
Environmental Health



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California Childcare Health Program

The mission of the California Childcare Health Program is to improve the quality of child care by initiating and strengthening linkages between the health, safety and child care communities and the families they serve.

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LEARNING OBJECTIVES

To describe why young children are uniquely vulnerable to environmental exposures.

To identify the leading environmental health risks for children.

To describe the effects of hazardous exposures on children's health.

To describe actions to reduce environmental health exposures.

To describe three ways a Child Care Health Advocate (CCHA) can assist early care and education (ECE) programs with appropriately addressing the children's environmental health needs.

To identify the key environmental health resources available to assist and support ECE providers and families.

RATIONALE

Children are uniquely vulnerable to environmental exposures because of their developmental stage and physical size. Lead, air pollution, pesticides and drinking water pollution are the leading environmental hazards for young children in ECE programs. Being exposed to these environmental pollutants is bad for children's health and development. The health effects of these exposures for young children and the ways to prevent their exposures in ECE programs are explained in this module.

INTRODUCTION

Many people are concerned about children being exposed to environmental hazards such as lead and pesticides (Crain, 2000). There are also concerns about possible links between being exposed to environmental toxins and common chemicals, and having diseases such as asthma and cancer (Greater Boston Physicians for Social Responsibility [GBPSR], 2000). The biggest problem is that it is difficult to avoid being exposed to low levels of many chemicals, and scientists do not know a lot about the health risks of these exposures. Added to this is the problem that scientists are often unable to tell which chemicals might be dangerous because people are exposed to so many at the same time. Chemicals in the environment may act *synergistically*, meaning that their combined effect is greater than the sum of the effects of several chemicals. The problem is that for most chemicals, we simply do not know how safe—or dangerous—they may be.

One hundred years ago, the major causes of death and illness in children were infectious diseases: pneumonia, influenza, measles, diphtheria, dysentery and tetanus (Centers for Disease Control and Prevention [CDC], 1999). In 1900, 10% of infants died before their first birthday. By the end of the last century, the rate of infant mortality had declined to less than 1%. Clearly, there have been huge improvements in children's health during this period. Yet while some illnesses have declined greatly over the last century, new health problems have appeared.

Consider these new health problems:

- Asthma rates for children have doubled in the last 15 years (Crain, 2000). In the United States in 2001, 8.7% (6.3 million) of all children had asthma (Environmental Protection Agency [EPA], 2005). According to the *Strategic Plan for Asthma in California* (2002), the rates in California are similar to the national rates. More information on asthma can be found in the *Asthma Information Packet* (CCHP, 2005) (<http://www.ucsfchildcarehealth.org/html/pandr/trainingcurmain.htm#asthma>).
- Childhood cancer rates have increased 10% between 1973 and 1991 (Mott, Fore, Curtis & Solomon, 1997). Since 1999, the National Cancer Institute reported that this increase in childhood cancers leveled off after 1990 (Ries et al., 1999).

- Rates of infants born with low birth weight have risen steadily since the 1980s despite prevention efforts (Pew Environmental Health Commission, 1999). In 2004, in California, 6.6% of newborns were low birth weight. The rate has remained approximately the same from 1997 to 2004 (Perinatal Outcomes Project, 2004).
- Rates of infants born with serious heart defects and urinary tract obstructions have risen 2.5 and 1.5 times respectively in the last decade (Pew Environmental Health Commission, 1999). Heart defects are the most common birth defect in California, with 1.8 cases per 1,000 live births from 1997 to 1999. The rates of birth defects in California generally remained constant during the 1990s (EPA, 2005).
- Rates of hyperactivity, learning disabilities, slowness to learn, autism and disruptive behavior among school-age children have increased largely over the last two decades (GBPSR, 2000).

Environmental factors, such as being exposed to toxic chemicals and pollution, may play an important role in the appearance of these new health problems (Bearer, 1995; Crain, 2000; GBPSR, 2000; Mott et al., 1997). This module will focus on natural and human-made environmental exposures that affect the health of children in ECE programs. Among the hundreds of potential environmental exposures present in today's world, the scientific community tends to agree with Mott et al. (1997) that the five worst risks to the health of young children are the following: *environmental tobacco smoke, lead, air pollution, pesticides and drinking water pollution* (Crain, 2000; Gratz & Boulton, 1993). This module presents information on lead, air pollution, pesticides and water pollution. For each of these risks, this module will present the following:

- the source(s) of the pollutant in ECE programs
- how children are exposed
- health effects for young children of being exposed to the risk
- how to identify the pollutants in ECE programs
- recommended actions for prevention and management

WHAT A CCHA NEEDS TO KNOW

Children’s Unique Vulnerability to Environmental Exposures

Scientists are just beginning to discover how dangerous some environmental exposures are to people’s health, but one thing is clear: children are far more vulnerable to the effects of environmental exposures than adults. Like adults, children take in environmental toxins by swallowing them, inhaling them or getting them on their skin. For example, children swallow pesticide residues (traces of pesticides), mercury or other toxic chemicals in their food or drinking water; they breathe air pollutants such as tobacco smoke, asbestos or lead dust into their lungs; and they absorb chemicals and cleaning solutions through their skin. The main factors influencing the effect of environmental toxins on children’s health are the following:

- amount of the toxin or chemical
- the strength of the toxin itself—concentrated or diluted
- how long the child was exposed to the toxin (i.e., a few minutes or a few months)
- the age, gender and health status of the child who was exposed to the toxin

Young children’s developmental stage and behaviors increase their exposure to environmental toxins in the following ways:

More contact with the ground

Because their bodies and minds are still growing, and because of the type of developmental activities they participate in, infants and young children spend a large amount of time closer to the ground than adults. Before infants can walk, adults often place them on floors or grass to encourage movement and exploration. Once they can crawl, much of young children’s play and activities take place on the floor, carpeting, grass and playground surfaces. As a result, they have more exposure to toxins that are applied to or settle on these surfaces, such as chemicals from carpets, lead-based paint dust, cleaning product residues, fertilizers, herbicides and pesticides.

More time outdoors

Children spend relatively more time outdoors than adults, and the time spent is more likely to be active, which requires deeper breathing. Children also breathe often through their mouths, and this means that chemicals do not get filtered through the nose, but go directly into the lungs. Adults often breathe through the nose and are able to filter out some dust and pollution that way. Children also do their breathing closer to the ground, where more pollutants tend to stay longer. The “breathing zones” of adults are at about 4 to 6 feet above the ground, while a child’s breathing zone is often at the 1- to 2-foot height. All of these characteristics make children more vulnerable to any air pollutants in the environment than adults.

More hand-to-mouth activity

Young children explore the world by putting things in their mouths. This developmentally appropriate behavior increases their chances of eating pollutants in dirt or dust, such as lead-based paint dust and pesticide residues.

Less varied diet

A child’s diet tends to be less varied than that of an adult. For example, the diet of infants is generally limited to breast milk or formula. The average 1-year-old drinks 21 times more apple juice, 11 times more grape juice and nearly five times more orange juice per unit of body weight than the average adult. Infants and children also drink two and a half times more water per unit of body weight daily than adults. If these liquids contain pollutants, children will be exposed to more than adults because the liquids make up a larger proportion of their diet.

Children’s Biological Immaturity Increases Their Health Risk

Children are physically smaller than adults and their metabolic rate is higher. This means that they digest their food quicker than adults do. As a result, children breathe more rapidly and take in more oxygen relative to their size than adults. They also eat more food and water relative to their size than adults. This means that the amount of any pollutants available in air, food or water would be greater in children’s bodies than in

those of adults. Lead, because it is absorbed in place of calcium when it is present, is absorbed to a greater extent in children than in adults. An adult will absorb 10% of swallowed lead, whereas a 1- to 2-year-old child will absorb 50% of swallowed lead (Bearer, 1995).

Because their digestive systems are still developing, children are less capable of fighting off toxic effects than adults. For example, adults may store toxins in fat tissue or get rid of toxins through the digestive

system. Infants are unable to get rid of toxins this way and may be exposed to toxins longer. Also, in adults and children over 6 months of age, there is a blood-brain barrier to protect the brain from potentially toxic chemicals going through the body. In infants, this barrier is not fully developed until 6 months of age. Finally, children's respiratory (breathing) passages are narrower than adults, meaning that air pollution can more easily cause children to have trouble breathing.

