations for which areas in ECE facilities require cleaning, sanitizing, or disinfection and how often. See Appendix D: Model Center Policy on What, Where and how often to Clean, Sanitize, and Disinfect in ECE on page 58 for a copy of these recommendations.

Routine sanitizing and disinfection are also required by state child care regulations. For example, in California, the most populous state, the California Child Care Licensing regulations mandate sanitizing and disinfecting in child care facilities to reduce the risk of infectious diseases. For information on regulations in other states, see http://nrckids.org/STATES/states.htm. The chart below provides the sanitizing and disinfecting requirements for California child care centers' infant and toddler classrooms, as well as recommendations from Caring for Our Children (CFOC). For the complete list of CFOC recommendations, see Appendix D: Model Center Policy on What, Where and how often to Clean, Sanitize, and Disinfect in ECE.

Sanitizing and disinfecting requirements and recommendations comparison chart

Surface	CA Child Care Licensing Required	Frequency	Caring for Our Children Recommendation	Frequency
Infant/Toddler Classrooms				
Diaper changing areas	Disinfect	After each use	Disinfect	After each use
Potty training chairs	Disinfect	After each use	Disinfect	After each use
Disposable diaper container	Sanitize	Daily	Sanitize	Daily
Napping Equipment				
General	Disinfect	Weekly, or if soiled or wet	Clean	Weekly, monthly, or before use by another child
Infants	Disinfect	Daily, or if soiled or wet	Clean	Weekly, monthly, or before use by another child
All Classrooms				
Dishes, utensils, cups	Sanitize	After each use	Sanitize	After each use

2. Disinfection for incidents and outbreaks. In addition to routine sanitizing and disinfecting the following incidents and outbreaks require increased sanitizing and disinfecting:
    - Outbreaks of contagious disease, such as Methicillin-resistant Staphylococcus aureus (MRSA), influenza, and other infectious diseases. For outbreaks, increased disinfection of high-touch areas is appropriate. For guidance on specific disease outbreaks, go to the CDC website. Information on reducing the spread of flu in ECE can be found at http://www.cdc.gov/flu/school/index.htm.
    - Incidents involving blood and body fluids, such as fights, nosebleeds, and accidents on the playground. See Section 11 for information on cleaning up body fluids spills.
    - Incidents involving feces, vomit, and saliva, such as in toileting areas in preschool.

For areas not mentioned in the Caring for Our Children recommendations or your state regulations, consider whether the area is a hightouch area. Is it a surface touched by many children and caregivers during the day? If so, it is a surface that needs to be cleaned and may need to be sanitized or disinfected, especially when there is an outbreak of infectious disease in the facility.

Identify high-touch surfaces in your facility. They will require more frequent cleaning and sometimes disinfecting during a disease outbreak.

It is important to know the differences between cleaning, sanitizing, and disinfecting and what surfaces require what degree of cleanliness, because you only want to use the least hazardous products and methods that are necessary for the task.

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Personal practices for reducing the spread of infectious disease in ECE

Although microbes are everywhere, most are harmless and many are helpful. Only 1% of microbes cause disease. The goal of an infectioncontrol program is to reduce the spread of infectious disease by reducing contact with pathogenic (disease-causing) germs or microbes. This curriculum provides guidelines on choosing safer chemical products to clean, sanitize, and disinfect, but it is very important to remember that some of the most effective ways of reducing the spread of infectious disease are found in our personal behaviors.

Disinfection should be called "temporary disinfection" because germs start to grow on disinfected and sanitized surfaces as soon as you touch them again. By washing your hands frequently, you reduce the number of germs that you pick up from and leave on the surfaces and people that you touch. You are also less likely to transfer those germs to your nose, eyes, and mouth, where they can get into your body and cause infection and illness.

According to the CDC, handwashing is the single most important thing you can do to reduce the spread of infectious disease in ECE as well as at home. If you focus on disinfecting but you don't wash your hands and practice good personal hygiene, you will continue to spread disease. You need to take personal responsibility for protecting the young children in your care from infectious disease. Research has shown that caregiver hands in ECE harbor more germs than almost any other surface. Caregivers change diapers, assist children with toileting, wipe noses, hold hands, handle mouthed toys, and more. Frequent handwashing is the only way to stop the circle of infection caused by caregivers' hands.

ECE providers need to be involved in efforts to improve handwashing in ECE. By making hand washing a responsibility of staff as a whole, hospitals have found improvements in hand washing rates. When ECE staff members implement handwashing, and other behavioral strategies described below for themselves as well as for the children in their care, infectious disease risk will be reduced. Handwashing also prevents the transfer of toxic chemicals from children's hands to their mouths. Studies show that children swallow more chemicals from the skin on their hands than from mouthing toxic products directly. Hand sanitizers only kill bacteria. They do not remove toxic chemicals

One of the most important lessons you can teach children in ECE is personal hygiene. This includes handwashing, blowing noses or sneezing into a tissue, and/or coughing or sneezing into our elbow. Making these behaviors automatic for a preschool child sets the stage for the child's lifelong use of healthy habits. Preschool children are eager to master routines and skills. An ECE program is an ideal place to begin shaping children's health habits, routines, and practices. For many children, it is the only place where they will learn these skills. Incorporating these habits into the curriculum and daily routine of the program helps to prevent the spread of infectious disease.

Behavioral strategies that can reduce the spread of infectious disease

1. Cough and sneeze etiquette
    - Cover your nose and mouth with a tissue when you cough or sneeze. Throw the tissue away after use and wash your hands with soap and water. If soap and water are not available, use an alcohol-based hand sanitizer. If a tissue is not available, cover your mouth and nose with your sleeve, not your hand.
    - Avoid touching your eyes, nose, or mouth. The skin that lines your eyes, nose, and mouth is called your mucous membranes. Germs can make their way into the body through mucous membranes, so keeping your hands away from your face keeps germs from entering your mucous membranes and helps to keep you from getting sick.
2. Isolation/social distancing
    - Stay home if you are sick. Don't risk passing your germs on to others at your program. Go to the CDC website http://www.cdc.gov/outbreaks/index.html for the latest information when there is an infectious disease outbreak. They will provide information on how to deal with special disease outbreaks like H1N1, including how long you should stay home before returning to work.
    - Encourage children and staff who are coughing or sneezing to leave a 3-6 foot buffer between themselves and others.
3. Vaccinations

    Next to hand washing, vaccinations are the best way to protect against infectious disease, according to the CDC. States require certain immunizations for infectious disease before children can attend ECE. Each center should know what immunizations are required in their state.

