

Green Cleaning, Sanitizing, and Disinfecting: *A Curriculum for Early Care and Education*



This *Green Cleaning, Sanitizing, and Disinfecting Toolkit for Early Care and Education* was developed by the University of California, San Francisco School of Nursing's Institute for Health & Aging, University of California, Berkeley's Center for Environmental Research and Children's Health, and Informed Green Solutions, with support from the California Department of Pesticide Regulation.

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This Toolkit is dedicated to the Early Care and Education (ECE) program providers, custodial staff and children who live and work in ECE facilities across the United States. ECE staff work tirelessly to care for our nation's children. We hope that these materials will contribute to healthier ECE environments and to improved health for those who spend time in them.



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Introduction



This *Green Cleaning, Sanitizing, and Disinfecting Toolkit* will help you make changes in your early care and education (ECE) program so you can better maintain your facility while also reducing infectious disease. The Toolkit presents practical information on how to

- ◆ **keep ECE environments clean and safe using practices and products that are less hazardous to health and the environment;**
- ◆ **protect young children and staff from infectious diseases.**

Group care of young children provides ideal conditions for the spread of infectious disease. Children in ECE get sick more often, and are hospitalized more often when they do get sick, compared to children cared for at home. Parents must also take time off from work to care for sick children.

Research shows that there are several steps that can reduce the risk of infectious disease in ECE:

- ◆ **Development of written policies for reducing the risk of infectious disease**
- ◆ **Education of child care center staff about infection control practices that is repeated on a regular basis, preferably**
 - ◇ every year
 - ◇ when new products or policies are introduced
 - ◇ when new employees are hired
- ◆ **Careful and frequent handwashing by both staff and children**

- ◆ **Appropriate cleaning and targeted disinfection of contaminated surfaces when necessary**
- ◆ **Separation of food preparation, toileting, and diaper changing activities**
- ◆ **Vaccination of children and staff**

Why should we change the way we clean, sanitize, and disinfect?

ECE programs prevent infectious disease by using cleaning, sanitizing, and disinfecting products. In the past, little thought was given to the risks posed by these products. Many people mistakenly think that if a cleaning, sanitizing, or disinfecting product is sold to the public it has been reviewed and proven safe by government agencies. The U.S. Environmental Protection Agency (EPA) requires that products labeled as sanitizers or disinfectants do kill the germs that the product claims to kill, but the registration review does not evaluate all possible health risks for users of the products. Cleaning products are also not routinely reviewed by the government to identify health risks to the user. Some manufacturers choose to have the EPA evaluate their cleaning products for human health and environmental safety through the Design for the Environment (DfE) Safer Product Labeling Program, but this is voluntary and most products are not reviewed.

We are constantly learning more about the potential health problems of cleaning, sanitizing, and disinfecting products. Some of these chemicals affect air quality and can cause or trigger health problems such as asthma. For example, 11% of people with work-related asthma in California connected their asthma to cleaning and disinfecting products. Over half of these patients never had asthma before being exposed to the products – inhaling the products caused their asthma. Four out of the 5 people diagnosed with work-related asthma in this study were bystanders. They were not working directly with cleaning or disinfecting chemicals. They were simply nearby and exposed to them.

Because these products have risks, it is important to choose the safest products available. Many companies are developing new, effective products that contain less hazardous chemicals and are safer.

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, 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*.

Some of the questions we hear often from ECE providers are:

- ◆ Which products should be used to clean?
- ◆ Which areas should be sanitized and which should be disinfected and how often? What is the difference?
- ◆ What sanitizing and disinfecting products are safe to use?
- ◆ How do we comply with child care licensing regulations?
- ◆ Can disinfectants make us sicker than the diseases they are meant to prevent?
- ◆ Can I use bleach safely?
- ◆ If a product says that it is "green," is it safe to use?

This Toolkit will help you answer these questions. In this Toolkit you will find information on

- ◆ **what infectious disease is and how it is spread;**
- ◆ **the differences between cleaning, sanitizing, and disinfecting and when and where each is needed;**
- ◆ **the health and environmental hazards associated with using and misusing cleaning, sanitizing, and disinfecting products;**
- ◆ **choosing safer cleaning, sanitizing, and disinfecting products;**
- ◆ **proper cleaning, sanitizing, and disinfecting techniques;**
- ◆ **non-chemical practices and tools that can reduce the spread of infectious disease;**
- ◆ **the resources needed for ECE programs to create their own policies and protocols for**
 - ◇ **establishing a green cleaning program,**
 - ◇ **purchasing safer, and possibly less expensive, cleaning, sanitizing, and disinfecting products,**
 - ◇ **using cleaning, sanitizing, and disinfecting products appropriately,**
 - ◇ **negotiating a contract for cleaning services with an outside vendor.**

What this Toolkit includes

- ◆ *This Green Cleaning, Sanitizing, and Disinfecting for Early Care and Education curriculum booklet*
- ◆ 4 posters
- ◆ Stand-alone fact sheets for ECE providers
- ◆ 2 fact sheets for families
- ◆ A Choosing Green Cleaners, Sanitizers, and Disinfectants wallet card
- ◆ A *Green Cleaning, Sanitizing, and Disinfecting Checklist* to help you develop and maintain a safe and healthy cleaning, sanitizing, and disinfection program



We hope you find the Toolkit useful. All of the Toolkit materials, as well as references for each section of this curriculum, are also available online for download at no cost. You can find them at:

<http://cerch.org/greencleaningtoolkit/>

<http://www.informedgreensolutions.org/?q=publications/green-cleaning-toolkit>

http://apps.cdpr.ca.gov/schoolipm/childcare/toolkit/green_cleaning/main.cfm

Information on obtaining additional copies of the Toolkit can be found on these websites as well.

Section 1: What is 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 one-half 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, (See “How do germs get into our bodies?” on page 6);
- ◆ **pinworms, which are also spread by the fecal-oral route;**
- ◆ **scabies, which are mainly spread by skin-to-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 | ◆ stool (feces) |
| ◆ mucus | ◆ urine |
| ◆ saliva | ◆ discharges from the eyes and skin lesions |
| ◆ vomit | |

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.

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.
- ◆ 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.
- ◆ 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 life-threatening 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 (See Section 11 for information on cleaning up a blood spill).
- ◆ 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.

Section 2: 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.

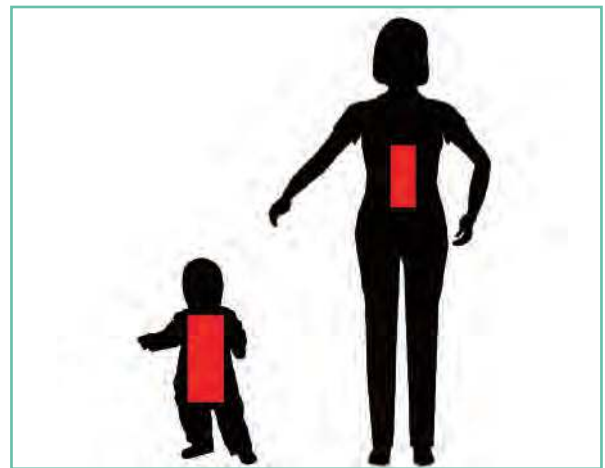
Children are more vulnerable

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.