TABLE 1: ENVIRONMENTAL HAZARDS FOR CHILDREN AT DIFFERENT STAGES OF DEVELOPMENT

Developmental Stage	Developmental Characteristics	Ways of Being Exposed	Biological Vulnerabilities
Newborn (0 to 2 months)	Cannot crawl or walk. Restricted environment. High calorie/water intake. High air intake. Highly permeable skin. Low stomach acids.	Food Breast milk Infant formula Indoor air Tap/well water	Brain still developing. Neuron synapses being created. Lungs still developing. Bones growing and hardening.
Infant/Toddler (2 months to 2 years)	Beginning to walk. Puts toys and objects in mouth. Restricted environment. Increased time away from parents. Low variation in diet. Increased outdoor time.	Food Breast milk Infant formula Baby food Milk/milk products Indoor and outdoor air Tap/well water in home and child care facility Surfaces Rugs Floors Lawns	Brain still developing. Lungs still developing.
Preschool Child (2 to 6 years)	Learning language. Group and individual play. Growing independence. Increased intake of fruits and vegetables. Active outdoor play.	Food Fruits, vegetables Milk/milk products Air ECE programs Outdoor Water Tap/well Water fountains	Brain still developing. Lung volume is increasing.

Adapted from Bearer (1995).

Throughout early childhood, there are *sensitive periods* of rapid development. This means that there are short time periods in which a lot of growth is happening in the organs. If children are exposed to environmental hazards during sensitive periods of rapid organ development, the structure and function of that organ may be permanently changed. In adults, organ growth has completed. During infancy and early childhood, however, there is rapid organ development. For example, animal tests of pesticides show that even small, single doses of pesticides during a critical 24-hour period of brain development can cause hyperactivity and permanent changes in the brain (GBPSR, 2000). Bearer (1995) summarizes the environmental hazards for children at different stages of development in Table 1.

Environmental Health Hazards

There are many hazards that are specific to young children in ECE programs. This next section covers the most common ones and what to do about them. Children are exposed to environmental toxins everyday. Some hazards, such as being exposed to tobacco smoke, are understood. Other hazards, such as being exposed to a small amount of many chemicals for a long period of time, are more complex and difficult to understand.

Some chemicals are regulated by the EPA. These regulations, however, are specific to one chemical at a time. In reality, children are often exposed to many chemicals at the same time. Being exposed to many chemicals often worsens damaging effects or causes new types of harm.

ENVIRONMENTAL TOBACCO SMOKE

Children who are exposed to environmental tobacco smoke, also known as secondhand smoke, are at increased risk for a number of adverse health effects, including lower respiratory tract infections, bronchitis, pneumonia, fluid in the middle ear, asthma symptoms and Sudden Infant Death Syndrome (SIDS). Exposure to environmental tobacco smoke also may be a risk factor contributing to the development of new cases of asthma. Young children appear to be more susceptible to the effects of environmental tobacco smoke than older children are. In the United States, the percentage of homes with children under 7 in which

someone smokes on a regular basis decreased from 29% in 1994 to 19% in 1999 (EPA, 2005).

Since it is required by the Community Care Licensing Division (State of California, 2002) and the National standards (American Academy of Pediatrics [AAP], American Public Health Association & National Resource Center for Health and Safety in Child Care, 2002) that there be *no smoking* in ECE programs, environmental tobacco smoke will not be covered in this module. For more information on smoking cessation programs, call (800) NO BUTTS. See *Handout: No Smoking Poster*. The National standards state the following:

STANDARD 3.041 Tobacco Use and Prohibited Substances: Tobacco use, alcohol and illegal drugs shall be prohibited on the premises of the facility at all times.

RATIONALE: Scientific evidence has linked respiratory health risks to secondhand smoke. No children, especially those with respiratory problems, should be exposed to additional risk from the air they breathe. Infants and young children exposed to secondhand smoke are at risk of developing bronchitis, pneumonia and middle ear infections when they experience common respiratory infections. Separation of smokers and nonsmokers within the same air space does not eliminate or minimize exposure of nonsmokers to secondhand smoke (AAP et al., 2002).

LEAD

Children with high levels of lead in their blood have lower IQ scores, more language difficulties, more attention problems and more behavior disorders than children with normal levels. Due to these links between lead and children's health, lead was removed from two major sources: gasoline in the mid-1970s and house paint in 1978. Despite these actions, lead continues to be a major environmental health problem for America's children. See *Handout: Health and Safety Notes: Lead in Keys* and *Handout: Health and Safety Notes: Anemia, Lead Poisoning and Child Care*.

Sources of lead in ECE programs

Lead is a very toxic metal found in common everyday items such as paint and soil. Because it does not break down, lead stays in the environment. Pre-1978 paint

products are still largely responsible for the continuing high concentrations of lead found in buildings and in the soil around buildings built before that time.

Lead paint. The U.S. Department of Housing and Urban Development (HUD) (1995) estimates that 75% of U.S. homes built before 1980 contain some lead-based paint, and the older the home, the greater the likelihood. Lead was a major ingredient in house paint before 1950, when some paint contained as much as 50% lead. *Lead paint is still the most common health problem for children.*

Lead paint that is intact, encapsulated (painted over with paints specifically made to cover lead-based paints), enclosed (covered with a non-lead surface such as vinyl siding) or otherwise completely covered with non-lead-based paint or another non-lead surface does not pose a health problem as long as the paint is well maintained and surfaces are kept clean.

The most common cause of lead poisoning in children is through eating lead dust by normal hand-to-mouth activity. If lead-based paint falls apart over time due to moisture, normal use or disturbance during renovation projects, flakes or chips of paint break apart and their dust is so small it cannot be seen with normal vision. Also, chips or flakes of lead paint themselves are attractive to young children because they taste sweet, like candy. Children cared for in older houses with peeling lead paint are considered at highest risk for lead exposure, followed by children whose parents are remodeling houses built before 1978.

The full extent of lead hazards in ECE programs has not been looked at by U.S. environmental agencies, but it is possible that ECE programs housed in buildings built before 1978, and especially those built before 1950, are likely to have lead paint in them. If the buildings are well cared for and the paint is not peeling, the lead paint may not cause a problem. But if the building is not well cared for and there is peeling paint, the children in the ECE program may be exposed to lead.

Secondary sources of lead. There are other ways that children may be exposed to lead in ECE programs:

- drinking water that may have lead in it from lead-containing pipes in the facility plumbing

- older and imported toys (especially those from developing countries)
- arts and crafts materials
- old pottery (especially imported pottery) and pewter
- imported vinyl mini blinds
- older outdoor playground equipment coated with lead-based paint
- lead in the air from nearby industries that produce lead-containing materials (e.g., factories that melt and refine metals)

How are children exposed to lead?

Children are exposed to lead mainly through hand-to-mouth activity. As they put their fingers or other objects in their mouths, they unintentionally swallow lead particles from the dust, paint, water or soil. As mentioned earlier, they may be especially attracted to lead dust because of its sweet taste. They may also breathe air that has lead in it.

What are the health effects of being exposed to lead?

Lead poisoning affects every system in the body. Even at very low levels, it can affect a child's brain and central nervous system, kidneys and reproductive system. At higher levels, it can cause coma, convulsions and death. Low levels of lead are linked with lower IQ scores, impaired neurobehavioral development (development related to the connection between the nervous system and behavior), decreased size and growth, and impaired hearing. Lead effects are permanent and continue to affect a child's functioning throughout life. Except at very high levels, lead poisoning usually *shows no obvious symptoms*. It can only be confirmed through direct blood testing (AAP, 2003; AAP et al., 2002). For this reason, the AAP (2003) recommends that children who have certain risk factors be tested for high levels of lead in the blood. The following groups of children are recommended for testing:

- children in the first and second year of life who live in housing built before 1950
- children living in poverty
- children with developmental delays whose oral behaviors put them at risk
- victims of abuse and neglect

- children whose parents are exposed to lead
- immigrant children, including children who are adopted from foreign countries
- children who live in or regularly visit a house built before 1978 that is being or has been remodeled within the last 6 months
- children who have a sibling or playmate who has or did have lead poisoning

How to identify lead hazards in ECE programs

Accurate detection of lead hazards *requires* professional expertise. Do-it-yourself spot test kits are available at home retail centers and paint stores, but the tests are not always sensitive enough. The EPA and HUD (1995) do not recommend the current chemical spot test products. To find a certified professional for lead testing, contact your state or local health department, or visit the Web site of the California Childhood Lead Poisoning Prevention Branch at <http://www.dhs.ca.gov/childlead/html/POclpppC.html#clpppC>. This site lists lead evaluation service providers and lead risk control service providers by county.