    The publication Caring for Our Children: National Health and Safety Performance Standards recommends (and child care licensing regulations in most states require) that child care facilities maintain documentation of the immunizations the children in attendance have received. Immunizations are particularly important for children in ECE programs because they are at higher risk of complications from infectious disease due to their immature immune systems. Vaccinations are also recommended for caregivers, teachers, and other staff members. Check your state's child care guidelines for required and recommended vaccinations. For recommendations on adult vaccinations, see the CDC website at http://www.cdc.gov/vaccines/schedules/easy-toread/adult.html

    The CDC suggests that everyone 6 months and older should get an annual flu vaccine. Remember, it takes about 2 weeks after vaccination for your body to develop an immune response.
4. Equipment

    Certain pieces of equipment can aid in reducing the transmission of infectious disease by reducing the number of high touch areas where microbes may be spread or by increasing air flow from the ventilation system in an ECE facility.
    - No-touch bathroom facilities are available as self-flushing toilets and faucets that turn on and off automatically. Automatic flushers can be added to most existing toilets. Handsfree faucets that use a sensor to turn the water on and off are also available at most home improvement stores.

- Disposal equipment such as diaper pails and garbage cans should have a tightfitting lid that can be opened with a foot pedal so that ECE staff are not touching places where microbes might live and multiply.
- Separate equipment for food preparation, diaper-changing, and toddler handwashing. Keeping these activities physically separate helps reduce the risk of spreading germs from one activity to another.
- Impermeable, seamless surfaces for use in food preparation, diaper-changing, and handwashing. Surfaces that are porous, cracked, or damaged increase the likelihood that germs will escape disinfection and allow transmission, especially when people touch these surfaces frequently.

5. Ventilation

Ventilation is the exchange of fresh air within a building. Increasing the amount of fresh air within a building and removing indoor air containing germs that are spread through the air can also reduce the risk of infectious disease.

- Mechanical ventilation is usually known as a central heating, ventilating, and airconditioning (HVAC) system. If you have an HVAC system in your facility, make sure it is inspected and serviced on a yearly basis and that the air filters are changed regularly.
- Passive ventilation is the air that comes in from opening and closing doors or windows. This source of air is also affected by the wind and conditions outside. You can increase the amount of air brought in and removed from a room by putting an exhaust fan in a window on one side of a room or building, and opening a window on the opposite side to pull in air, move it across the space, and exhaust (remove) it to the outside. Make sure you are not bringing in air from an area where vehicles are idling.

6. Air filtering and cleaning equipment

This equipment can filter or kill germs and filter pollutants from cleaning and disinfectant products out of the air. Some air cleaning devices are designed to be installed in the ductwork of an HVAC system to clean the air in the whole building. You can also buy portable room air cleaners to clean the air in a single room or specific areas. There are several processes available:

- Air filtering. To filter out germs such as viruses, which are very tiny, requires a filter that has a high-efficiency particulate air (HEPA) rating. These should be properly sized for the room.
- Air cleaning. Some equipment will kill germs, but is not appropriate for use in a child care setting (such as ultraviolet light) or are not safe (such as devices that clean air but also create ozone, a pollutant). Purchase an air cleaner on the California Environmental Protection Agency Air Resources Board list of certified air cleaning devices available at http://www.arb.ca.gov/research/indoor/aircleaners/ certified.htm or the EPA Guide to Air Cleaners in the Home available at: http://www.epa.gov/iaq/pubs/airclean.html .

Hand sanitizers
Many people use hand sanitizers instead of soap and water when washing their hands. Hands should always be washed with soap and water when possible because sanitizers don't remove dirt, and germs can hide under the dirt and remain on the hands. When you can't wash your hands, the CDC recommends using an alcohol-based hand sanitizer containing more than 60% alcohol. Children are at greater risk of harm from hand sanitizers because they can lick the residue off their hands and ingest the ingredients in the sanitizer.

Choosing safer products for cleaning, sanitizing, and disinfecting

Using the least hazardous and most effective products available will protect the health of the children in your care, ECE staff, the custodial personnel, and other building occupants. Using these products is also better for the environment.

Third-party certifiers: A way to identify safer cleaning products

Organizations that evaluate products using science-based criteria for health and environmental impacts are called third-party certifiers. They help us identify less hazardous cleaning products and publish lists of the products they have evaluated and certified. They have developed standards that they use to review products. These standards prohibit or limit chemicals that can cause the following:

- cancer and reproductive harm
- asthma
- corrosive damage to the skin and eyes
- toxicity to fish and other aquatic animals
- indoor air pollution and other environmental and health problems

The 3 main certification agencies

EcoLogo is a program of Underwriters Laboratory based in Canada. Some of these products are available in the U.S. and some are not. A list of certified cleaning products is available at http://www.ecologo.org/en/certifiedgreenproducts/category.asp?category_id=21&cat=1 .

Green Seal is a program based in the U.S. and used by many institutional purchasers. A list of Certified Cleaning Products is available at http://www.greenseal.org/FindGreenSealProductsandServices.aspx?vid=ViewProductDetail&cid=19&sid=23 .

Design for the Environment (DfE) is a U.S. EPA program. DfE certifies both institutional and retail/consumer products. A list of DfE-certified cleaning and other products are available at www.epa.gov/dfe/products

Look for these seals or logos

The logo or seal for third-party certified products is on the product container.

If a product does not carry a third-party certification logo, look for the following:

- Ingredients listed on the label
- No signal word "Danger" on the label. "Signal words" on the label are used to indicate the product's relative level of severity of hazard and alert the reader to a potential hazard.
- Non-aerosol
- No overwhelming chemical odor
- Fragrance-free
- Dye-free

To make choosing products easier, go to the Transpare website where you can use their search application to find and compare safer institutional cleaning products. www.transpare.com .

Ingredients to avoid

If you can't find third-party certified products, avoid the ingredients on this list. They can be harmful to our health or the environment.

- 2-butoxyethanol (or ethylene glycol monobutyl ether) and other glycol ethers
- Alkylphenol ethoxylates (some common ones: nonylphenol and octylphenol ethoxylates, octoxynols)
- Bisphenol A
- d-Limonene
- Dyes (may be listed as FD&C or D&C)
- Ethanolamines (common ones to look out for: monoethanolamine [MEA], diethanolamine [DEA], triethanolamine [TEA])
- Fragrances
- Parabens

- Phthalates
- Pine or citrus oil
- Quaternary ammonium compounds. Look out for these:
  - alkyl dimethyl benzyl ammonium chloride (ADBAC), benzalkonium chloride, dodecyl-dimethyl-benzyl ammonium chloride
  - lauryl dimethyl benzyl ammonium chloride
  - benzyl-C10-16-alkyldimethyl, chlorides
  - benzyl-C12-16-alkyldimethyl, chlorides
  - benzyl-C12-18-alkyldimethyl, chlorides
  - benzyl-C16-18-alkyldimethyl, chloride
  - didecyl and didecyl dimethyl benzyl ammonium chloride
  - Triclocarban
  - Triclosan

Choosing safer cleaning products

An ECE facility can be cleaned using just a few products. There are two types of products available for cleaning a public space:

Institutional products

- These are purchased from a cleaning products distributor.
- They are often not available in retail stores in the community. For example, until recently, some of the newer and less hazardous accelerated hydrogen peroxidebased products have been available only through distributors.
- They are available as a concentrate that can be diluted with water for different cleaning tasks. Distributors will provide the dilution stations and labeled bottles that meet Occupational Safety and Health Administration (OSHA) requirements for hazard communication for the diluted products. It's important when using a concentrate to dilute the product as recommended on the label.
- They come accompanied by Safety Data Sheets (SDSs) that you must have on site to satisfy OSHA rules.
- Institutional products are generally less expensive than similar products available in retail stores.