Section 3: 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 long-term 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

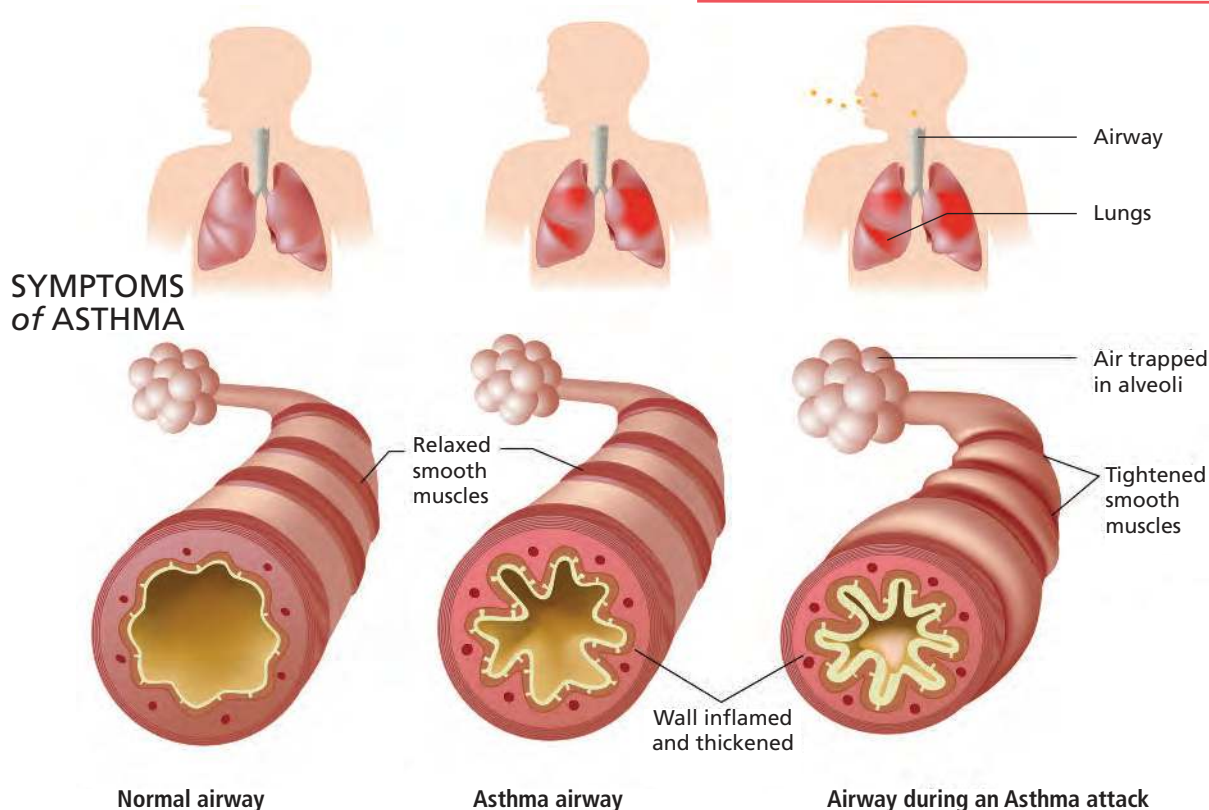
- ◆ the chemicals in the product are hazardous;
- ◆ the product is used in a way (such as not following the label directions) that increases exposures to the chemicals.

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
 - chest tightness
 - coughing
 - 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 Disruptors?) and may lead to the development of antibiotic-resistant 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 DISRUPTORS?

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.



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

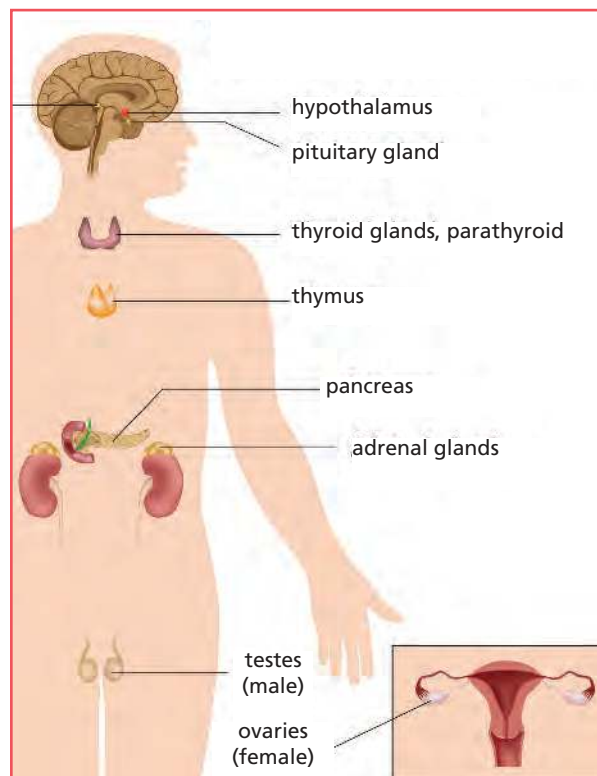
◇ **Fragrances** are mixtures of many chemicals, including VOCs. They can contain up to 3,000 separate ingredients. There is no requirement that fragrance ingredients be listed on the product label. Many of these chemicals:

- ◇ **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.

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.

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 nutrients into energy and building materials to meet your body's needs.

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.

Section 4: 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.

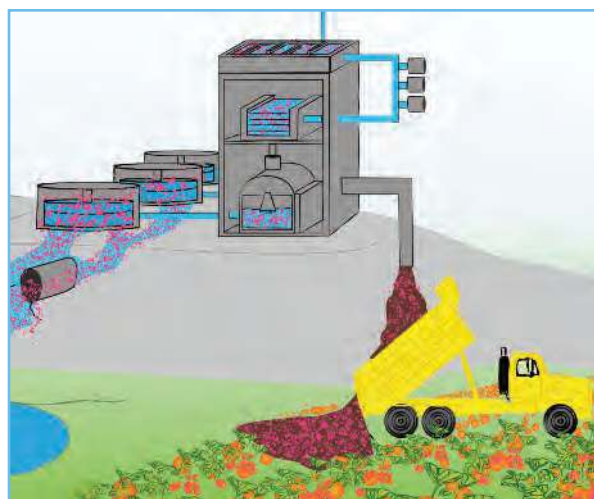
The transport of triclosan to wastewater treatment plants occurs when people

- ◆ 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.

For more information on fragrances, see Section 6.

Section 5: 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, see state child care regulations and Appendix 5: *The Caring for Our Children: National Health and Safety Performance Standards, Routine Schedule for Cleaning, Sanitizing, and Disinfecting*.

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.

The U.S. EPA regulates sanitizers and disinfectants as pesticides. The U.S. Food and Drug Administration (FDA) regulates sanitizers used on food contact surfaces. Sanitizing and disinfecting require the use of

- EPA-registered chemical sanitizers and disinfectants;
- disinfecting/sanitizing water-based devices (for example, those that use steam).

A pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. We think of pesticides when we think of getting rid of ants or cockroaches, but germs are also pests and the products used to kill them are pesticides.

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:

- ❶ 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.
- ❷ 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.
- ❸ 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:

- ❶ *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 high-quality 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 door-knobs, 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/CF0C3/> 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.



Section 5: What is the difference between cleaning, sanitizing, and disinfecting and how do these tasks help control infectious disease in ECE?

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* on page 58.



Sanitizing and disinfecting requirements and recommendations comparison chart

Surface	CA Child Care Licensing Required	Frequency	<i>Caring for Our Children</i> 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. See Section 11 for information on cleaning up body fluids spills.