Actions to prevent and manage being exposed to lead in ECE programs

The risk of being exposed to lead in ECE programs cannot be entirely eliminated, but it can be largely reduced. The following list summarizes actions recommended for managing and preventing exposure to lead. The recommendations are adapted from AAP et al. (2002), CDC (2002), AAP (2003), National Center for Healthy Housing (2001) and HUD (1995, 1999).

- **Test soil.** If the facility was built before 1978, the paint likely contains lead. Have the facility and surrounding soil tested for lead by a certified professional.
- **Remove or encapsulate paint.** The National standards (AAP et al., 2002) state that paint that contains lead levels of 0.06% and above and that is on a surface that children can easily reach should be removed, or the surface should be made off limits to children, regardless of the condition of the surface. If the paint cannot be removed entirely, it can be encapsulated by painting over it with paints specifically made to cover lead-based paints. Lead paint may be enclosed by covering it with a non-lead surface, such as vinyl siding. Enclosure does not remove

the lead hazard, but generates very little lead dust. These procedures should be carried out by a certified professional.

- **Replace window treatments.** Replace any vinyl mini blinds that may contain lead with new ones that do not contain lead, or use alternative window treatments.
- **Keep the ECE program clean.** Even if there is no lead paint or other lead source in the facility, dust and dirt containing lead can be easily tracked in from the outside. Install a good doormat and keep it clean.
- **Wash hands.** Frequently washing children's hands (especially before eating, before naptime and after playing outdoors) and washing toys that children often put in their mouths will reduce the swallowing of lead.

AIR POLLUTION

Air pollution affects children more than adults because children have narrower airways, they breathe more rapidly and they breathe in more pollutants per pound of body weight than adults (AAP, 2003). See Table 2 for the sources of indoor and outdoor air pollution in ECE programs (National Training Institute for Child Care Health Consultants, 2004).

California has taken important steps to protect children from environmental pollutants with unprecedented funding to support cleanups of hazardous substances at school sites, to evaluate air quality in portable classrooms and to ensure that environmental standards safeguard infants, children and other sensitive people. The California Environmental Protection Agency (Cal/EPA) and its boards, departments and office are implementing these programs under several laws, including the Children's Environmental Health Protection Act of 1999 and the Governor's Children's Environmental Health Initiative. Together these programs address growing concerns and issues about protecting children's health, particularly from potential exposures in the school environment.

Sources of air pollution in ECE programs

Outdoor air. Outdoor air quality is influenced by chemicals and particles from sources such as factories, power plants, dry cleaners, cars, buses, trucks, agricultural activities and even windblown dust. The

TABLE 2: SOURCES OF INDOOR AND OUTDOOR AIR POLLUTION IN ECE PROGRAMS

Pollutant	Description	Sources
Environmental tobacco smoke	The mixture of smoke given off by the burning end of a cigarette, pipe or cigar, and the smoke that is breathed out by the smoker.	Cigarette, pipe and cigar smoke.
Radon	A radioactive, colorless and odorless gas that is naturally produced by the decay of uranium.	Earth and rock beneath buildings, well water and building materials. Radon is more common in mountainous and rocky regions. It seeps into buildings from the soil beneath and is usually found in highest concentrations in basements.
Biological pollutants	Mold, dust mites, pet dander (i.e., skin flakes), cockroaches, rodents, and other pests or insects.	Found most often in areas linked with food, moisture or water (e.g., kitchens, humidifiers, unvented bathrooms), and collected dust (e.g., draperies, bedding, carpet).
Combustion by-products	Gases (e.g., carbon monoxide, nitrogen oxides, sulfur dioxide) and particles generated from burning materials.	Gas or wood ranges, stoves, furnaces and space heaters that are not vented to the outside; auto, truck or bus exhaust from attached garages; nearby roads, factories and power plants; and idling vehicles in parking areas.
Volatile organic compounds (VOCs)	Liquids or solid chemicals that contain carbon and turn to gas at normal room temperatures.	Gasoline, household cleaning products (e.g., rug and oven cleaners), air fresheners, adhesives, paints and lacquers, paint strippers, dry-cleaning fluids, building insulation, pressed wood products used in building and furniture construction, and graphics and craft supplies such as glues and permanent markers.
Particulate matter	Smoke, soot and dust particles suspended in the air. Dust particles may contain lead, pesticide residues, asbestos or other toxic materials. When inhaled, these fibers are often small enough to be breathed deep into the lungs, where they can attach to the airways and build up.	Soil, fleecy surfaces, pollen, lead-based paint, burning wood, oil, coal, automobile exhaust, and dust and smoke from factories.

From: National Training Institute for Child Care Health Consultants, 2004

closer the ECE program is to industrial or agricultural sites or highways, the higher the risks of outdoor air pollution.

Indoor air. The EPA and the U.S. Consumer Product Safety Commission (1995) warn that air in homes and other buildings is often more seriously polluted than outdoor air, even in the largest industrialized cities. This information, along with the fact that children spend as much as 90% of their time indoors, means that children's exposure to indoor air pollutants may be two to five times higher, and sometimes 100 times higher, than their exposure to outdoor air pollutants (U.S. Department of Health and Human Services, 2000; EPA, 2005). See *Handout: Health and Safety Notes: Indoor Air Quality*.

What are the health effects of being exposed to air pollution?

Acute effects. The immediate effects of being exposed to air pollution are usually linked with respiratory disorders. The main symptoms are as follows: watery eyes; burning sensations in the eyes, nose and throat; nasal congestion; chest tightness; difficulty breathing; irregular breathing; coughing; and wheezing. Other signs are headaches, dizziness, weakness, fatigue and chest pain (AAP, 2003). Indoor air pollutants may also trigger asthma and allergy episodes.

Recommended Immediate Response to Acute Symptoms of Air Pollution

(AAP, 2003)

When children show symptoms commonly linked with air pollutants (see above), *the following actions should be taken immediately:*

- Identify suspected pollutants.
- Remove suspected polluting source or remove child(ren) from the environment.
- If pollutant is indoors, increase ventilation (movement of air). Turn on fans. Open windows and doors to the outside.

Chronic effects. In addition to the acute effects described above, which are usually temporary, air pollution is linked with more serious long-term health problems such as asthma, cancer and respiratory in-

fections. All long-term effects depend upon how much air pollution there was and for how long the air pollution lasted. For more information on asthma, see the *Asthma Information Packet* (California Childcare Health Program [CCHP], 2005) (<http://www.ucsf-childcarehealth.org/html/pandr/trainingcurmain.htm#asthma>).

Detection of air pollution problems in ECE programs.

Symptoms can provide a useful sign of air pollution problems (AAP, 2003). As mentioned above, the acute effects of air pollutants are usually irritations to the respiratory system, headaches, nausea and dizziness. Unfortunately, these symptoms are also the symptoms of common allergies, respiratory infections and flu. When symptoms occur, many pollutants may be involved at the same time. The key is that symptoms usually go away when the toxin or chemical is eliminated. It is important to note the time and place where symptoms occur and whether a number of children are affected (although some children are much more sensitive to certain pollutants than others). For example, if symptoms like those described above occurred in the ECE program only after the carpeting and wall paneling had been professionally cleaned, and went away when the children left the building, this would suggest that air pollution associated with these cleaning activities may be the cause. It is important to clean and sweep when the children are not present.

How to identify outdoor air hazards in ECE programs

Outdoor air pollution can vary from day to day. The best way to keep track of such changes depends upon the location of the ECE program.

Metropolitan areas. In many metropolitan areas, local radio stations, TV news programs and newspapers provide regular updates on air quality conditions. Various Web sites also list weather conditions and air quality updates daily. One useful Web site is: <http://www.weather.com/activities/health/airquality/?from=healf>.

Rural areas. In more rural areas, learning about pollutant levels may require different information-seeking strategies. Two government sources of infor-

mation about community air quality measurements are state departments of environmental protection and regional EPA offices. The California Air Resources Board (ARB) gathers air quality data around the State of California and sets air quality standards for the state. ARB provides maps of areas that violate national and state air quality standards (see the ARB Web site, <http://www.arb.ca.gov/homepage.htm>).

A third source is the Environmental Defense Organization Scorecard, which is a public action organization that provides a scorecard of summary information on air pollution by zip code and identifies the major polluters (e.g., industrial or agricultural activities) in each zip code region. Information can be found on their Web site: <http://www.scorecard.org>. However, it does not provide daily updates of air quality conditions.