Most distributors carry products certified as safer by a third-party (Green Seal, EcoLogo, Design for the Environment). For more information on how to set up group purchasing through a distributor, see Appendix B: Tips on Forming a Buying Cooperative on page 56.

Retail products

- These are purchased at a retail store like a grocery store.
- They come available in ready-to-use containers or as concentrates such as bleach.
- Concentrated products do not come with dilution equipment, increasing health hazards for the user.

- Some are certified as safer by a third-party (Green Seal, EcoLogo, Design for the Environment).
- Safety data sheets must be downloaded from the internet or you may have to contact the manufacturer for a copy.

Choosing safer sanitizers

Caring for Our Children: National Health and Safety Performance Standards recommends sanitizing for toys, thermometers, pacifiers, teething toys, eating utensils, tables and high chair trays, food preparation areas, mixed use tables, and computer keyboards. (See Appendix D: Model Center Policy on When and Where to Clean, Sanitize, and Disinfect in ECE.)

When choosing a sanitizer, look for the following:

- A 0 rating on the Hazardous Materials Identification System (HMIS) health rating scale
- The signal word "Caution" (rather than "Danger" or "Warning") on the product label
- EPA registration number (verifies that the product is registered by the EPA to kill the germs claimed on the label)
- Approval for food contact surfaces
- Short dwell time (the time the sanitizer must be left visibly wet on the surface and in contact with the germs to kill them). For example, 10 minutes would be considered a very long dwell time and would most likely require re-wetting for proper compliance with the label.

Choosing safer disinfectants

There are many different types of disinfectants available. When selecting and using disinfectants, always check for the following:

- Does the product have an EPA Registration Number? All disinfectants are required to have an EPA Registration number.
- Is it approved for the task and surface you will use it on?
- Will it damage the surfaces cleaned with it?
- What germs does it kill?
    - Not all disinfectants kill all germs.
    - A "hospital grade" disinfectant sounds like it kills all sorts of germs, but it is only required to kill two target organisms: Staphylococcus aureus and Pseudomonas aeruginosa. Many identify other germs that they kill as well, but you have to check the label.
    - Many infectious diseases found in ECE are caused by viruses. Make sure you choose a product that is effective against viruses.
- What is the dilution ratio of the product? (How do I mix it correctly?)
- Is it a "one-step" disinfectant-cleaner or a disinfectant that requires you to clean the surface first? (Even when using one-step products you have to pre-clean heavily soiled areas.)

Bleach
Sodium hypochlorite, or bleach, has long been used in ECE to sanitize and disinfect. Recently, bleach has been declared an asthmagen by the Association of Occupational and Environmental Clinics. An asthmagen is something that can cause asthma. Recent changes in the concentration of EPA-registered bleach products also make correct dilution more confusing and difficult. There are safer products available. For this reason, we are not recommending the use of bleach in ECE to sanitize and disinfect. For more information, see Fact Sheet: What's the Problem with Bleach?

The EPA's Design for the Environment Antimicrobial Pesticide Pilot Project is the only program that can legally certify disinfecting products that are less hazardous for human health and the environment in the U.S. If you see the DfE logo on an EPA-registered antimicrobial pesticide (disinfectant) label, you can be assured that the product

- is in the least-hazardous classes (i.e. III and IV) of EPA's acute toxicity category hierarchy;
- is unlikely to have carcinogenic or endocrine disruptor properties;
- is unlikely to cause developmental, reproductive, mutagenic, or neurotoxic effects;
- has been shown to be effective against the microbes listed on the label (associated with the Antimicrobial Testing Program or otherwise).

For more information on the Design for the Environment Pilot Project, go to: http://www.epa.gov/pesticides/regulating/labels/design-dfe-pilot.html#means

Group buying

Buying institutional cleaners or disinfectants and sanitizers from a cleaning products distributor in volume can help save money. If you belong to a group with other ECE programs, or to a group representing ECE programs, you can buy your cleaning products together from an institutional distributor. (See Appendix B: Tips on Forming a Buying Cooperative on page 56).

You should request bids from several distributors to compare prices for the following third-party certified products:

- One concentrate that is diluted for the following tasks:
  - Bathroom/restroom cleaner
  - All-purpose cleaner
  - Carpet spotter/extraction cleaner
  - Glass and window cleaner
  - Neutral floor cleaner
- Heavy-duty cleaning product
- Hand soaps (with no antibacterial properties) and hand sanitizers

  - Foaming hand soap is a form of liquid soap that has been whipped with air to create a foam of soap bubbles. This style of soap requires special dispensers, but it is easier to apply and lather, and results in less soap and water use. The dispensers are also less likely to clog and drip.
- Environmentally preferable and safer disinfectants and sanitizers. If possible choose a product that has been certified by the Design for the Environment Disinfectant Pilot Program. For a list, visit http://www.epa.gov/pesticides/regulating/labels/design-dfepilot.html#means
  - A 0-1 rating on the Hazardous Materials Identification System (HMIS) health scale (See Section 10 for more information).
- Floor and carpet care products that are effective, safer alternatives to the many highly hazardous products on the market
  - Wax stripper
  - Floor sealer and finish
  - Carpet cleaner
- Mineral build-up remover (used on toilets; typically a highly hazardous product for which there are effective, less hazardous alternatives)

Safety Data Sheets

Material Safety Data Sheets are now called Safety Data Sheets (SDSs) under new OSHA requirements. See Section10: What is a Hazard Commununication Program for more information on how to read a SDS.

Clean isn't a smell!

Scented products are everywhere in our daily lives. Fragrance is added to personal care and household products and many other items that we use each day. Most products used to clean, sanitize, and disinfect contain fragrances. Air fresheners are often used in ECE by staff members who want to make indoor areas smell better, especially when diapers are being changed frequently. But fragrances do not clean the air. They disguise the smells by adding more chemicals to the air.

Manufacturers of cleaning products use fragrances for many reasons besides making the product smell nice. Fragrances are used to

- make you associate a particular smell with use of their product;
- hide or mask unpleasant odors that come from chemicals in the product;
- signal to you that the product has worked and the area where it has been used is clean.

It is a common mistake to think that if a cleaning product doesn't leave a scent after use, the product didn't work and the area is not clean. For example, when you smell a citrus fragrance after

cleaning it does not mean the product is safer, more "natural," or does its job. Cleaning, sanitizing, and disinfecting products all contain chemicals. Products that have a fragrance contain additional chemicals that may pose health risks and are unnecessary. Even "unscented" or "fragrance-free" products may contain chemicals which are added to mask the smell of the chemicals. Nevertheless, it is better to buy a product marked fragrance-free than one that contains fragrance when possible. Fragrances enter the body in many ways. They are

- absorbed through the skin;
- inhaled into the lungs;
- swallowed, especially by children with hand-to-mouth behaviors.