For areas not mentioned in the *Caring for Our Children* recommendations or your state regulations, consider whether the area is a high-touch 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.

Section 6: 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 infection-control 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. (See Fact Sheet: *Handwashing* for tips on handwashing.)



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-to-read/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. Hands-free 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 tight-fitting 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 air-conditioning (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.



Section 7: 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 peroxide-based 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-dfe-pilot.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 Section 10: *What is a Hazard Communication Program* for more information on how to read a SDS.

Section 8: 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.

Section 9: 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 all-purpose 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.

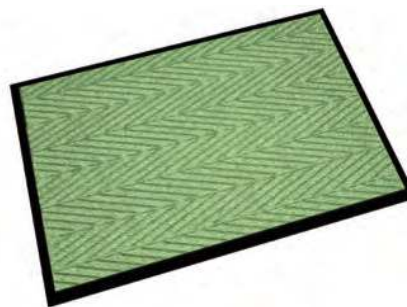


High-touch surfaces (surfaces that are touched many times a day by many different hands) such as door knobs, door push bars, sink handles, shared computer keyboards

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 high-touch 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 cross-contamination).

See Fact Sheet: *What's So Great About Microfiber?* 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 high-efficiency 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 high-filtration 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.

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-to-use (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.

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.



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.

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.



A dispensing system protects your staff, assures proper dilution, and can save on product costs.

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. See Section 10: *What is a Hazard Communication Program?*

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.)

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. (See Appendix D: *What, Where and How Often to Clean, Sanitize, and Disinfect in ECE.*)

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



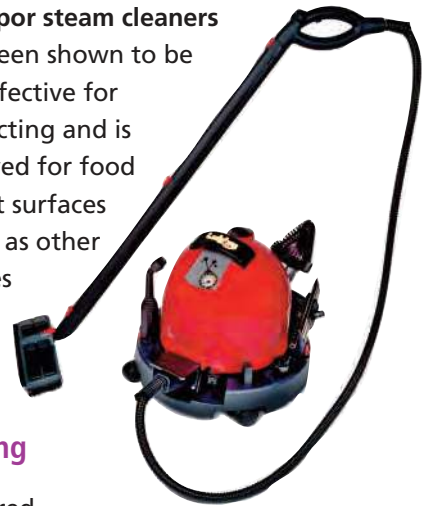
disinfected include door and cabinet handles touched by children, drinking fountains, bathroom fixtures, and objects in toilet and diapering areas. (See Appendix D: *What, Where and How Often to Clean, Sanitize, and Disinfect in ECE.*)

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

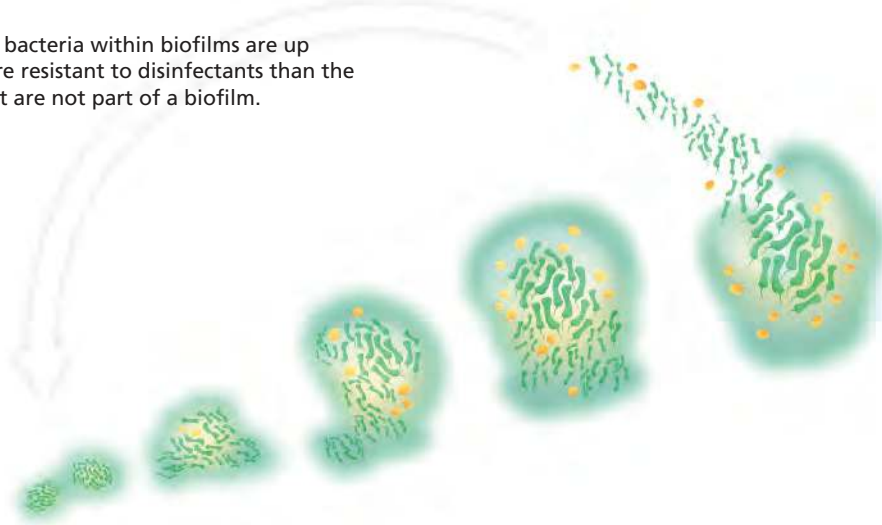


Products and procedures for disinfecting

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.

Biofilm

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.



At first, germs on surfaces are easily removed and killed by mild cleaners and sanitizers.

But within hours, germs in the growing biofilm become firmly attached to the surface and to each other.

Germs within the biofilm grow, reproduce, and learn to communicate with each other.

They form a more stable biofilm that is hard to penetrate with disinfectants.

The thriving and well protected colony of germs provides a continuous supply of germs that easily detach and contaminate other surfaces.

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 on page 36.
- 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 on page 36 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.



Section 10: 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.

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.

PRODUCT IDENTIFIER Reference SDS:	Danger: <input type="checkbox"/> Warning: <input type="checkbox"/>	HEALTH HAZARD  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/>									
	PHYSICAL HAZARD  <input type="checkbox"/> <input type="checkbox"/>										
	PHYSICAL HAZARD  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/> <input type="checkbox"/>										
	TARGET ORGAN EFFECTS					 <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>					
	ENVIRONMENTAL HAZARD  <input type="checkbox"/>					PERSONAL PROTECTION <input type="checkbox"/>					
PERSONAL PROTECTIVE EQUIPMENT  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>											

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

Section 11: 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).

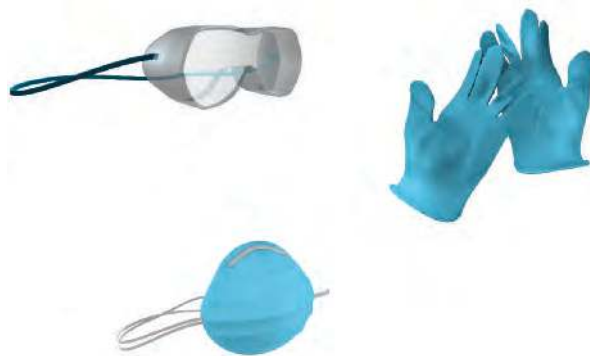
Responding to Body Fluid Spills (BFSs) on porous and nonporous surfaces

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:

- ◆ 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.
- ◆ 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.
- ◆ Tongs and a dustpan
- ◆ An EPA-registered disinfectant
- ◆ Plastic bags (red will help identify the contaminated contents)



Glossary

acute effects: nearly immediate signs and symptoms of illness as a result of exposure to harmful agents.

acute toxicity: harmful health effects from a single dose or exposure to a toxic chemical or other toxic substance.

aerosol: a term that in common use refers to a spray can that emits solid or liquid particles into the air.

air freshener: products used to mask unpleasant smells. They contain formaldehyde, phthalates, and other chemicals harmful to health. They are highly flammable, strong irritants to eyes, skin, and throat. Solid fresheners can cause death if eaten by people or pets.

ammonia: a general-purpose cleaner used on many household surfaces including glass, porcelain, and other areas meant to be streak-free. Ammonia-based products are also used for cleaning ovens and soaking items to loosen baked-on grime. Exposure to high concentrations of ammonia in ambient air or in an unventilated area can cause skin irritation, eye irritation, and burning of the nose, throat, and lower airway. Ammonia can cause asthma.

antibiotic resistance: when many bacteria are no longer killed by the antibiotics that are usually used to kill them. The bacteria are now "resistant" to these antibiotics and continue to multiply even if you are taking antibiotics. This is a major problem leading to the development of more severe diseases, and in some cases death, when in the past the problem might have been easy to cure.

antimicrobial pesticides: see disinfecting agents.