How to identify indoor air hazards in ECE programs

Air pollutants are everywhere in the indoor environment. Volatile organic compounds (VOCs) are used in common household products such as oven and rug cleaners, air fresheners, water repellents, paints, lacquers, building materials and furnishings. Gases, such as carbon monoxide, can come from appliances that burn gasoline, oil, coal or wood, and are not working as they should. See Table 3 for a checklist of signs of possible indoor air pollution.

Actions to prevent and manage being exposed to air pollution in ECE programs

To have a healthy environment, it is important to reduce or manage indoor air pollutants. When symptoms are not noticeable, the first step is to identify and be aware of possible hazards in the environment. For assistance with, or information about, state testing regulations and educational programs for indoor air pollutants, each state provides a radon contact and an indoor air quality coordinator. The list of all state contacts is available from the EPA (EPA, 2005). See *Handout: Child Care Inventory for Air Pollution Hazards* for a list of specific hazards to look for in the ECE program. This handout also summarizes specific actions for managing and preventing air pollution that are recommended by the National standards (AAP et al., 2002), AAP (2003) and EPA (2002). For more in-

formation about California-based resources, see the Web site for Cal/EPA, <http://www.calepa.ca.gov/>.

PESTICIDES

Usually we think about pesticides as insecticides—sprays or powders that kill bugs. The EPA definition, however, is much broader and defines pesticides as “any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. Pests can be insects, mice and other animals, unwanted plants (weeds), fungi, or microorganisms like bacteria and viruses” (EPA, 2002). In the United States, over 4 billion pounds of pesticides are used each year. The EPA estimates that U.S. consumers alone spend nearly \$2 billion annually for pesticides for home and garden use, and that 84% of households used at least one pesticide product in the last year.

By their very nature, most pesticides create some risk of harm to people, animals or the environment because they are designed to kill or otherwise harm living organisms. In other words, *what is poisonous to bugs and animals is also poisonous to people*. With the exception of poison baits, as little as 1% of pesticides applied indoors reach the targeted pest. The rest may pollute surfaces and air in the treated environment. Outdoor pesticides may fall on nontargeted organisms, plants, animals, and outdoor furniture and play areas. They may also pollute groundwater, rivers or wells. In addition, some pesticides, such as the insecticide DDT, can remain in the soil for over 20 years. Although DDT was banned in the United States in 1973, children can still be exposed to this chemical through touching polluted soil, eating foods grown in polluted soil or eating fish from polluted waters. DDT continues to be used in some developing countries, including those exporting food to the United States.

Outdoor sources of pesticides in ECE programs

If ECE programs are located near areas that spray pesticides for agricultural or business purposes, children may be at high risk of being exposed to pesticides in the air, dust and soil. Baker, Fitzell, Seiber, Parker, Shibamoto and Poore (1996) measured levels of some pesticides in the air near beet and potato fields in California and found air levels of some to be far more than the federally indicated safe levels. Golf courses use herbicides to keep weeds from invading

TABLE 3: CHECKLIST FOR SIGNS OF POSSIBLE INDOOR AIR QUALITY PROBLEMS IN ECE PROGRAMS

When observing an ECE program, the CCHA should:
<p>Check for:</p> <ul style="list-style-type: none"> • the general level of cleanliness • presence of mold or mildew • dirty or faulty central heating or air conditioning equipment such as dirty air filters or ducts • damaged flue pipes or chimneys • blocked vents or air intakes • unvented combustion air sources for fossil fuel (e.g., gas, wood, kerosene) appliances • tight building construction or evidence of remodeling • new furniture or carpeting • improperly stored chemicals <p>Smell:</p> <ul style="list-style-type: none"> • unusual and noticeable odors, such as mold, mildew or “chemical” smells • stale or stuffy air <p>Feel:</p> <ul style="list-style-type: none"> • noticeable lack of air movement • too much humidity • uncomfortable air temperatures • air flowing into and out of vents • drafts <p>Listen for:</p> <ul style="list-style-type: none"> • concerns of staff about indoor air quality • unusual equipment noises • air blowing out of supply vents
<p>Adapted from EPA, Montana State University Extension Service and U.S. Department of Agriculture [USDA]. Healthy Indoor Air for America’s Homes Program, 2002; and U.S. EPA Indoor Air Quality Tools for Schools Kit – Walkthrough Inspection Checklist, 2002.</p>

their grass surfaces. Power companies often spray herbicides under transmission and distribution power lines to keep unwanted vegetation from interfering with the company’s ability to maintain the lines. See *Handout: Health and Safety Notes: Keeping Children Safe from Pests and Pesticides*.

Residential/community spraying. In 1995, homeowners used nearly 133 million pounds of pesticides, herbicides and fertilizers on their lawns and gardens alone. Young children are at greater risk for

exposure to lawn and garden pesticides. This is because their crawling and play behaviors increase their contact with grass and ground surfaces, and their hand-to-mouth behaviors make it more likely that they will swallow pesticide residues from their hands. ECE programs should be aware of whether their neighbors use pesticides on their lawns.

Playgrounds. Most wooden playground structures, picnic tables and decks are made of treated wood that has been injected with chromated copper

arsenate (CCA), a wood-preserving pesticide made up of arsenic, copper and chromium. This preservative protects the lumber against termites, beetles and rot. Arsenic, however, is known to cause cancer. Studies have shown that over time CCA steadily leaves the treated wood and goes into the surrounding soil. Children can absorb the arsenic preservatives through their skin when they touch the wood, nearby polluted dirt or sand. They can swallow it when they then put their hands in their mouths. There are ways to treat the wood so that the chemical does not go into the soil, but rather is sealed into the wood. Three types of coatings that can seal the chemical are as follows: latex primer followed by one coat of outdoor latex paint; oil-based primer followed by one coat of oil-based paint; or two coats of a penetrating oil semitransparent deck stain (Jahn & Payne, 2002). Many play structures have been replaced because of this problem. Since 2004, the chemical CCA is no longer used on children's playgrounds.

Insect repellents. Insect repellents are designed to be applied to people's skin to repel insects rather than kill them. DEET is the active ingredient in most insect repellents. It was developed by the U.S. Army during World War II and registered for general public use in 1957 (EPA, 2005). DEET is toxic when swallowed, and high levels applied to the skin can cause blistering. *For children, AAP (2003) recommends using repellents containing no more than 10% DEET.* DEET repellents should be used very sparingly on children aged 2 to 6, and not at all on infants and children under age 2. Also, insect repellents should not be applied to children's hands to prevent children from eating DEET (CCHP, 2004). See *Handout: Health and Safety Notes: The Use of Insect Repellent by Child Care Programs*. More natural insecticides, such as citronella (for example, Avon's Skin-So-Soft® bath oil) and soybean oil, are not as effective as DEET in preventing insect bites and also need to be reapplied often. The safety of repeated applications of natural insect repellents on children has not been determined, and *providers should not confuse the term "natural" with "safe" when using these products on children* (Schneider & Freeman, 2000).

Indoor sources of pesticides in ECE programs

Generally, indoor environments have higher amounts of pesticides than outdoor environments because some

pesticides are used indoors and others are tracked indoors from soil on shoes and from pets that have been outside (National Pesticide Telecommunication Network, 2005). Residues from both indoor and outdoor pesticide treatments have been found in carpet dust for days and weeks after the pesticide was applied. Pesticides stay longer in indoor environments because of the lack of exposure to sun, rain and fresh air, which helps to dilute pesticides and break them down.

Household products. In addition to insecticides, common indoor pesticides include cleaning products such as disinfectants (for germs) and fungicides (for mold and mildew). Whenever possible, ECE programs should use less toxic cleaning products to protect children. It is also important to clean when children are not present. See *Handout: Less Toxic Alternatives to Common Hazardous Products*.

Food. The AAP (2003) notes that, worldwide, pesticides are not only used extensively during farming, but also during the shipping and storage of foods. Wiles and Campbell (1995) analyzed some of young children's favorite foods (for example, fruit and fruit juices, milk, wheat and oats) and found pesticides in 50% of them. Foods are also likely to have more than one pesticide. Even processed baby foods can contain some pesticides (AAP, 2003). The EPA sets standards for allowable levels of pesticides in foods, and the Food and Drug Administration (FDA) and the USDA Food Safety Inspection Service monitor the amounts of pesticides in the food supply. In 1996, the Food Quality Protection Act was passed, which provided more protection for pesticide-safe food for infants and young children. This federal environmental law explicitly and strictly protects children (Mott et al., 1997). It requires the EPA to consider the *cumulative* risk of pesticide exposure from *all* sources (e.g., food, water, air) when evaluating pesticide safety.