Health effects of fragrance chemicals in air fresheners and "fragranced" cleaners, sanitizers, and disinfectants

- Fragrances can irritate the lungs and trigger asthma, headaches, and allergic contact dermatitis (skin reactions).
- Higher levels of some fragrance chemicals have been linked to reproductive problems in women.
- Some fragrance chemicals have been linked to certain types of cancer.

Phthalates are chemicals used as solvents and carriers for fragrances. Phthalates can accumulate in the human body. They are excreted in breast milk, exposing nursing infants who are especially vulnerable to the health effects of chemicals because their bodies are developing rapidly. Phthalates are endocrine disruptors. They have been linked to

- an increase in prostate and breast cancer;
- adverse reproductive system outcomes, including reduced semen quality and altered male genital development;
- neurodevelopment problems, such as attention disorders, in children who are exposed prenatally.

Air fresheners

Air fresheners are particularly concentrated sources of fragrances that are full of toxic chemicals.

- The hazards of air fresheners are hidden. Like cleaning products, potentially hazardous chemicals contained in fragrances are not required to be listed on the label.
- Some chemicals in air fresheners are sensitizers that can lead to allergies. They can also trigger asthma, allergic reactions, wheezing, headaches, and contact dermatitis.
- Some chemicals in fragrances are endocrine disruptors, mimicking or disrupting the body's own hormones.
- Common air freshener chemicals, such as limonene, can also react with other chemicals, particularly ozone. This results in the creation of additional hazardous pollutants such as

- formaldehyde, which is linked with cancer and can cause asthma, and acetaldehyde, which is also linked with cancer;
- ultrafine particles that can be inhaled deep into the lung. They are linked with heart and lung disease.

The use of a single air freshener can also violate the Americans with Disabilities Act, because people who experience disabling health effects from air fresheners cannot access the public facility. In two national studies, approximately 20% of the U.S. population and 40% of persons with asthma, reported headaches, breathing difficulties, or other health problems when exposed to air fresheners or deodorizers.

Are "natural" air fresheners any safer?

- Not necessarily. In tests, all air fresheners tested gave off chemicals classified as toxic or hazardous, even those advertised as "natural," "green," "organic," or that contained essential oils. Some of these chemicals have been found to be unsafe even in very small amounts.
- The toxic chemicals given off by "natural" air fresheners were not significantly different from other brands.
- The Federal Trade Commission (FTC) recently released new guidelines, the Green Guides, designed to ensure that the environmental claims made by marketers are truthful. These new guidelines discourage marketers from using general environmental claims such as "natural," "green" or "eco-friendly." Unfortunately, the guidelines are not regulations. The FTC can take action against companies that are deceptive, but they have done so in only a handful of cases over the last 20 years. Many companies continue to make claims that their products are "green," or "natural," or "organic" when these terms have no legal definition.

How to avoid fragrances and their health effects

- Choose third-party certified products that are labeled unscented or "free and clear."
- Look for products that do not have "fragrance" listed as an ingredient (but remember that fragrances are not necessarily listed on the label).
- Avoid products with a strong smell.
- Use ventilation instead of air fresheners.
- Look for items marked "phthalate-free."

Note: Products called "fragrance-free" and "unscented" are not necessarily less hazardous. Even if a product does not contain a fragrance, it could still contain other chemicals that are classified as toxic or hazardous. For more information on the chemicals in a product, read the Safety Data Sheet from the manufacturer, or check on the manufacturer's website.

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What are the most effective and safest ways of cleaning, sanitizing, and disinfecting in ECE?

Each ECE program should have a written procedure for cleaning, sanitizing, and disinfecting. State child care regulations are good sources for learning about requirements and finding examples of cleaning schedules and procedures. See Appendix D for the Caring for Our Children recommendations and requirements for cleaning, sanitizing, and disinfecting in ECE.

Routine cleaning

Cleaning physically removes visible dirt, dust, oils, and germs (microbes – viruses, fungi, and bacteria). The cleaning process uses an allpurpose detergent and water, and a scrubbing motion, just like washing our hands using soap, water, and rubbing. Always read product labels and follow directions. Cleaning should be done before sanitizing or disinfecting because germs can hide underneath dirt and debris where they escape being killed by a disinfectant. Most disinfectants require a thorough cleaning prior to application, whereas "one-step" disinfectants can clean and disinfect but require that you pre-clean heavily soiled areas. Some disinfectants, such as bleach and quaternary ammonium compounds, lose their ability to disinfect well in the presence of dirt.

High-touch surfaces (surfaces that are touched many times a day by many different hands) such as door knobs, door push bars, sink handles, shared computer keyboards and mice, telephones, microwave and elevator buttons, and light switches should be cleaned with detergent, water, and a microfiber cloth more frequently to control the spread of infectious diseases. Some state child care licensing regulations may require that some of these hightouch surfaces be disinfected as well. This is especially true if there is an outbreak of an infectious disease in your program.

Tools for cleaning

- Walk-off mats placed at all of your entryways help to capture the debris and dirt tracked in on shoes. They also reduce wear and tear on floors and carpeting. Look for good quality multi-level scraper mats with rubber backings that hold water. Where possible 15' to 20' is recommended for maximum effect, but any length will help keep the floors cleaner. Vacuum the walk-off mats daily.
- Microfiber (preferably ultra-fine high quality microfiber) cleaning cloths and mops work well for removing organic matter (dirt, oils, grease) as well as germs from surfaces. Microfibers used for cleaning are split many times to increase their absorbing capacity. Split microfiber quality varies. Microfiber that catches slightly on the surface of your hand is better quality. A laundering program is necessary if microfiber is used. This can include washing mops and cloths by hand, by machine, or using a laundering service. Laundering will help prevent the spread of germs from one surface to another (called crosscontamination). If microfiber is not available, recycled content paper towels are alternatives, but will not provide as much germ removal as microfiber.

- Vacuums come in many different shapes and styles. There are websites that rate vacuums and industrial versions are available through cleaning product distributors. (Ask your local school who they purchase their vacuums from.) Look for a vacuum with a bag indicator light that tells you when the bag should be changed. Some vacuums also have a green indicator light that tells you when no more dirt is being removed from the carpet. This helps you to know how long to vacuum a rug. Regular vacuuming also helps carpets to last longer. Dirt is abrasive and can ruin carpet fibers if it is ground into the carpet. The more often you vacuum, the more dirt you remove before it can damage carpeting. Empty the bag when it is half filled or when the indicator light comes on to ensure that the vacuum sucks at full power. Floors and carpets need to be vacuumed daily.
  HEPA or high-filtration vacuums filter out more dirt and germs than traditional vacuums. Traditional vacuums can actually blow small particles of dust back out of the vacuum and into the air! HEPA vacuums are the best choice for preventing dust from floor and carpets from getting into the indoor air. Vacuuming captures more dust and dirt than sweeping. It can also reduce exposure to compounds such as fire-retardant chemicals, lead and other metals, and some phthalates that are largely found in dust.
- Buffers and burnishers are machines used to clean, scrub or strip the finish from a vinyl floor. They also restore the glossy look to a floor that has had a finish applied. These machines can contribute to particulate matter in indoor air which can cause health problems. Buffers and burnishers should be equipped with a highefficiency vacuum to capture the particles that are created when performing these tasks. They should not be used when occupants are in the building. Installing rubber floors makes burnishing unnecessary. They only need to be scrubbed with a microfiber mop and plain water and buffed with a cleaning pad are safer than vinyl.