asthma: chronic inflammatory disorder of the airways in the lungs that results in one or several of the following signs/symptoms: wheezing, coughing, chest tightness, and/or trouble breathing.

bioaccumulate: when more of a chemical is absorbed and stored by the body than is broken down by or eliminated from the body.

biodegradable: the ability of a product to break down in the environment once it enters

wastewater treatment plants, rivers and streams or landfills. Unfortunately, the term biodegradable is unregulated. As a result, most cleaning supply manufacturers state that their product is biodegradable. It is important to assume that a product with the label is no better without the label.

biofilms: thin armored fortresses that microbes build to live, breed, and hide in. Biofilms form when a "community" of germs (bacterial, fungal, algal) attaches to a moist surface by secreting a slimy, glue-like substance.

body fluid spill (BFS): spill of bodily fluids such as vomit, blood, or feces as a result of an illness or injury. Special precautions need to be taken by the ECE provider when cleaning a BFS.

bleach alternatives (usually referred to as chlorine-free bleach): products that contain a bleach alternative such as oxygen bleach or hydrogen peroxide. Oxygen bleach and hydrogen peroxide are less hazardous than chlorine bleach. If a bleach product must be used, avoid chlorine bleach and use chlorine-free alternatives.

chronic toxicity: adverse health effects from repeated doses of a toxic chemical or other toxic substance over a relatively prolonged period of time, generally greater than one year.

cleaning: helps reduce the number of infectious diseases that are passed around in an ECE program by removing and washing some germs down the drain. This is a safer way to eliminate germs when less hazardous cleaning agents are used. Cleaning also removes dirt and organic matter that can reduce the effectiveness of sanitizers and disinfectants.

corrosive: a chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. Chemicals can also be corrosive to inanimate surfaces. For example, bleach is corrosive to stainless steel.

detergents: agents that remove soil and organic material from surfaces. This allows for a disinfectant to reach and destroy germs within or beneath the dirt.

direct contact: when body fluids are directly transferred from one person to another and result in spread of infectious disease. Examples of direct contact are touching, kissing, and sex. An animal bite is also an example of the spread of germs by direct contact.

disinfecting: a process needed if the surface or item must be free and clear of all visible and microscopic organisms. Disinfecting a surface will “kill” up to 99.999% of microscopic organisms within 10 minutes, or as claimed on the label of a particular product.

disinfecting agents: products registered by the Environmental Protection Agency (EPA) as “antimicrobial pesticides” that are used to control, prevent, or destroy harmful microorganisms (bacteria, viruses, or fungi) on inanimate objects and surfaces. Antimicrobial products include sanitizers, disinfectants, and sterilants (which completely eliminate or destroy all forms of microbial life, including spores). They must be certified by the EPA before they can be labeled a disinfectant.

dwell time: the amount of time that a sanitizer or disinfectant must be in contact with the surface, and *remain wet*, in order to achieve the product’s advertised kill rate.

early care and education (ECE): an umbrella term used for the different types of programs that provide the education and care of children 0 - 5.

endocrine disrupting chemicals (EDCs): compounds that in very small amounts cause illnesses by interfering with or mimicking the natural hormonal functions of the body. Many chemicals used in fragrances and fragranced cleaning supplies, pesticides, plastics, and personal care products are EDCs. Exposure to EDCs not only poses a health risk during exposure, but also increases risk of developing diseases later in life. They can be especially harmful to the developing fetus.

formaldehyde: a colorless, flammable, strong-smelling chemical that is used in building materials and to produce many household products. Exposure to formaldehyde can lead to cancer and decreased brain activity. Exposure may

also result in watery eyes, coughing, wheezing, nausea, skin irritation, and burning sensations in the eyes, nose, and throat.

fragrance: any substance, either natural or man-made, which conveys an odor or scent. More than 3,000 chemicals are used in fragrances.

indoor air pollution/indoor air quality: the level of pollution in and around the buildings and structures that we live, work, and play in. Poor indoor air quality can lead to illness.

infectious disease: diseases that are spread from one person (or animal) to another. Sometimes called communicable or contagious diseases. These may be caused by virus, bacteria, fungus, protozoa, or other microbes.

microfiber: very effective cleaning material made of tiny wedge-shaped fibers that pick up and hold much more dirt, dust, bacteria, and other microbes than a traditional cotton-based cleaning product.

nonporous surface: a smooth, solid surface without pores or holes that limit penetration of liquid below the immediate surface.

neurotoxin: toxic substances from chemicals, microorganisms, plants, or animals that interfere with the development and functioning of the nervous system.

parabens: a class of chemicals used extensively by both the cosmetic and pharmaceutical industries as a preservative. Parabens can disrupt the hormone (endocrine) system and have been linked to breast cancer.

porous surface: untreated woods, fabrics, and other surfaces that allow absorption of liquids through the top surface.

personal protective equipment (PPE): clothing worn to protect workers from hazards such as chemicals and germs.

phthalates: chemicals used to make plastics softer and/or more flexible and more durable. Some are endocrine disruptors. For example, they have been found to mimic female hormones, resulting in feminization of boys. They are found in air fresheners, in fragrances in cleaning, sanitizing, and disinfecting products, as well as in toys,

shower curtains, vinyl flooring, lubricants, adhesives, laundry detergents, nail polish, hair spray, and shampoo. In many instances phthalates are not identified on product labels. Exposure can occur through direct contact with products containing phthalates, through leaching of phthalates into other products, or through general environmental contamination. Phthalates do not remain in the body long, but most people have measurable levels of phthalates in their urine because we are exposed to them constantly.

reproductive toxic chemical (toxicant): a chemical that causes damage to or disease in male or female reproductive systems or organs, or that harms unborn fetuses.

respiratory irritant: any substance which can cause inflammation or other harmful reactions in the respiratory system (lungs, nose, mouth, larynx and trachea). Examples of respiratory irritants include tobacco smoke, ozone, bleach and some other inhaled household cleaners, sanitizers and disinfectants.

respiratory sensitizer: a substance that causes an allergic reaction in the respiratory system. Once a person is “sensitized” to this substance, further exposure to even tiny amounts will produce symptoms. Sensitization generally happens after several months or even years of breathing in the sensitizer. Can cause symptoms ranging from those that are like a mild cold or flu to severe asthma symptoms including wheezing, chest tightness, shortness of breath, difficulty breathing and/or coughing.

routine disinfection: the elimination of 99.999% of germs from hard surfaces on a regular basis, as required by regulation.

Safety Data Sheet (SDS): formerly called Material Safety Data Sheet or MSDS. Contains information on the potential health effects of exposure to chemicals or dangerous substances. The SDS contains information on how to safely use and manage a hazardous product, appropriate personal protective equipment to use, and emergency procedures to follow. The SDS

also provides information on how to recognize symptoms of overexposure and what to do if such incidents occur.

sanitary: the conditions that protect the health of the people in a building, especially cleanliness and reduced exposure to disease-causing germs.

sanitize: to reduce to a safe level, but not totally eliminate, microorganisms on a treated surface.

sensitizer: material that can cause severe skin responses such as dermatitis and/or respiratory responses such as asthma in a sensitized person after exposure to a very small amount of the material. Sensitization develops over time. When a person is first exposed to a sensitizer, there may be no obvious reaction. However, future exposures can lead to increasingly severe reactions in sensitized individuals. Not all exposed persons will react to sensitizing materials.

surfactant: chemical used in certain cleaning products that help to loosen dirt and grease from surfaces so that they can be washed away. Some are safer than others. See the Design for the Environment website for information on which surfactants are healthier for both you and the environment.

terpenes: chemicals found in pine, lemon, and orange oils that are used in many cleaning and disinfecting products as well as in fragrances. Terpenes vary in toxicity and can react with ozone to produce a number of compounds, including formaldehyde, which causes asthma and cancer.

third-party certified products: cleaning products that have been reviewed by one of the following agencies:

EcoLogo™

Green Seal™

Design for the
Environment

triclosan: an antibacterial chemical used in various soaps and household cleaners.

volatile organic compounds (VOCs): hazardous chemicals that easily evaporate and get into the air. VOCs are released from cleaning products such as aerosol sprays, liquid cleaners, dry cleaners, solvents, glues, and adhesives.