Drinking water. Drinking water is vulnerable to pollution by agricultural chemicals, pesticides, herbicides and fungicides. ECE programs that rely on wells for drinking water are especially at risk. The well water could become polluted by pesticide residues and by runoff and seepage from neighboring farms.

Pets. Children who play with pets treated for fleas, ticks and other pests can be exposed to pesticides. Flea collars, shampoos, soaps, sprays, dusts,

powders and dips usually contain an insecticide. For more information, see *Handout: Health and Safety Notes: Pets in the Child Care Setting*.

What are the health effects of being exposed to pesticides?

Acute. The effects of pesticides range from irritation of the eyes, nose and throat; mild dizziness; nausea and vomiting; diarrhea; headaches; and skin rashes, to severe illness and even death (AAP, 2003). More severe reactions usually result from massive doses in accidental poisoning, chemical spills, inappropriate application or prolonged exposure.

Chronic. Being exposed to pesticides has been linked to damage to the nervous system, reproductive system, endocrine system and immune system; cancer; chronic injury to the lungs, liver and kidneys; and birth defects. For children specifically, pesticides have been linked to brain cancers and childhood leukemia (AAP, 2003). The long-term effects of pesticides depend upon how toxic the pesticide is, how long the child was exposed to the pesticide and how much of the pesticide the child was exposed to.

Actions to prevent and manage being exposed to pesticides in ECE programs

One approach to controlling long-term pests is called Integrated Pest Management (IPM). IPM is a relatively new approach to long-term pest control. It relies on both chemical and nonchemical methods. The goal of IPM is to use the pest control strategy that is least toxic to people and the environment, and to use the least amount of treatment needed to manage any given pest problem (EPA, 2002). With this approach, instead of techniques such as regular or automatic spraying to manage indoor insect problems, strategies might include the following:

- Repair screens and caulk around windows to prevent pests from entering.
- Restrict eating to certain areas.
- Empty trash cans at the end of the day.
- Store food in containers with tightly fitting lids.
- Vacuum up the eggs of fleas before they hatch.
- Keep foods cleaned up in the kitchen.

Outdoor pest control strategies might include the following:

- Keep shrubs and wood mulch at least 1 foot away from play structures and buildings.
- Reduce clutter that gives pests easy places to hide.
- Use trash cans with tightly fitting lids.
- Choose plants suited to the soil and climate of the site so that fungicides, herbicides and insecticides are not as necessary.
- Use predators like ladybugs to control unwanted insects.

Another feature of IPM is that regularly scheduled pesticide treatments (e.g., every 3 months) are replaced by treatments given only *as needed* and as a last resort when less toxic treatments have been ineffective. Treatments are also chosen and timed to be least harmful to people and animals. All pesticides must be labeled with the level of toxicity. *Caution* means low toxicity, *danger* means moderate toxicity and *warning* means high toxicity. IPM encourages using pesticides that are labeled *caution* rather than *danger* or *warning*, and recommends using spot treatments rather than applying pesticides throughout an entire area (National Pesticide Information Center, 2005). As part of its continuing effort to protect children from being exposed unnecessarily to pesticides, the EPA (2002) encourages school officials (and also ECE programs) to adopt IPM practices.

The local health department, CDC or Cal/EPA can be contacted to get information about the local area. Include this information in environmental health policies you develop. The EPA Web site at <http://www.epa.gov> also has a series of checklists to help you check the ECE program for environmental hazards.

DRINKING WATER POLLUTION

The safety of water is important to a child's health (AAP, 2003). Children drink more water per kilogram of body weight than adults. Of the earth's water, only 3% is fresh, and of that 3%, only 1% is available for human use. The United States gets about half of its drinking water from ground water (underground aquifers) and the other half from surface water (rivers and lakes) or mixed surface and ground water sources. The United States has one of the safest water supplies in the world (EPA, 2005). It is safe to drink water

from almost every public water system in the country. However, the *quality* of drinking water may vary in different parts of the state, depending upon the county regulating the water supply. For more information on California water, see the State Water Resources Control Board Web site, <http://www.waterboards.ca.gov/>. Water suppliers are legally required to tell customers immediately if pollution poses an urgent health threat (EPA, 2005). These federal standards apply to all water suppliers serving 25 or more consumers, but not to smaller suppliers or to private wells. However, some states and counties have standards that apply to wells. Otherwise, people receiving water from private wells are responsible for making sure their own drinking water is safe.

Sources of water pollution in ECE programs

Hundreds of bacteria, viruses and parasites, and literally thousands of chemicals are found in fresh water supplies. They are most often filtered out by water processing plants.

Public water supplies. In most cases, pollutants in public water supplies are at levels that do not pose immediate threats to public health. The serious pollution of drinking water does occur, but it does not happen often and usually does not last long. Most often, serious pollution is caused by treatment problems or extreme weather events. For example, if a public water system gets water from a highly polluted river, lake or ground water well, it may be hard to treat the water to meet safety standards.

Well water. As mentioned earlier, private wells are not federally regulated and must be maintained by the homeowner. The AAP (2003) notes that “pollution of well water may occur if the well is shallow, in porous soil, old, poorly maintained, near a leaky septic tank or downhill from agricultural fields or intensive livestock operations.” If the ECE provider has a private well at the ECE program, the ECE provider is responsible for testing the water to make sure it is safe. This is especially important in areas where homes and nearby businesses are on septic systems (EPA, 2005). Since many pollutants are colorless and odorless, testing is the only way to tell whether the well water is safe to drink. EPA drinking water standards and health information are good guidelines to follow in protecting the drinking water. To detect pollution

problems early, test wells every year for bacteria. If there is a problem, test more frequently and for more potential pollutants, such as radon, pesticides or industrial chemicals (EPA, 2005).

How are children exposed to water pollution?

Children are exposed to water pollutants when they drink polluted water, eat raw foods (e.g., carrots, tomatoes) irrigated or rinsed with polluted water, eat fish or shellfish from polluted water, or get water on their skin from swimming or wading in polluted water (AAP, 2003).

What are the health effects of being exposed to water pollution?

Acute reactions are usually due to microbial pollutants (such as bacteria and viruses) and may include vomiting or diarrhea. Long-term exposure to some pollutants in water, such as pesticides, minerals and solvents, may cause stomach problems, skin irritations, cancer, reproductive and developmental problems, and other chronic health effects (AAP, 2003). For most water pollutants, little is known of long-term health effects.

How to identify water pollution health hazards in ECE programs

Even with state-of-the-art water treatment systems, periodic and widespread water pollution can occur. This water pollution can cause illness in children. The AAP (2003) reports that the most common symptoms of such illnesses are mild stomachaches with diarrhea. While there is often no specific source for these symptoms, an outbreak of such symptoms in the ECE program may indicate water pollution.

Actions to prevent and manage water pollution

See *Handout: Child Care Inventory for Water Pollution Hazards* for a list of specific water pollution hazards to look for in ECE programs. This handout summarizes specific actions for managing and preventing water pollution, as recommended by AAP et al. (2002), AAP (2003), EPA (2005) and Mott et al. (1997).

WHAT A CCHA NEEDS TO DO

Observe Program and List Environmental Hazards

The CCHA can observe an ECE program with the ECE provider and list any environmental hazards in the program. The CCHA's role is to help the ECE provider to do the following:

- Identify and prioritize the key environmental hazards.
- Establish policies for managing these hazards.
- Develop strategies for carrying out the policies.

Help Develop Policies

The CCHA should do the following: help ECE staff to develop policies and procedures that will decrease environmental hazards; help ECE staff to come up with practical and specific ways to make sure that those policies are appropriately and consistently carried out; and recommend when these policies and procedures should be periodically revised. The CCHA should also give the ECE provider sample policies and procedures, including policies on what to do if problems occur because of lead, pesticides, and air and water pollution.

Educate Staff on Environmental Hazards

CCHAs can educate staff on environmental health hazards and exposures. The CCHA should use examples and do a “walk-through” of the facility with staff members, using a checklist to make sure that trouble spots are monitored. CCHAs can train ECE staff on the unique vulnerability of children to environmental exposures. The CCHA should know the environmental hazards and resources for the local area. For example: What environmental health hazards are regularly measured and tracked in the area? How is the information publicized? Through local news media? Cal/EPA? Where is the nearest EPA regional office and what is their contact information? For more information on environmental health hazards, see *Handout: Supplementary Materials on Environmental Topics of Special Interest to ECE Providers*.