Carpeting tips

Carpeting can collect dust, dirt, and germs that are hard to remove. They can also trigger allergies and asthma. Smaller area rugs that can be laundered or removed for cleaning are a safer choice than wall-to-wall carpeting. If your carpeting needs replacing, choose products approved under the GreenGuard Gold certification or the Carpet and Rug Institute's Green Label or Green Label Plus program. Carpets with low pile height and low pile density are easier to clean. Request carpeting and carpet padding that does not contain formaldehyde. Research tells us that vacuuming can help reduce asthma episodes, allergies, and other health problems related to dust in indoor air. Use a vacuum with a HEPA or highfiltration filter so that the dust is retained inside the filter. Take your time and vacuum slowly. This picks up more dust and dirt. A dust finder indicator light that turns green when no more dust is being removed can be very helpful in determining if the carpet has been properly cleaned. Vacuuming should be done when children and staff are gone for the day.

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Cleaning products and procedures

A third-party certified all-purpose product is the best choice for routine cleaning. See Section 7: Choosing Safer Products for Cleaning, Sanitizing, and Disinfecting. These are available as a concentrate (need to be diluted) or in ready-touse (already diluted) form.

Surface cleaning

1. Put on non-latex chemical-resistant gloves (nitrile or neoprene are best) when using cleaning products. All cleaning products have some effect on the skin.
2. Spray or squirt the solution on a microfiber cloth or paper towel and apply to the surface to be cleaned.
3. Wipe or scrub the surface until it appears clean.
4. Rinse the cloth in clean water or, if the cloth is very soiled, use a new damp cloth (or a new paper towel) to rinse the surface.
5. Allow to air dry or wipe dry with a clean cloth if the surface is to be used immediately.
6. Dispose of towels and/or place washable cloths in a closed receptacle container or laundry basket for laundering.

Floor cleaning

1. Fill a bucket with water and add the cleaning solution (unless you have diluted the product using a dilution station, which is safer) according to label instructions. It is ideal to have a split bucket system with the cleaning solution on one side and the rinse water on the other side. This will help to keep the cleaning solution from getting dirty.
2. Place microfiber mop heads in the cleaning solution.
3. Mop each room's floor until it appears clean and then change the microfiber mop head. Bathroom floors should be mopped last.
4. Place used microfiber mop heads in a container for laundering.
5. Most floors can be cleaned and don't need to be disinfected, unless it is required by licensing regulations. If body fluids are present, disinfect floors after cleaning.
    - Apply the disinfectant to the floors following the label instructions and leave visibly wet on the floor for the recommended dwell time.
    - Rinse if required by the label instructions.

Manufacturers may claim that their products are "green," "natural," or "earth-friendly," but such claims are often meaningless or misleading. To ensure that the products you buy are safer for health and the environment, look for the certification logo of independent third-party organizations. EcoLogo and Green Seal criteria cover many characteristics, such as toxicity and corrosivity limits, and also prohibit chemicals that:

- cause allergic-type asthma;
- are carcinogens, reproductive toxicants, and some that are endocrine disruptors.

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What not to use and why

The use of cotton cloths, cotton mops, and sponges is not recommended.

Cotton cloths do not clean surfaces or capture germs as well as microfiber. They can actually spread germs from one surface to another. They do not last as long as microfiber after frequent washing. The use of cotton with a quaternary disinfectant can reduce the effectiveness of the disinfectant.

Cotton mops are much heavier, especially when fully wet, than microfiber mops and are more likely to cause injuries to the user. They can move germs from one area to another if not properly handled. It is more difficult to replace and launder cotton mop heads than microfiber mop heads.

Sponges should not be used for cleaning, sanitizing, and disinfecting because they are hard to clean and bacteria grow in them.

Carpet cleaning

Vacuum carpets at least daily or more frequently if needed, to pick up spills of food and other particles. Carpets should be thoroughly cleaned (steam cleaning recommended) every 3 months or as needed. Steam or hot water extraction cleaning is typically done by a service using equipment mounted on a truck or by a portable system brought inside the building. Hot water is sprayed under high pressure into the carpet and immediately vacuumed out along with dirt. When done properly, steam cleaning can clean even heavily soiled carpets. Sometimes detergent is also used, but low quality detergent, too much detergent, or overly concentrated detergent may leave sticky residues that can attract dirt. In case of blood or body fluid spills, wash thoroughly and rinse.

Cleaning tips

- Clean first before you disinfect. Germs can hide underneath dirt and other material on surfaces where they are not affected by the disinfectant. Dirt and organic material can also reduce the germ-killing ability of some disinfectants.
- Use warm or hot water with any cleaning product unless the label states the product is formulated to be effective in cold water.
- Scrub vigorously with a microfiber cloth to remove dirt. Use a brush if the item is not smooth or has hard-to-reach corners where dirt and germs can hide, such as toys and bottles.
- Clean completely on a regular schedule (see Appendix D or your state child care regulations for a recommended schedule) and spot clean as needed.
- Change water when it looks or feels dirty, and after cleaning bathrooms, diaper changing areas, and the kitchen.
- Clean the least dirty items and surfaces first (for example, countertops before floors and sinks before toilets).
- Store materials and toys in plastic tubs that are easier to keep clean.
- Clean from top to bottom – high surfaces first, then low surfaces.

- Apply cleaning products to a microfiber cloth with a stream or coarse spray and then wipe the surface to be cleaned (instead of spraying the product directly on the surface.) This protects the user from breathing the mist that bounces back from the hard surfaces and contaminates the air.
- Remove microfiber mop pads from the handle and hand wash, rinse, and hang to dry, or place in a bag for daily laundering. Treat microfiber cloths the same way. See Fact Sheet: What's So Great About Microfiber?

Diluting concentrated products

The safest way to dilute concentrated products is to use a product dispensing system. The dispensing system automatically dilutes the concentrate, and in doing so improves safety and conserves resources:

- It minimizes waste by correctly diluting the product. Using too concentrated a solution increases costs, but using the right amount improves how well the product works.
- It prevents exposures to you and your staff and prevents spills of product concentrates.

Ready-to-use (already diluted) products can also be purchased in bulk and transferred to smaller containers using a dispensing system to reduce exposure to chemicals. Product vendors will often provide dispensing equipment at no cost if enough product is purchased from them. When dispensing products from a larger container to a smaller one, labeling is required for the smaller "secondary" container.

Sanitizing

A sanitizer is a product or device that reduces germs on surfaces to levels considered safe by public health codes or regulations. Sanitizers work by killing germs. For food service this level should be a 99.999% reduction in the number of microorganisms within 30 seconds. The level for hard surfaces not used for food service should be at least 99.9%. Sanitizing products should state on their label the surfaces they are intended to be used on.