Resources

Resources by section

Section 1: What is infectious disease?

Aronson, S. and Shope, T. (2013) "Managing Infectious Diseases in Child Care and Schools: A Quick Reference Guide," American Academy of Pediatrics, Third Edition.

Healthy Child Care, "Preventing and Managing Infectious Diseases in Early Education and Child Care" <http://www.healthychildcare.org/HealthyFutures.html>

National Education Association, "The Stomach Bug Book: What School Employees Need to Know" <http://www.neahin.org/assets/pdfs/stomach-bug-book.pdf>

Rotbart, H., (2008) "Germ Proof Your Kids: the Complete Guide to Protecting (without Overprotecting) Your Family from Infections" Washington, DC: ASM Press.

Section 2: Why is it important to clean in ECE?

Committee to Review and Assess the Health and Productivity Benefits of Green Schools, National Research Council, (2006) "Green Schools: Attributes for Health and Learning"

Section 3: What are the health hazards of cleaners, sanitizers, and disinfectants?

American Lung Association, "Cleaning Supplies and Household Chemicals" <http://www.lung.org/healthy-air/home/resources/cleaning-supplies.html>

American Lung Association, "ASTHMA – FRIENDLY CHILD CARE: A Checklist for Parents and Providers" <http://www.lung.org/associations/charters/midland-states/program-information/asthma/caare/indoor-air-quality-checklist.pdf>

California EPA/Air Resources Board (CARB), (2012) "Air pollution and contaminants at child-care and preschool facilities in California" http://www.arb.ca.gov/html/fact_sheets/preschool_exposure.pdf

CARB, "Cleaning Products and Indoor Air Quality" http://www.arb.ca.gov/research/indoor/cleaning_products_fact_sheet-10-2008.pdf

Environmental Working Group, "Cleaning Supplies and Your Health" http://www.ewg.org/guides/cleaners/content/cleaners_and_health

California Work-Related Asthma Prevention Program, (2012) "Cleaning products and work-related asthma: Information for workers" available also in Chinese and Spanish, online at <http://www.cdph.ca.gov/programs/ohsep/Pages/AsthmaPubs.aspx#factsheets>

EPA, "Health Effects of Ozone in the General Population" <http://www.epa.gov/apti/ozonehealth/population.html>

Green Facts, "Effects of biocides on antibiotic resistance" <http://copublications.greenfacts.org/en/biocides-antibiotic-resistance/index.htm>

OSHA-NIOSH Info Sheet: Protecting Workers Who Use Cleaning Chemicals <http://www.cdc.gov/niosh/docs/2012-126/pdfs/2012-126.pdf>

San Francisco Asthma Task Force, "2013 Update: Bleach-free Disinfection and Sanitizing for Child Care" <http://www.sfgov3.org/modules/showdocument.aspx?documentid=3822>

Section 4: Effects of cleaning, sanitizing, and disinfecting products on the environment

Beyond Pesticides, "The Ubiquitous Triclosan: A common antibacterial agent exposed" <http://www.beyondpesticides.org/pesticides/factsheets/Triclosan%20cited.pdf>

Section 5: What is the difference between cleaning, sanitizing, and disinfecting and how do these tasks help control infectious disease in ECE?

CDC, "How to Clean and Disinfect Schools to Help Slow the Spread of Flu" <http://www.cdc.gov/flu/school/cleaning.htm>

CDC, "Environmental Cleaning and Disinfecting for MRSA" <http://www.cdc.gov/mrsa/environment/index.html>

Fight BAC, a website designed to teach children and parents about bacteria and how to minimize contact with it. The site gives information to parents about minimizing the growth of bacteria around the home by adopting smart practices during food prep. <http://fightbac.org>

Section 6: Personal practices for reducing the spread of infectious disease in ECE

CDC, "Influenza (Flu) Fact Sheet: Respiratory Hygiene/Cough Etiquette in Healthcare Settings" <http://www.cdc.gov/flu/professionals/pdf/fresphygiene.pdf>

CDC, "CDC Recommendations for the Amount of Time Persons with Influenza-Like Illness Should be Away from Others" <http://www.cdc.gov/hlnlflu/guidance/exclusion.htm>

CDC, "Technical Report for State and Local Public Health Officials and School Administrators on CDC Guidance for School (K-12) Responses to Influenza during the 2009-2010 School Year." <http://www.cdc.gov/hlnlflu/schools/technicalreport.htm>

EPA, "Guide to Air Cleaners in the Home" <http://www.epa.gov/iaqpubs/airclean.html>

Section 7: Choosing safer products for cleaning, sanitizing, and disinfecting

Design for the Environment – list of products available at: <http://www.epa.gov/dfe/products>

EcoLogo – list of products available at: http://www.ecologo.org/en/certifiedgreenproducts/?category_id=21#21

Environmental Working Group – information on what's in specific cleaning products. Available at: www.ewg.org/guides/cleaners

GoodGuide's Household Chemicals Guide [http://www.goodguide.com/products?category_id=176856-household chemicals&sort_order=DESC](http://www.goodguide.com/products?category_id=176856-household%20chemicals&sort_order=DESC)

Grassroots Environmental Education – The ChildSafe Cleaning Product List. <http://www.grassrootsinfo.org/cslist10-11.html>

GREENGUARD Product Guide <http://www.greenguard.org/en/QuickSearch.aspx>

Green Seal - list of products available at: <http://www.greenseal.org/FindGreenSealProductsAndServices.aspx>

Rose, L, Westinghouse, C, and the National Cleaning for Healthy Schools and Infection Control Workgroup, (2010) "Cleaning for healthy schools and infection control handbook" <http://www.informedgreensolutions.org/?q=publications/school-disinfection-handbook>

San Francisco Approved List: Products that meet San Francisco's Health and Environmental Requirements <http://www.sfapproved.org/>

Transpare, an easy to use web-based tool that allows you to compare institutional cleaning products based on their environmental, health, and safety characteristics. Transpare allows purchasers to see what makes a product green and how green it is and to find products that meet their facility occupants' specific needs. It complements the existing third party certification process by providing a way to further compare green products based on credible and verified data.. www.transpare.com

Women's Voices for the Earth – Information on what is in specific cleaning products and recipes for making less-toxic cleaners <http://www.womensvoices.org/protect-yourhealth/cleaning-products/>

Section 8: Clean isn't a smell!

Potera, C. "Scented Products Emit a Bouquet of VOCs," Environmental Health Perspectives <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3018511/pdf/ehp-119-a16.pdf>

Sarantis, H, Naidenko OV, Gray S, et al, (2010) "Not so sexy: The health risks of secret chemicals in fragrance." Breast Cancer Fund, Commonweal and Environmental Working Group http://safecosmetics.org/downloads/NotSoSexy_report_May2010.pdf

Section 9: What are the most effective and safest ways of cleaning, sanitizing, and disinfecting in ECE?