Provide Educational Materials

The CCHA should provide educational materials in many languages. Visual aids, such as posters, should be used when available. Handouts can help parents be aware of environmental health issues. The CCHA should also share resources with providers and parents about where they can get additional information (e.g., books, Web sites, journals and organizations).

Link ECE Providers with Environmental Health Specialists

In a field like environmental science, where information develops rapidly and very technical expertise is often required, it is important for the CCHA to connect ECE providers with environmental health specialists. The CCHA must highlight ECE issues for environmental health specialists and may need to interpret environmental health information for ECE providers. To accomplish this task, the CCHA must do the following:

- 1) Stay up-to-date with current trends and issues in the environmental health field and be familiar with the following:
 - key environmental health concepts
 - relationships between health and the environment
- 2) Be sensitive to the ideas and needs of the ECE staff regarding environmental health issues and recommendations.

Assessment of Environmental Health Hazards in ECE Programs

A major role of the CCHA is to help ECE providers look for actual and potential environmental hazards in the ECE program. In addition to knowing what hazards to look for, it is important to have good observational and communication skills to carry out this task. To look for environmental hazards, it is recommended that standardized tools such as the ones described below be used. These checklists cover environmental health hazards for children:

- *Early Childhood Environmental Rating Scales-Revised [ECERS-R]* (Harms, Clifford & Cryer, 2004)

- *CCHP Health and Safety Checklist-Revised* (2005)
- *Indoor Air Quality Tools for Schools Walkthrough Inspection Checklist* (EPA, 2002b)
- *Sample Pest Management Survey* in the report *Poisoned Schools: Invisible Threats, Visible Actions* (Center for Health, Environment, and Justice, 2001)
- *Help Yourself to a Healthy Home* (USDA Home*A*Syst and Farm*A*Syst national program, 2001)
- *How Asthma-Friendly Is Your Child Care Setting? Checklist* (National Heart, Lung, and Blood Institute; National Asthma Education and Prevention Program; and School Asthma Education Subcommittee, 2002)
- *Chemical Hazard Survey and Action Plan for ECE Programs* (CCHP, 2004) (see *Handout: Chemical Hazard Survey and Action Plan for ECE Programs*)

Help the ECE Provider Evaluate Information from the Media

The CCHA can help the ECE provider to evaluate media information about environmental health and children, and use it to make good choices for the ECE program. Provocative information about environmental exposures appears almost daily in the media. In understanding such information, the CCHA should keep the following in mind:

- Where is the information coming from and is the source trustworthy?
- If a link is found between an environmental substance and a harmful effect, how many studies back it up?
- How strong is the link between the apparently harmful substance and the effect created?
- Does increasing the “dose” or exposure of the toxin increase the chance of harmful effects?

Thompson (2000) asks parents and others to keep 10 points in mind as they consider environmental health information reported in the media:

1. Life will never be risk-free.

There is no such thing as zero risk. We all face many risks everyday. For example, we risk the possibility of choking or getting food poisoning every time we eat. And we risk an injury every time we ride in a car.

2. Hazards for children and adults differ.

Being exposed to some toxins are riskier for children. Others are riskier for adults.

3. The amount of exposure to the hazard and how the exposure occurs matter.

For most chemicals, when the child is exposed, the chances of getting sick are low. The way the child was exposed to the chemical also makes a difference.

4. Testing chemicals in animals gives useful, but not perfect, information about the effects of chemicals on people.

Toxicity tests typically use small numbers of animals that are given large doses of potentially harmful chemicals to study their effects on the animals’ health. The results of the animal studies do not always mean that the same health effect in people will be found, since people may have lower levels of exposure and respond differently than animals.

5. We all want safe products.

Responsible manufacturers want safe products too. They must consider their legal responsibility if they produce an unsafe product.

6. Some really important hazards for children do not make enough news.

Some of the biggest hazards, such as guns, child abuse and neglect, are so common they are not considered newsworthy.

7. Some tentative, minor hazards for children make too much news.

Bisphenol-A in baby bottles and phthalates in children’s toys recently made headlines. In both cases, risk assessments suggested very small and uncertain potential hazards. The Internet in particular allows the rapid spread of anonymous, inaccurate information.

8. It is never too soon to start teaching children about hazards.

We must teach children to manage risk and to be cautious, but not overly afraid.

9. The media itself can misinterpret hazards.

The media reduces stories to “sound bites” to make headlines, but there is often much more to the story. Setting personal priorities based on the “health news of the day” can result in an unjustified fear of unlikely hazards and a lack of sufficient concern about known hazards.

10. We need to work together.

Everyone has a role to play, including CCHAs and ECE providers.

Advocacy

By the very nature of the services they perform, CCHAs are perceived as trusted members of the community who have the best interests of children and families at heart. As such, they are in a good position to encourage and support good environmental practices in ECE programs, the community and the state. Child advocacy is at the center of the CCHA job description. In the field of environmental health, there is much work for the CCHA to do. Just a few examples are below.

In the community, the CCHA can do the following:

- Advocate for a healthier community water supply. Network with local agencies and groups to learn about the source of your drinking water, and get involved in activities to protect it.
- Advocate for an expanded organic foods section in local grocery stores. Recommend that ECE programs wash all fruits and vegetables carefully before serving to children.
- Ask the local school board about pest control policies in one school and encourage them to use IPM techniques.
- Ask local authorities to create a community pesticide sensitivity list requiring ECE programs to be notified when significant outdoor commercial or residential pesticides are applied.
- Work with local parks and recreation associations to investigate the status of any public playground structures treated with CCA.
- Work with local authorities to restrict or reduce community-approved spraying of pesticides both within the community and in surrounding areas.
- Network with local authorities to improve air

quality in your community. Discover the sources of major air pollutants.

In California, the CCHA can do the following:

- Ask state pesticide officials to create a statewide pesticide sensitivity list.
- Ask for the removal or management of lead paint in lower-income neighborhoods.
- Be aware of new laws on environmental issues that affect children. Develop ways to actively support laws that protect children and oppose laws that may bring harm.

In the ECE program, the CCHA can do the following:

- Reduce the chemicals in the environment to those that are essential, effective and safe.
- Obtain and post Material Safety Data Sheets (MSDSs) for every chemical used. These sheets list the chemicals included in the product and how toxic the product is.
- Perform a chemical survey (see *Handout: Chemical Hazard Survey Action Plan for ECE Programs*).
- Make sure that the ECE program is kept clean (see *Handout: Health and Safety Notes: Recommendations for Cleaning, Sanitizing and Disinfecting*).
- Promote routine preventive health care for children where screening for lead may take place.
- Incorporate environmental themes into educational presentations and activities for both ECE providers and parents.

Cultural Implications

Environmental exposures and health hazards are equally dangerous for all children and families. Some cultures may not recognize the same hazards that other cultures do. Certain accepted cultural practices or lifestyle habits, such as eating dirt, placing dirt on the infant’s cord after birth or eating off of pottery with high lead content, put families at risk. People from other cultures may use folk medicines that may contain lead to help fevers, menstrual cramps and other symptoms. In addition, in some Latino cultures, a deodorant mixture called Litargirio is used which has lead powder in it (CDC, 2005). Educational materials about environmental exposures and health risks in various languages are important to have available for families. Culturally appropriate education is needed

to let people know of the health risks posed by these remedies, particularly in groups of people who commonly use traditional or folk medicine. The EPA has a document, *Protect Your Family from Lead in Your Home*, that has been translated into Somalian, Spanish, Arabic, Vietnamese and Russian. It can be downloaded from the following Web site: <http://www.epa.gov/lead/pubs/leadpdf.pdf> (English) and <http://www.epa.gov/lead/pubs/pyfcameraspan.pdf> (Spanish).

Implications for Children and Families

Environmental exposures and health risks may have devastating effects on both children and families. It is important for the ECE program to make sure that environmental hazards are eliminated or reduced to protect children and their families. ECE providers can also suggest that families check environmental exposures and health risks in their homes to protect children's health.

Implications for ECE Providers

ECE providers are responsible for creating a safe and healthy environment for children. Yet, much of the environment is out of their control (for example, materials used in the construction of their building, or chemicals or pesticides used in their neighborhood). ECE providers, however, can educate themselves about the materials being used within their program, and control the use of these materials. They can also learn more about the exposures and health risks in their immediate environment.