Sanitizing in child care is required for specific areas such as food preparation and contact surfaces, and mouthed toys and pacifiers. State child care regulations and Caring for Our Children: National Health and Safety Performance Standards, Routine Schedule for Cleaning, Sanitizing, and Disinfecting, Appendix K specify what needs to be sanitized on a regular basis. (See Appendix D: What, Where and How Often to Clean, Sanitize, and Disinfect in ECE for a copy of the CFOC recommendations.)

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Tools for sanitizing

Sanitizing can be done with a chemical product, a sanitizing device, or in a dishwasher.

- Microfiber cloths work well for spreading sanitizers on surfaces.
- Dishwashers are a great option for sanitizing dishes, eating utensils, mouthed plastic toys, and pacifiers and they eliminate the need for chemical sanitizers.
- Devices
  - Steam cleaners can be used to sanitize, deodorize, and remove grease, dirt, and product residues thoroughly and quickly without chemicals. They can be used on many surfaces, including bathroom fixtures, floors and countertops, carpeting, and upholstery. Dry vapor steam cleaners use super-heated low moisture steam – no chemicals – for disinfecting, sanitizing, and cleaning surfaces. They are very effective and approved for food contact as well as other surfaces including carpets and upholstery. They are one of the most effective ways to remove bacteria that have formed a biofilm (see page 41 for more information on biofilm).
  - No-touch cleaning systems may be used with an EPA registered sanitizer. These systems spray cleaning solution/sanitizer on soiled fixtures and floors, then wash soils to the floor using pressurized water, and finally vacuum the floor dry. The equipment includes three main components: an indoor pressure washer, a wet vacuum system, and a dilution component.

Products and procedures for sanitizing

An EPA registered sanitizer or sanitizing device that is rated for food contact surfaces should be used when sanitizing surfaces as recommended by state child care regulations or CFOC.

Sanitizing food preparation areas using a chemical sanitizer

1. Clean the surface first as described on page 36.
2. Read and follow the instructions on the product label for sanitizing food contact or other hard surfaces.
3. Sanitize the surface using a sanitizing solution mixed at the concentration specified on the label or a ready-to-use sanitizer.
4. Apply the sanitizer using a stream or squirt bottle.
5. Allow to remain on the surface for the dwell time listed on the product label. This means visibly wet. Use a timer. If the product dries before the end of the dwell time, reapply. Products that have a shorter dwell time (about 1 minute) are easier to use because they don't require reapplication.
6. See federal and state regulations for specific requirements.

Some cleaning products may claim that rinsing isn't necessary, but all products leave a residue that can contribute to particulate matter in the air over time. Rinsing non-food contact surfaces avoids this problem.

7. Place cloths in a receptacle for laundering.

Hand-washed dishes

1. If a 3-compartment sink is used, set up and use the sink in the following manner:
    - Wash dishes in the first compartment using a clean detergent solution and water at or above 110°F, or at the temperature specified by the detergent manufacturer.
    - Rinse in the second compartment with clean water.
    - Sanitize in the third compartment with a food grade sanitizing solution mixed at the concentration specified on the manufacturer's label or by immersing in hot water at or above 171°F for 30 seconds. Make sure you have the correct sanitizer concentration by using an appropriate test kit.

Automatic dishwashers

Use a dishwasher with a sanitizing cycle that is certified to meet NSF/ANSI 184 standard (See http://www.nsf.org/certified/consumer/listings_results.asp for listings). This standard helps confirm that a residential dishwasher can achieve a minimum 99.999% reduction of bacteria when operated on the sanitizing cycle. Follow manufacturer's instructions for use.

Mouthed toys (hard, non-porous surfaces only) and pacifiers

1. Place in the automatic dishwasher and follow the instructions above for dishwasher use. Only toys with hard, non-porous surfaces can be sanitized or disinfected. Toys with porous surfaces need to be laundered.
2. Boil pacifiers for one minute in drinkable water.
3. Washing by hand
    - Wash toys in a detergent and water solution and rinse with water.
    - Immerse the toys in the sanitizer solution and wait for the recommended dwell time. Rinse the toys if the label requires this step (you may want to rinse anyway, if children are mouthing the toys). Allow to air dry or dry with a clean cloth or paper towel.

    For toys that cannot be immersed:

    - Apply the sanitizer according to label instructions by spraying or squirting the product on one side of the toy and waiting for the recommended dwell time, then the other side and wait again. Rinse with clean water and air-dry or dry using a clean microfiber cloth or a paper towel.

Electronics/keyboards

1. A flexible silicone cover makes cleaning and sanitizing keyboards much easier.
2. Wipe with a sanitizer and a clean microfiber cloth or a paper towel. Don't spray sanitizer on a keyboard. Sanitizing wipes can also be used on keyboards.

Dirt can make disinfectants less effective – clean first, then disinfect.

Disinfecting

Disinfecting works by using chemicals or devices to kill almost all the germs on surfaces or objects. This process does not necessarily clean dirty surfaces or remove germs. By killing germs on a surface after cleaning, the risk of spreading infection is lower. Disinfecting kills germs on contact, whereas cleaning works by washing away the germs that can be removed. Areas to be disinfected include door and cabinet handles touched by children, drinking fountains, bathroom fixtures, and objects in toilet and diapering areas.