Alabama Department of Health Cleaning Procedures <http://www.jcdh.org/misc/ViewBLOB.aspx?BLOBId=203>

American Academy of Pediatrics, American Public Health Association, National Resource Center for Health and Safety in Child Care and Early Education. 2011. *Caring for our children: National health and safety performance standards; Guidelines for early care and education programs, 3rd edition*. Elk Grove Village, IL: American Academy of Pediatrics; Washington, DC: American Public Health Association. Also available at <http://nrckids.org>

- Appendix J. Selecting an Appropriate Sanitizer or Disinfectant - <http://nrckids.org/CFOC3/HTMLVersion/AppendixJ.pdf>
- Appendix K. Guide for Cleaning Sanitizing and Disinfecting http://nrckids.org/CFOC3/PDFVersion/PDF_Color/CFOC3_K.pdf
- Appendix L. Cleaning Up Body Fluids – <http://nrckids.org/CFOC3/HTMLVersion/AppendixL.pdf>

CDC, "Seasonal Flu Information for Schools & Childcare Providers" <http://www.cdc.gov/flu/school/index.htm>

Hennepin County Human Services and Public Health Department, "Cleaning, Sanitizing, and Disinfection" http://hennepin.us/files/HennepinUS/HSPHD/Public%20Health%20Protection/Epidemiology/Daycare%20Manual/1085_s2aclean.pdf

The National Food Service Management Institute (NFSMI), "Hazard Analysis Critical Control Point – Based Standard Operating Procedures" <http://sop.nfsmi.org/>

Section 10: What is a Hazard Communication Program?

OSHA, "Fact Sheet: December 1st, 2013 Training Requirements for the Revised Hazard Communication Standard" <http://www.osha.gov/Publications/OSHA3642.pdf>

OSHA, "Brief: Hazard Communication Standard: Labels and Pictograms" <http://www.osha.gov/Publications/OSHA3636.pdf>

OSHA, "Quick Card: Hazard Communication Safety Data Sheets"

http://www.osha.gov/Publications/HazComm_QuickCard_SafetyData.html

Section 11: What is the most effective and safest way to clean body fluids and blood spills in ECE?

OSHA, "Fact Sheet: OSHA's Bloodborne Pathogens Standard"

http://www.osha.gov/OshDoc/data_BloodborneFacts/bbfact01.pdf

State of California Health and Human Services Agency, Department of Social Services, Community Care Licensing, "INFORMATION RELEASE NO. 2009-03: STANDARD PRECAUTIONS"

<http://www.cclcd.ca.gov/res/pdf/IR200903.pdf>

General resources

Ashkin, S., "The Science Behind Green Cleaning"

<http://www.facilitiesnet.com/green/article/The-Benefits-of-Green-Cleaning--10793>

Boise, P. "Go Green Rating Scale for Early Childhood Settings Handbook" and "Go Green Rating Scale for Early Childhood Settings," St. Paul, MN: Redleaf Press. The *Go Green Rating Scale Handbook* explains the science and research behind each item in the rating scale and provides support to help you make the proper changes to create and maintain an environmentally healthy and safe ECE setting.

<http://www.gogreenratingscale.org/index.html>

Canadian Partnership for Children's Health and Environment, (2005) "Child Health and the Environment – A Primer"

<http://www.healthyenvironmentforkids.ca/sites/healthyenvironmentforkids.ca/files/cpche-resources/Primer.pdf>

CDC's app, Solve the Outbreak, is an engaging, fun way to learn about diseases and outbreaks, see how disease detectives save lives around the world, and lets you try your hand at solving an outbreak.

<http://www.cdc.gov/features/solvethetheoutbreak/>

Children's Environmental Health Network/Eco Healthy Child Care www.cehn.org/ehcc

Council on Environmental Health, "Chemical-Management Policy: Prioritizing Children's Health"

<http://pediatrics.aappublications.org/content/127/5/983.full.html>

Environmental Working Group, "Safe Cleaning Tips for Your Home"

<http://www.ewg.org/schoolcleaningsupplies/safecleaningtips>

EPA, "What Are Antimicrobial Pesticides?"

http://www.epa.gov/oppad001/ad_info.htm

EcoLogo <http://www.ecologo.org/en/>

EPA Design for the Environment <http://www.epa.gov/dfe/>

Green Seal <http://www.greenseal.org/>

Green Facts: Facts on Health and the Environment

<http://www.greenfacts.org/glossary/>

GREENGUARD's certification program helps manufacturers create – and helps buyers identify – interior products and materials that have low chemical emissions, improving the quality of the air in which the products are used. GREENGUARD Gold Certification (formerly known as GREENGUARD Children & Schools Certification) offers even stricter certification criteria for low-emitting building materials, furniture, finishes, cleaning products, electronics and consumer products used in environments where children and other sensitive populations spend extended periods of time.

http://www.greenguard.org/en/CertificationPrograms/CertificationPrograms_childrenSchools.aspx

Healthy Schools Campaign www.GreenCleanSchools.org

ISSA—The Worldwide Cleaning Industry Association:

Green Cleaning http://www.issa.com/?id=green_cleaning1

This site offers a wealth of information on green cleaning.

SF Asthma Task Force, "Bleach Free Child Care"

http://www.youtube.com/watch?v=_Po46FJY0nc

SF Asthma Task Force, "California Child Care Licensing Regulations for Sanitizing and Disinfecting"

<http://www.sfgov3.org/modules/showdocument.aspx?documentid=2077>

SF Asthma Task Force, "Child Care Center Toolkit, English"

<http://www.sfgov3.org/Modules/ShowDocument.aspx?documentID=3823>

SF Asthma Task Force: Family Child Care Toolkit,

Trilingual <http://www.sfgov3.org/Modules/ShowDocument.aspx?documentID=3826>

Tools for Schools Ventilation Checklist

<http://www.epa.gov/iaq/schools/pdfs/kitlchecklists/ventchk1st.pdf>

The Toxics Use Reduction Institute's Retail Cleaning Product Testing & Evaluations http://www.greencleaninglab.com/retail_cleaning_producttesting.php

Appendix A

Model Green Cleaning, Sanitizing, and Disinfection Policy for ECE programs

Program Name _____ Date _____

Chemicals that are commonly used for cleaning, sanitizing, and disinfecting and maintaining buildings can affect human health as well as the environment. Many such products contain ingredients that may

- ◆ result in eye, skin or respiratory irritation and chemical burns;
- ◆ cause or trigger asthma;
- ◆ cause cancer, or harm a fetus in the womb;
- ◆ be endocrine disruptors;
- ◆ affect the developing brain and nervous system.

Children are more vulnerable than adults to the health effects from exposure to hazardous chemicals for several reasons. They take in more food, water, and air for their weight and size than adults. Their behaviors also put them at risk: mouthing objects and crawling on the floor may bring them into closer contact with toxic chemicals. Their bodies are also less able to process and get rid of toxics.

Exposure to these chemicals also has serious public health impacts for ECE staff and building occupants. Custodial workers experience one of the highest rates of occupational asthma, twice the rate of other workers.

Policy

Center name _____

will purchase less hazardous cleaning, sanitizing, and disinfecting products and devices in order to improve indoor air quality, enhance and protect human and environmental health, foster a more productive learning environment, and reduce liability.