ACTIVITY 1: ENVIRONMENTAL HEALTH ISSUES

Review the following four situations that may happen in ECE programs:

1. A parent called, stating that the staff at her daughter's ECE program are regularly spraying the children's hands and arms with Lysol spray.
2. A center director called, saying her center's kitchen is being remodeled, and she thinks the ceiling tiles are asbestos. What do they need to do?
3. A family care provider called and asked if she needed to treat the sandbox sand with a bleach solution or pesticide because fleas were seen on two of the children in her program.
4. The director of a child care center located on a school campus called with a concern about the school and center being sprayed with pesticides during the summer when school was closed but the child care center was open.

For each situation, answer the questions below:

What would you do in this situation?

What information would you need?

What questions would you ask?

What advice or information would you offer?

Is there any necessary follow-up? And if so, what specifically would it be?

What resources would you share with the ECE programs?

ACTIVITY 2: ECE PROGRAM POLICY DEVELOPMENT

Select one environmental exposure or health risk for children in ECE programs. What specific policies should the CCHA recommend to reduce this risk? Develop a plan of action.

Overall goal(s):

Steps to take to accomplish the goal(s):

How will you know you have achieved your goal?

Who will you ask for help?

ACTIVITY 3: REVIEW ECE PROGRAM CHEMICAL HAZARDS

Using the *Handout: Less Toxic Alternatives to Common Hazardous Household Products*, look at the common products and chemicals found in ECE programs and talk about other products that could be used instead.

NATIONAL STANDARDS

From *Caring for Our Children: National Health and Safety Performance Standards: Guidelines for Out-of-Home Child Care Programs, Second Edition*

Lead: 3.020, 4.029, 5.061, 5.110-5.111, 5.138, 5.179, 5.195, 5.231, 8.048.

Air Quality—General: 5.169, 5.231-5.234.

Air Quality—Biological contaminants: 3.026, 3.028, 3.034, 5.079.

Air Quality—Combustion by products: 5.032, 5.033, 5.034, 5.036, 5.038, 5.229.

Air Quality—Humidity and ventilation: 5.042, 5.028-5.029, 5.031, 5.041.

Air Quality—VOCs and other chemicals: 5.011, 5.100, 5.102, 5.105, 5.108-5.109.

Air Quality—Asbestos: 5.104.

Air Quality—Environmental tobacco smoke: 3.041, 8.038.

Air Quality—Radon: 5.007, 5.103.

Pesticides: 5.105, 5.070-5.074, 5.100, 5.202.

Water Quality: 5.055-5.058, 5.062-5.063.

Appendix I: *Selecting an Appropriate Sanitizer.*

CALIFORNIA REGULATIONS

From *Manual of Policies and Procedures for Community Care Licensing Division*

Title 22, Division 12, Chapter 1, Article 6, Section 101231, 101238, 101238.2, 101238.3, 101238.4, 101239, 101239.2.

RESOURCES

General Environmental Health Organizations and Resources	
Organization and Contact Information	Description of Resources
Center for Health, Environment and Justice www.chej.org	Helps grassroots groups and individuals build upon their strengths. Through organizing leadership development research and technical assistance, they empower individuals with skills and information to make sound judgments and become a part of the political decision-making process to protect health and our natural resources. Publication: Childproofing our communities: Why children need special protection from toxics. www.childproofing.org/vulnerable.html.
Children's Environmental Health Network Headquarters: 110 Maryland Avenue NE, Suite 505 Washington, DC 20002 (202) 543-4033 phone (202) 543-8797 fax www.cehn.org California office: 1604 Solano Avenue Berkeley, California 94707 (510) 526-0081 phone (510) 526-3672 fax	A national multi-disciplinary project whose mission it is to promote a healthy environment and to protect the fetus and child from environmental hazards. Publishes a resource guide on children's environmental health. The Network has worked on the national level since 1992 and has focused on the areas of research, policy and education. The network has both scientific and community listserves that provide persons involved in the children's environmental health field an opportunity to communicate important news in the field. A chronology of children's environmental health can be found at: www.cehn.org/cehn/Chronology.html
Environmental Defense 257 Park Avenue South New York, NY 10010 (212) 505-2100 phone (212) 505-2375 fax www.environmentaldefense.org/home.cfm	Environmental Defense is a national nonprofit organization which links science, economics and law to create innovative, equitable and cost-effective solutions to society's most urgent environmental problems. www.scorecard.org provides an in-depth pollution reports by county, covering air, water, and chemicals.
United States Environmental Protection Agency (EPA) Office of Children's Health Protection http://yosemite.epa.gov/ochp/ochpweb.nsf/homepage	In 1995, the EPA was directed to take into account environmental health risks to infants and children in all risk characterizations and public health standards set for the United States. Web site lists tips to protect children from environmental hazards, publications, and other resources.

General Environmental Health Publications

Carson, R. (1962). *Silent spring*. Greenwich, CT: Fawcett Publications.

Head Start Bureau (1997). *Training guides for Head Start learning community: Sustaining a healthy environment*. Washington, DC: Head Start Information and Publication Center. Retrieved June 7, 2005, from <http://www.bmcc.edu/Headstart/Trngds/Sustaining>.

U.S. Environmental Protection Agency, Office of Research and Development, National Center for Environmental Assessment (2002). *Child-specific exposure factors handbook (Interim Report)*. Washington, DC: EPA.

Lead Related Organizations and Resources

Organization and Contact Information	Description of Resources
<p>Alliance for Healthy Homes 227 Massachusetts Avenue, N.E. #200 Washington, DC 20002 (202) 543-1147 phone (202) 543-4466 fax www.afhh.org</p>	<p>Seeks to protect children from lead and other environmental health hazards in and around their homes by advocating for policy solutions and building capacity for primary prevention in communities throughout the U.S. Sponsors two list serves related to lead poisoning prevention and healthy homes: Leadnet and Healthyhomesnet.</p>
<p>Centers for Disease Control and Prevention Childhood Lead Poisoning and Prevention Program Division of Environmental Hazards and Health Effects National Center for Environmental Health www.cdc.gov/nceh/lead/lead.htm</p>	<p>The agency was created as a result of the Lead Contamination Control Act of 1988. It provides funding to state and local health departments to determine the extent of childhood lead poisoning, screen children for elevated blood lead levels, help ensure that lead-poisoned infants and children receive medical and environmental follow-up, and develop neighborhood-based efforts to prevent childhood lead poisoning.</p>
<p>The National Lead Information Center (NLIC) (800) 424-LEAD (5323) www.epa.gov/lead/nlic.htm</p>	<p>Provides information about lead hazards and their prevention. Operates under a contract with the U.S. Environmental Protection Agency (EPA), with funding from EPA, the Centers for Disease Control and Prevention, and the Department of Housing and Urban Development. Downloadable materials available.</p>
<p>National Resources Defense Council 40 West 20th Street New York, NY 10011 (212) 727-2700 phone (212) 727-1773 fax www.nrdc.org NRDC REGIONAL OFFICES 111 Sutter St., 20th floor San Francisco, CA 94104 (415) 875-6100</p>	<p>Fact sheet about Lead Paint in Schools in English and Spanish can be found at: www.nrdc.org/health/kids/qleadsch.asp</p>
<p>United States Department of Housing and Urban Development (HUD) 451 7th Street S.W. Washington, DC 20410 (202) 708-1112 www.hud.gov</p>	<p>HUD's mission is to increase homeownership, support community development and increase access to affordable housing free from discrimination. Publication: Eliminating Childhood Lead Poisoning: A Federal Strategy Targeting Lead Paint Hazards. President's Task Force on Environmental Health Risks and Safety Risks to Children. www.hud.gov/offices/lead/reports/fedstrategy2000.pdf. This report focuses primarily on expanding efforts to correct lead paint hazards (especially in low-income housing), a major source of lead exposure for children.</p>

Lead Related Publications

Centers for Disease Control and Prevention. (2002). *CDC's lead poisoning prevention program*. Retrieved August 23, 2005, from <http://www.cdc.gov/nceh/lead/factsheets/leadfacts.htm>.