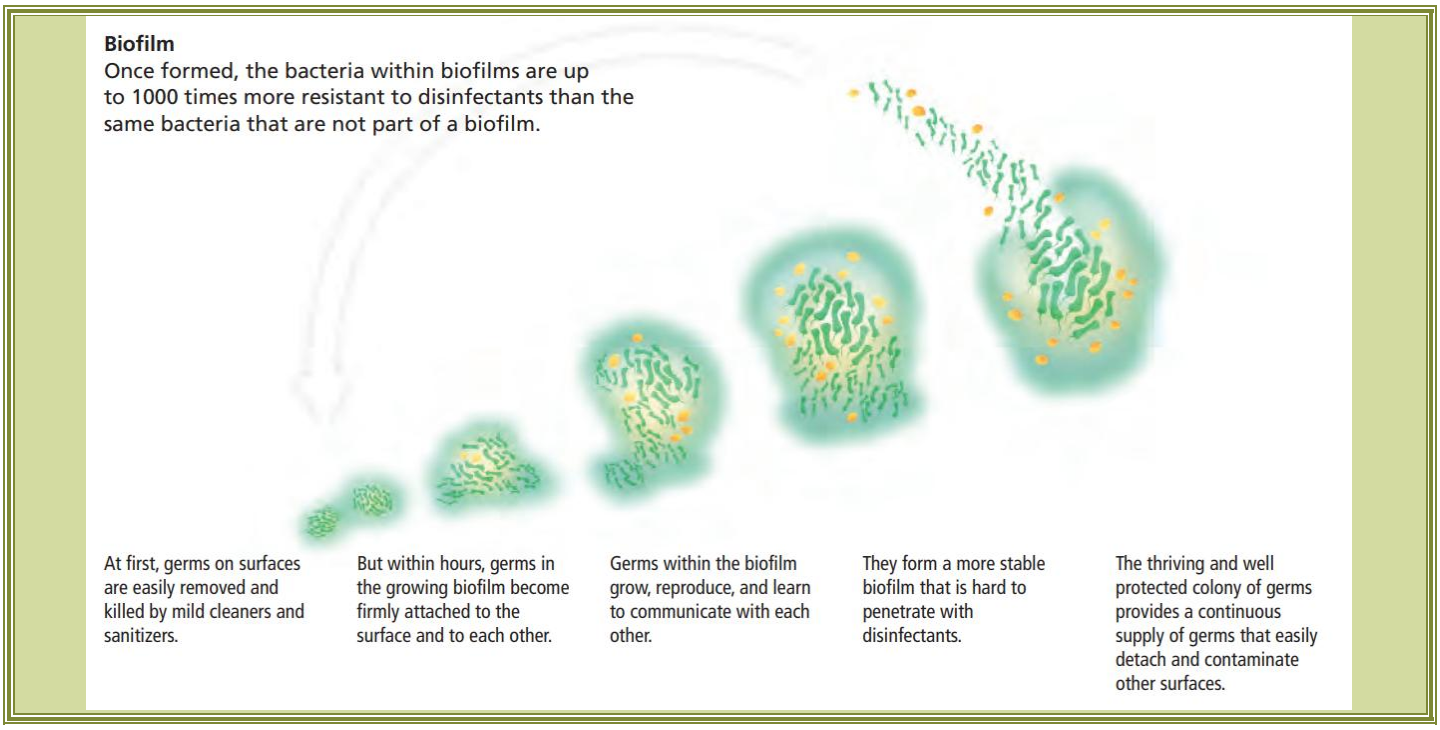
Bacteria, a type of germ, are sometimes able to form dense mats called biofilm that form a protective environment for germs. Biofilms form on surfaces that are constantly wet. When bacteria land on a hard, moist surface, they can easily be removed. But if they are not removed, they form stronger attachments to surfaces and to each other, creating a community within a protective shell that increases their ability to survive and grow. This biofilm develops within hours. It protects the bacteria from cleaners and disinfectants, which can kill only the bacteria on the outer layer. Once formed, the bacteria within biofilms are up to 1000 times more resistant to disinfectants than the same bacteria that are not part of a biofilm. To reach the microbes within the biofilm, friction must be used to break down the shell. Microfiber cloths or mops, brushes, or steam vapor can be used to penetrate the biofilm. Key places in ECE buildings where biofilms develop are continuously damp or wet areas around sink faucets, food preparation areas, and drains. To prevent the development of biofilm, keep surfaces clean and dry. Water and food are what bacteria require in order to grow and form biofilm.

Tools for disinfecting

- Microfiber cloths or paper towels for applying disinfectants to surfaces
- Microfiber mops for floors
- Devices
    - Dry vapor steam cleaners have been shown to be very effective for disinfecting and is approved for food contact surfaces as well as other surfaces

Products and procedures for disinfecting

An EPA-registered disinfectant is required to disinfect an area. See http://nrckids.org/STATES/states.htm to check your state's regulations for more specific information. Many states require the use of a hospital-grade disinfectant in ECE.



Hard surfaces (drinking fountains, toilets, etc.)

1. Put on chemical-resistant gloves (nitrile, rubber are best) and other personal protective equipment as recommended on the label when using disinfectants.
2. Follow the instructions for surface cleaning.
3. Follow the instructions on the disinfectant product label to disinfect surfaces correctly.
4. Spray or squirt the disinfectant on the microfiber cloth or paper towel and apply to the surface, or squirt the product directly on the surface so that the surface is visibly wet. Avoid fine aerosol sprays. They can be inhaled and irritate the lungs. Some can cause or trigger asthma.
5. Allow to remain visibly wet on the surface for the dwell time listed on the product label. Reapply if needed for the surface to stay wet for the entire dwell time.
6. Rinse with a clean microfiber cloth or paper towel if required by label instructions.
7. Allow to air-dry, or wipe dry with a clean cloth, if the surface is to be used immediately.
8. Dispose of paper towels and place washable cloths in a receptacle for laundering.

Bathroom floors

1. Follow the instructions for cleaning floors.
2. Read and follow the instructions on the label for the correct way to use the product selected for disinfecting floors. There may be separate instructions (on the product label or in state regulations) on how to disinfect if body fluids are present.
3. Place clean microfiber mop heads in the disinfecting solution or squirt disinfecting solution directly on the area to be disinfected. Use the mop to spread the disinfectant until the surface is visibly wet.
4. Allow the disinfectant to remain wet on the floor for the recommended dwell time. Reapply if needed for the floor to remain visibly wet for the entire dwell time.
5. Rinse if required by label instructions using a clean microfiber mop head or cotton mop that has been washed and rinsed in clean water and allow to air-dry.
6. Hang cotton mops to dry or launder immediately (do not leave soaking in a bleach solution) and place microfiber mop heads in a separate container for laundering.

What is a Hazard Communication Program?

By law, every employer is responsible for providing their employees with a safe and healthy work place. Communicating to employees about chemical hazards present in the workplace is an important part of this responsibility. The OSHA Hazard Communication Standard (HCS) requires chemical manufacturers, importers, distributors, and employers to provide hazard information to employees and customers.

As employers, ECE programs must have someone, such as a child care health advocate, on staff who is trained to recognize the potential hazards of diverse chemicals. A hazardous chemical is any chemical that is

- a physical hazard (for example, it might explode or start a fire);
- a health hazard (it may cause short- or long-term health effects in employees who are exposed).

Someone on your ECE staff must also know how to protect your facility's employees from these hazards through

- work policies and procedures;
- the use of personal protective equipment (PPE).

Information about the products used in ECE and their health hazards must be available and understandable to your ECE staff. ECE employees have both a need and a right to know what chemicals they are exposed to when working and the hazards of those chemicals.

Where does the Hazard Communication Standard apply?

This OSHA requirement applies anywhere employees may be exposed to hazardous chemicals. In ECE, cleaners, sanitizers, and disinfectants typically used by staff in their routine work and in emergencies are potentially hazardous to both staff using them and the children in the facility. Therefore, OSHA's HCS applies to all ECE staff members who work with these products.

What does the Hazard Communication Standard require?

This standard requires the facility to develop a written Hazard Communication Program that includes the following:

- Your plans for managing your Safety Data Sheets, which provide information on the chemical products in your facility, and a labeling system for product containers
- How you train your employees about hazardous products and their safer use and management
- A list of hazardous products used in your facility
- Methods to inform employees of the hazards of non-routine tasks involving hazardous products, such as emergency response spill clean-up
- Methods to communicate hazards to outside contractors who may be exposed to hazardous products in your ECE facility

Safety Data Sheets (SDSs) for hazardous products

SDSs (formerly Material Safety Data Sheets, or MSDSs) provide important information that you will need to safely manage the chemical products used in your ECE facility. ECE programs and staff should use the SDSs for the products they use

- as sources of information about hazards;
- to obtain advice on what safety precautions to take when using the product.