Additionally, we will implement and practice green cleaning, sanitizing, and disinfecting procedures to manage and clean our ECE facility and to minimize exposure to toxic chemicals

related to building contaminants and cleaning products. The components of this policy includes the following:

◆ Provide parents, staff, and outside cleaning contractors with:

1. a list of approved cleaning, sanitizing, and disinfecting products and work practice procedures to be used in the facility;
2. procedures for safe and appropriate product dilution (if concentrates are used);
3. techniques to mitigate hazards (e.g. ventilation, dilution station, etc.).

◆ Provide parents and staff with print and online resources on green cleaning, sanitizing, and disinfecting.

◆ Designate a *Green Cleaning Coordinator* for our facility who will be trained in green cleaning, sanitizing, and disinfecting policies and practices and the prevention of infectious disease, and will act as a resource to our staff and families.

◆ Train employees to properly and safely use chemicals when they are hired and annually thereafter, or sooner if new products are introduced in the facility.

◆ Review the facility periodically using the *Green Cleaning, Sanitizing, and Disinfecting Checklist*.

◆ Post warning signs in areas where cleaning products are locked and stored out of reach of children.

◆ Ventilate the area as much as possible while cleaning to minimize exposure.

◆ Provide personal protective equipment for our employees to use when it is necessary.

◆ Keep records. Safety Data Sheets or a list of products and when and how they were used must be kept for 30 years as required by the Hazard Communication Program. Training records must also be kept. (See Section 10: *What is a Hazard Communication Program?*)

- ◆ **Label cleaning products.** Secondary containers of diluted cleaning products without the original label must be labeled according to requirements of the OSHA Hazard Communication Standard. (See Section 10: *What is a Hazard Communication Program?*)
- ◆ **Develop a procedure for the use of cleaning cloths.** Whenever possible, we will use microfiber. When we use microfiber, we will color code the cloths and mops to minimize transferring germs from one part of the facility to another.
- ◆ **Avoid known hazardous chemicals when purchasing cleaning products.** We will seek to purchase products certified by a third-party, for example, those certified by Green Seal, EcoLogo, and Design for the Environment. If these are not available, we will avoid products that
 - ◆ are aerosols;
 - ◆ contain the chemicals listed on page 29.

Infectious diseases

There are many things to consider when working to reduce the transmission of infectious disease in child care settings. Children in ECE are at higher risk for infectious diseases because they have immature personal hygiene habits and they commonly engage in hand-to-mouth activities. Their immune systems are less developed, so they are more susceptible to becoming sick when exposed to disease. This policy strives to prevent the transmission of disease through the use of the least hazardous means possible.

To minimize exposure to infectious disease and hazardous cleaning, sanitizing, and disinfecting products, it is our policy that we will:

1. Follow the *Caring for Our Children: National Health and Safety Performance Standards' Appendix K Schedule for Cleaning, Sanitizing, and Disinfecting* listed in Appendix D of the *Green Cleaning, Sanitizing, and Disinfecting Toolkit for ECE*.
2. Train providers in our facility in accordance with the curriculum contained in the *Green Cleaning, Sanitizing, and Disinfecting Toolkit for ECE*.
3. Schedule periodic inspections of our facility using the *Green Cleaning, Sanitizing, and Disinfecting Checklist*.
4. Consult the U.S. Centers for Disease Control and Prevention website for instructions on implementing additional preventive actions to reduce infectious disease if an outbreak of a serious infectious disease occurs.
5. Purchase least-hazardous sanitizers, disinfectants, and hand hygiene products as described in Section 7 of the *Green Cleaning, Sanitizing, and Disinfecting Toolkit Curriculum*.

Appendix B

Tips on Forming a Buying Cooperative

Many of the newer and less harmful cleaning, sanitizing, and disinfecting products on the market are only available through distributors. Distributors buy in quantity from several manufacturers and warehouse the goods for sale. School districts and large institutions purchase their products through distributors because they can buy in volume and it costs less. Small ECE programs can also purchase products and equipment from distributors by forming buying cooperatives.

Buying cooperatives are formed when groups join together with others for joint purchasing. A cooperative, or co-op, buys and sells products or services like any other business. The difference is a co-op is owned and governed by its members, the people who use it. They get access to better products and cheaper prices. Buying cooperatives are especially helpful for ECE programs in rural areas, where costs can be higher, than in urban areas where there is more competition among retailers, and delivery costs are lower. Other benefits of forming a buying cooperative and purchasing from a distributor are:

- ◆ you often get access to a better selection of better quality, safer products, including newer products that may not be available at local retail stores;
- ◆ dilution stations are often provided for free when enough of a product is purchased;
- ◆ Safety Data Sheets and pre-printed labels for secondary containers, required for your Hazard Communication Program, are provided;
- ◆ distributors often provide better service on delivery and exchanges;
- ◆ buying cooperative members can share experiences with products and provide advice to each other;

- ◆ other products, like food and cleaning services, can be added to the cooperative buying program, extending the cost savings.

Forming a buying cooperative

- ◆ Before making plans to organize your own purchasing cooperative, find out if any other cooperatives are available to you. Speak to the school district in your area. Can you join with it to make purchases?
- ◆ Find other ECE programs who are interested in forming a cooperative.
- ◆ Contact the National Cooperative Business Association (NCBA). NCBA helps develop cooperative businesses across the United States through partnerships with CooperationWorks! – a network of rural co-op development centers – and the Urban Cooperative Development Initiative.

Resources:

USDA, A Guide for the Development of Purchasing Cooperatives

<http://www.rurdev.usda.gov/rbs/pub/cir64.pdf>

National Cooperative Business Association (NCBA)

<http://www.ncba.coop/>

<http://www.cooperationworks.coop/>

Appendix C

How to Hire a Cleaning Service

A cleaning service (CS) should clean, sanitize, and disinfect your ECE environment in a safe, effective manner, using third-party certified, least hazardous cleaning, sanitizing, and disinfecting products. A CS must purchase the right products, but they must also know how, where, and when to use them. A knowledgeable CS can also help you create your own green cleaning program. Here are some guidelines that will help you select a CS:

1. Identify a CS with ECE facility experience.

- Ask other ECE providers for the names of CSs that are familiar with cleaning, sanitizing, and disinfecting products and practices that protect human health and the environment
- Ask applicant CSs if they have experience working in ECE; do they know the state child care licensing regulations; and are they registered and insured?

2. Ask the CSs if they are certified.

- Are they a certified green CS; if so, by whom, and what is the certification process?

3. Ask what products they use.

- Are they using cleaning products that are certified by Green Seal, EcoLogo, or Design for the Environment to be free from carcinogens, reproductive toxins, neurotoxins, fragrances, and other ingredients which can cause health problems?

4. Find out what equipment they use.

- Are they using “greener” equipment such as HEPA or high-filtration vacuums, buffers and burnishers with a vacuum attachment, and color-coded microfiber cloths and mops?

5. Ensure that disinfectants used by the CS are

- registered with the EPA as a hard-surface hospital-grade disinfectant and preferably approved by the EPA’s Design for the Environment Antimicrobial Pesticide Pilot Project. The EPA is the only agency that can legally identify disinfecting products that are safer for human health and the environment.

6. Confirm the CS uses a two-step process (cleaning, then sanitizing or disinfecting)

- Make sure the CS understands which areas require sanitizing vs. disinfection, and when permission is required for use of more hazardous chemicals (i.e. application of cleaning materials that run a risk of inhalation hazard).