The SDS provides general information about the product. It does not help you with the specific precautions you should take when the product is used in an ECE environment. However, the SDS information enables you to develop a program to protect your staff and the children in your program. A product's SDS also provides information for others who may need information about the product, such as emergency responders and poison control centers.

- You must obtain an SDS from your supplier or from the internet for each hazardous product used in your facility.
- SDSs for the hazardous chemicals must be kept on site and readily accessible to employees when requested.

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Label requirements for containers of hazardous products

- Original labels must be attached to containers of hazardous products when they are purchased.
- Secondary containers are the containers you use when you take product out of an original container and put it into another container, such as a spray bottle. All secondary containers of hazardous products must be labeled with the following information:
  - The name of the hazardous chemical(s)
  - Warnings for specific hazards:
    - Health hazards with the parts of the body that may be affected (such as eyes, skin, and respiratory system)
    - Physical hazards (for example: flammable)
    - The name and address of the chemical manufacturer
- Labels must be:
  - Readable and understandable
  - In English
  - Prominently displayed
- Removing or defacing labels on incoming containers of hazardous products is prohibited.

Information and training

- Information and training on hazardous products must be provided
  - when employees are hired;
  - when new physical hazards or health hazards are introduced into the work area;
  - annually.
- The information provided must include the regulatory requirements described above, as well as the following:
  - The work areas where hazardous products are present
  - The location and availability of the written Hazard Communication Program, the list of hazardous chemicals, and SDSs
  - An explanation of an employee's "Right to Know" about the chemicals being used in the workplace and their health and safety risks
  - A plan of whom to contact and what to do in an emergency involving a hazardous product
- The training on hazardous products must include information about the following:
  - How to detect the presence or release of a hazardous chemical (such as visual appearance or odor).
  - The possible physical or health hazards of the materials used in the ECE program
  - How ECE staff can protect themselves from product hazards, including work practices, emergency procedures, and personal protective equipment such as gloves or mask
  - The information in the Hazard Communication Program, including how employees can obtain and use hazard information
  - How to understand and use SDSs
  - How containers should be labeled

- What to do in case of a product spill or contact with a hazardous product
- How to dispose of unused hazardous products and packaging

The Hazardous Materials Identification System (HMIS®)

This labeling system provides "at-a-glance" communication of information to employees on the hazards of a product. The label identifies

- general health, flammability, and physical hazards using color-coded fields;
- recommendations for personal protective equipment that should be used when working with the product.

Using the HMIS label on all containers in your facility will help you to meet OSHA's Hazard Communication Standard. It is recommended that they be used on all containers, even if the manufacturer's label is still in place. Blank and product specific preprinted HMIS labels can be purchased online or may be available from the distributor who sold the product.

Blue indicates health hazard, red indicates flammability, yellow indicates instability (for example, is it flammable or explosive), and the white section provides special information (such as what personal protective equipment to wear). The HMIS also uses a numerical system from 0-4 to indicate the severity of the hazard.

Using the HMIS label on all containers in your facility will help you to meet OSHA's Hazard Communication Standard.

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What is the most effective and safest way to clean body fluids and blood spills in ECE?

Unlike most other spills, blood, feces, and vomit require more careful cleaning methods. These spills can endanger your health. The following guidelines are meant to ensure that body fluid spills (BFSs) are cleaned in a manner that prevents any possibility of future illness related to the spill. (This protocol does not apply to diaper changing areas where fecal contamination has occurred; this is addressed in diaper changing protocols.) This procedure is also part of the Centers for Disease Control and Prevention's "Standard Precautions" for the prevention of the spread of infectious disease. This means that you must treat all blood and other potentially infectious material as if it is contaminated by pathogens (germs).

Responding to Body Fluid Spills (BFSs) on porous and nonporous surfaces

This OSHA requirement applies anywhere employees may be exposed to hazardous chemicals. In ECE, cleaners, sanitizers, and disinfectants typically used by staff in their routine work and in emergencies are potentially hazardous to both staff using them and the children in the facility. Therefore, OSHA's Hazard Communication Standard (HCS) applies to all ECE staff members who work with these products.

1. Secure area and notify staff and other responders.
2. Prepare to clean up:
    - Bring prepared spill kit to spill site if there is a BFS.
    - Select a disinfectant that is registered by the U.S. EPA to disinfect blood spills. Look for this information on the label. Select a cleaner for carpets and a disinfectant for hard surfaces.
    - Put on personal protective equipment (PPE) (gloves, eye protection, and mask).
3. Remove contaminated objects, spill, and spill waste
    - Cover all spills with absorbent powder and/or disposable paper or cloth towels, use the kit dustpan to remove these materials.
    - Soak up any liquid absorbed into porous surfaces (like carpeting) with disposable rags. Then wash surface thoroughly and rinse.
    - Use nonporous equipment such as a dustpan or tongs (not hands or vacuum) to pick up contaminated sharp items such as needles and broken glass.
4. Disinfect hard, non-porous surfaces
   Apply disinfectant and leave the disinfectant visibly wet on the surface for the required dwell time.
    - For horizontal surfaces, pour disinfectant directly on to spill area.
    - For vertical surfaces, spray the disinfectant onto a cloth and wipe on surface.
5. Dispose of spill waste
    - Place all materials used in the cleaning process, including PPE, sharp objects, etc., in the bucket with a double-lined plastic bag. Dispose of this waste in the dumpster.

6. Follow-up
    - Remove your contaminated clothing, double-bag it in 2 mil. bags, label, wash separately in a washing machine in hot water, and dry on high setting.
    - Wash your hands and other areas of your body that come into contact with the disinfectant or body fluid spill immediately after spill clean-up for at least 20 seconds with liquid soap under hot running water.
    - If soap and water are unavailable, use waterless hand sanitizer right away, and then wash hands as soon as possible. The hand sanitizer will not work effectively in the presence of blood.
    - If you have had an unprotected exposure, immediately contact your program director or a physician. Allow reentry to area of spill when:
        - all materials are removed;
        - area is clean, properly disinfected, and dry.

What is a spill kit?

A spill kit is used to clean and decontaminate areas where blood spills have occurred. Having a spill kit prepared makes it less stressful to clean up a spill. They are safe for use by staff and include personal protective equipment for users as well as special cleaning/decontamination agents. They can be purchased or made. You will need the following items: u Personal protective clothing that is disposable, including gloves, goggles, and an N95 mask. A paper gown should be included to protect your clothing from cross-contamination when there is a large spill. u Paper towels and an absorbent material. Commercially available absorbent material for spill kits can be purchased. Cat litter or vermiculite can also be used. They are relatively inexpensive and work well, although they are messy. u Tongs and a dustpan u An EPA-registered disinfectant u Plastic bags (red will help identify the contaminated contents)

Resources

https://www.ctoec.org/wp-content/uploads/2019/02/ece_curriculumfinal.pdf