7. Does the service provide training to its employees? If so, does it cover:

- Hazard Communications;
- proper use of products;
- bloodborne pathogens?

8. Some ways to know your CS is not using a green cleaning program. The cleaning service

- uses products such as Pine-Sol™, aerosolized cleaners, scented products, and bleach;
 - does not use microfiber cloths and mops or a split-bucket system;
 - does not ventilate areas during and after cleaning;
 - uses the same cleaning equipment in multiple areas without cleaning or switching out heads/cloths/etc.
 - does not include recommendations for safer, green-certified cleaning supplies.
-

Appendix D

What, Where and How Often to Clean, Sanitize, and Disinfect in ECE

Areas	Before Each Use	After Each Use	Daily <i>At the End of the Day</i>	Weekly	Monthly	Comments
FOOD AREAS						
Food preparation surfaces	Clean, Sanitize	Clean, Sanitize				Use a sanitizer safe for food contact
Eating utensils & dishes		Clean, Sanitize				If washing the dishes and utensils by hand, use a sanitizer safe for food contact as the final step in the process; Use of an automated dishwasher will sanitize
Tables & high chair trays	Clean, Sanitize	Clean, Sanitize				
Countertops		Clean	Clean, Sanitize			Use a sanitizer safe for food contact
Food preparation appliances		Clean	Clean, Sanitize			
Mixed-use tables	Clean, Sanitize					Before serving food
Refrigerator					Clean	
CHILD CARE AREAS						
Plastic mouthed toys		Clean	Clean, Sanitize			
Pacifiers		Clean	Clean, Sanitize			Reserve for use by only 1 child; use dishwasher or boil for one minute
Hats			Clean			Clean after each use if head lice are present
Door & cabinet handles			Clean, Disinfect			
Floors			Clean			Sweep or vacuum, then damp mop, (consider microfiber damp mop to pick up most particles)
Machine-washable cloth toys				Clean		Laundry
Dress-up clothes				Clean		Laundry
Play activity centers				Clean		
Drinking fountains			Clean, Disinfect			

Areas	Before Each Use	After Each Use	Daily <i>At the End of the Day</i>	Weekly	Monthly	Comments
CHILD CARE AREAS						
Computer keyboards		Clean, Sanitize				Use sanitizing wipes, do not use spray
Phone receivers			Clean			
TOILET AND DIAPERING AREAS						
Changing tables		Clean, Disinfect				Clean with detergent, rinse, disinfect
Potty chairs		Clean, Disinfect				
Handwashing sinks & faucets			Clean, Disinfect			
Countertops			Clean, Disinfect			
Toilets			Clean, Disinfect			
Diaper pails			Clean, Disinfect			
Floors			Clean, Disinfect			Damp mop with a floor cleaner/ disinfectant
SLEEPING AREAS						
Bed sheets & pillow cases				Clean		Clean before use by another child
Cribs, cots, & mats				Clean		Clean before use by another child
Blankets					Clean	

Source: American Academy of Pediatrics, American Public Health Association, National Resource Center for Health and Safety in Child Care and Early Education. 2011. *Caring for our children: National health and safety performance standards; Guidelines for early care and education programs, Appendix K. 3rd edition*. Elk Grove Village, IL: American Academy of Pediatrics; Washington, DC: American Public Health Association. Also available at <http://nrckids.org>.

Appendix E

Model Center Hazardous Communication Program Policy

General Information

In order to comply with OSHA 1910.1200, Hazard Communication Standard, the following written Hazard Communication Program has been established for _____

Name of ECE Program

The written program will be available at the Director's office for review by any interested employee.

1. Container Labeling

Name

shall verify that all incoming containers received for use are clearly labeled to indicate:

- the identity of the contents (the identity must match the corresponding Safety Data Sheet);
- appropriate hazard warnings (including routes of entry and target organs);
- the name and address of the manufacturer, importer, or responsible party.

The supervisor of each area will ensure that all secondary containers (those containers other than the original) will be labeled with:

1. the identity of the contents (the identity must match the corresponding SDS);
2. appropriate hazard warnings (including routes of entry and target organs).

2. Safety Data Sheets (SDSs)

The Director will be responsible for obtaining and maintaining Safety Data Sheets for the facility. It is the policy for this facility that when toxic or hazardous substances are received without an SDS, or the appropriate SDS is not on file, the chemical will not be accepted until such information is available.

Name

will review incoming SDSs for new and significant health/safety information. They will see that any new information is passed on to the affected

employees. If an SDS is incomplete, a new SDS will be requested from the manufacturer/supplier by

Name

SDSs shall be available to each employee during his/her work shift. To obtain a copy of the SDS, request one from the Director.

3. Employee Training and Information

Name

is responsible for the employee training program. S/he will ensure that all elements specified below are carried out.

Prior to starting work, each new employee will attend a health and safety orientation and will receive information and training on the following:

- a. An overview of the requirements contained in the OSHA Hazard Communication Standard, 1910.1200
- b. Any operations in their work area where hazardous chemicals are present
- c. Location and availability of our written hazard program
- d. Physical and health hazards of the chemicals in their work area
- e. Methods and observation techniques used to determine the presence or release of toxic and hazardous substances in the work area
- f. Measures employees can take to protect themselves from hazards in their workplace, including specific procedures the employer has implemented to prevent exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment
- g. Explanation of the labeling system and what the label information means,
- h. Explanation of SDSs and how employees can use this information to protect themselves.

Prior to a new chemical hazard being introduced into any section of this facility, each employee in that section will be given information as outlined above.

4. List of Hazardous Chemicals

The following is a list of all known toxic and hazardous substances used at the Center. Further information on each listed substance can be obtained by reviewing the appropriate Safety Data Sheets.

Identity of Chemical _____

Toxic/Hazardous Substances _____

Work Area and Process _____

5. Hazardous Non-Routine Tasks

Periodically, employees are required to perform hazardous non-routine tasks. Prior to starting work on such projects, each affected employee will be given information by their supervisor about hazardous chemicals to which they may be exposed during such activity. This information will include

- specific hazards;
- protective/safety measures the employee can take;
- measures the program has taken to lessen the hazards including ventilation, respirators, presence of another employee, and emergency procedures.

Non-routine tasks performed by the employees of this program are:

Task _____

Toxic/Hazardous Substances _____

If employees do not understand any aspect of the above information, they should not perform the task. The supervisor should be contacted for additional training.

6. Informing Contractors

It is the responsibility of the Director to provide contractors with the following information:

- Notify contractors of the toxic and hazardous substances to which they may be exposed while on the job site and how the appropriate SDS can be obtained
- Precautionary measures that need to be taken to protect contracted employees during the workplace's normal operating conditions and in foreseeable emergencies
- Explanation of labeling systems used

The Director will also be responsible for contacting each contractor before work is started in the facility to gather and disseminate any information concerning chemical hazards that the contractor is bringing to our workplace.

If anyone has questions or does not understand this plan, contact the Director. The Center's Hazard Communication Program will be monitored by the Director to ensure that the policies are carried out and the plan is effective.

Signature _____

Date _____

Suggested Citation: UCSF Institute for Health & Aging, UC Berkeley Center for Environmental Research and Children's Health, Informed Green Solutions, and California Department of Pesticide Regulation. *Green Cleaning, Sanitizing, and Disinfecting: A Toolkit for Early Care and Education*, University of California, San Francisco School of Nursing: San Francisco, California, 2013.

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The creators of the Green Cleaning Toolkit include health care providers, childcare professionals, and public health professionals.