Air Pollution Related Organizations and Resources

Organization and Contact Information	Description of Resources
<p>American Academy of Allergy, Asthma, and Immunology 555 East Wells Street, Suite 1100 Milwaukee, WI 53202-3823 (414) 272-6071 www.aaaai.org</p>	<p>Provides descriptions of many different types of allergies and of asthma; provides a medication guide; lists pollen counts. Resources also available in Spanish.</p>
<p>Asthma and Allergy Foundation of America 1233 20th Street, NW, Suite 402 Washington, D.C. 20036 (202) 466-7643 phone (202) 466-8940 fax www.aafa.org</p>	<p>AAFA provides practical information, community based services and support through a national network of chapters and support groups. AAFA develops health education, organizes state and national advocacy efforts and funds research to find better treatments and cures. AAFA also offers asthma care training for children, and asthma and allergy essentials for ECE providers.</p>
<p>California Indoor Air Quality (IAQ) Program 850 Marina Bay Parkway (M.S. G365 / EHLB) Richmond, CA 94804 (510) 620-2874 phone (510) 620-2825 fax www.cal-iaq.org</p>	<p>The mission of the California Indoor Air Quality (IAQ) Program is to conduct and promote the coordination of research, investigations, experiments, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, and control of indoor pollution in California. The Indoor Air Quality Assistance Hotline offers guidance and information about indoor air quality issues.</p>
<p>Healthy Indoor Air for America's Homes Montana State University Extension Service Taylor Hall Bozeman, MT 59717 (406) 994-3451 phone (406) 994-5417 fax www.healthyindoorair.org www.montana.edu/wwwcxair</p>	<p>A national consumer education program concerned with improving the quality of indoor air in homes. Helps provide awareness of indoor air quality issues such as radon, secondhand smoke, asthma, lead, combustion gases and carbon monoxide, formaldehyde, molds and other biologicals, asbestos, and air hazards associated with home remodeling, carpeting and household products. This is a partnership program of the U.S. Environmental Protection Agency-Indoor Environments Division, Montana State University Extension Service Housing Program, and the U.S. Department of Agriculture Cooperative State Research, Education, and Extension Service.</p>
<p>National Safety Council Radon Hotline (800) SOS-Radon (1-800-767-7236) www.nsc.org/ehc/radon.htm</p>	<p>Radon Hotline provides an informational recording 24 hours a day. Through this automated system, callers can order a brochure on radon which contains information on ordering a low-cost short-term test kit.</p>
<p>U.S. Environmental Protection Agency Indoor Air Quality www.epa.gov/iaq</p>	<p>Contains fact sheets on sources of indoor air pollution and health effects including: volatile organic compounds, mold, radon, smoke-free homes, and asthma. Also in Spanish.</p>

Air Pollution Related Publications

Asthma and Allergy Foundation of America, New England Chapter. (2002). *Controlling asthma triggers at home, at child care, and at school*. Retrieved June 3, 2005, from <http://www.asthmaandallergies.org/Controlling.html>.

Asthma and Allergy Foundation of America, New England Chapter. (2001). *Information for childcare providers*. Retrieved June 3, 2005, from <http://www.asthmaandallergies.org/childcare.html>.

Head Start Information and Publication Center (2002). *National training guides: Caring for children with chronic conditions (Module 3): Putting it all together: Caring for children with asthma*. Retrieved June 13, 2005 from, http://www.headstartinfo.org/publications/children_cc/cccont.htm.

Healthy Homes Partnership (2002). *Help yourself to a healthy home: Protect your children's health*. Madison, WI: Regents of the University of Wisconsin System. Retrieved August 14, 2005, from <http://www.hud.gov/offices/lead/healthyhomes/healthyhomebook.pdf>.

Jancin, B. (1999). Keep an eye on fatal four indoor air pollutants. *Pediatric News*, 33 (8), 8.

McConnell, R., Berhane, K., Gilliland, F., London, S.J., Islam, T., Gauderman, W.J., et al. (2002). Asthma in exercising children exposed to ozone: a cohort study. *The Lancet*, 359(9304),386-391.

Myhrvold, A.N., Olsen, E., Lauridsen, O. (1996). Indoor environment in schools-pupils health and performance in regard to CO2 concentrations. *Indoor air '96: the Seventh International Conference on Indoor Air Quality and Climate*, 4, 369-371.

National Cancer Institute (2005). *Cancer facts: Environmental tobacco smoke*. Retrieved August 10, 2005, from http://cis.nci.nih.gov/fact/10_18.htm.

National Safety Council (2001). *Air quality problems caused by floods*. Washington, DC: Environmental Health Center. Retrieved August 23, 2005, from <http://www.nsc.org/ehc/indoor/floods.htm>.

Pew Environmental Health Commission. (2000). *Asthma attack: why America needs a public health defense system to battle environmental threats*. Retrieved June 13, 2005, from <http://healthyamericans.org/reports/files/asthma.pdf>.

Pope, A..C, Burnette, R.T., Thun, M.J., Calle, E.E., Krewski, D., Kazuhiko, I., & Thurston, G.D. (2002). Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. *JAMA*, 287(9), 1132-1141.

U.S. Consumer Product Safety Commission, U. S. Environmental Protection Agency, and American Lung Association, IAQ Publications. (2002). *What you should know about combustion appliances and indoor air pollution*. Retrieved August 23, 2005, from <http://www.epa.gov/iaq/pubs/combust.html>.

U.S. Environmental Protection Agency, Indoor Environments Division. (2000). *Indoor air quality: Tools for schools, IAQ coordinator's guide*. Retrieved August 23, 2005, from <http://www.epa.gov/iaq/schools/tools4s2.html>.

U.S. Environmental Protection Agency. (1995). *The inside story: a guide to indoor air quality. Basic fact sheets*. Washington, DC: Office of Air and Radiation Retrieved August 23, 2005, from <http://www.epa.gov/iaq/pubs/insidest.html>.

Pesticide Related Organizations and Resources	
Organization and Contact Information	Description of Resources
California Healthy Schools Campaign (888) CPR-4880 www.calhealthyschools.org	Goal is to protect the health of California's children and teachers. Resources available from this Web site include fact sheets and a pesticide action kit with a list of 10 steps to make the environment at schools healthier.
National Pesticide Information Center (NPIC) (800) 858-7378 http://npic.orst.edu	Provides objective, science-based information about a variety of pesticide-related subjects, including pesticide products, recognition and management of pesticide poisonings, toxicology, and environmental chemistry. Also lists state pesticide regulatory agencies with links to sites.
Pesticide Action Network North America (PANNA) 49 Powell St., Suite 500 San Francisco, CA 94102 (415) 981-1771 phone (415) 981-1991 fax www.panna.org	Works to replace pesticide use with ecologically sound and socially just alternatives. As one of five PAN Regional Centers worldwide, PANNA links local and international consumer, labor, health, environment and agriculture groups into an international citizens' action network. The Pesticides Database provides information on current toxicity and regulatory information for pesticides.

Pesticide Related Publications

Centers for Disease Control and Prevention (2002). *Travelers' health. Protection against mosquitoes and other arthropod vectors*. Retrieved June 3, 2005, from <http://www.cdc.gov/travel/bugs.htm>.

Minnesota Department of Health, Environmental Health Division. (2000). *Facts about chemicals and practical steps you can take to reduce children's exposure*. Minneapolis, MN: Minnesota Department of Health.

U.S. Environmental Protection Agency, Office of Pesticide Programs. (2005). *Alphabetical list of pesticide fact sheets*. Retrieved August 23, 2005, from http://www.epa.gov/pesticides/factsheets/alpha_fs.htm.

U.S. Environmental Protection Agency. (2002). *Pesticides and food: what you and your family need to know*. Washington, DC: Office of Pesticide Programs. Retrieved August 23, 2005, from <http://www.epa.gov/pesticides/food>.

U.S. Environmental Protection Agency. (1995). *Citizen's guide to pest control and pesticide safety*. Retrieved August 23, 2005, from http://www.epa.gov/OPPTpubs/Cit_Guide/citguide.pdf.

Water Pollution Related Organizations and Resources	
Organization and Contact Information	Description of Resources
U.S. Environmental Protection Agency Office of Ground Water and Drinking Water Ariel Rios Building 1200 Pennsylvania Avenue, NW Washington, DC 20460-0003 (202) 564-3750 phone (202) 564-3753 fax www.epa.gov/safewater/index.html	OGWDW, together with states, tribes, and partners, protects public health by ensuring safe drinking water and protecting ground water. Oversees implementation of the Safe Drinking Water Act, which is the national law safeguarding tap water in America. Fact sheet about lead in drinking water can be found at: www.epa.gov/safewater/lead/index.html
Safe Drinking Water Hotline (800) 426-4791	Provides the general public, regulators, medical and water professionals, academia, and media, with information about drinking water and ground water programs authorized under the Safe Drinking Water Act.

REFERENCES

American Academy of Dermatology. (2005). *Sun protection for children: Parents' Guide to Sun Protection for Children The ABCs for FUN in the SUN*. Retrieved December 4, 2005, from www.aad.org/public/Publications/pamphlets/SunProtectionChildren.htm.

American Academy of Pediatrics, Committee on Environmental Health. (2003). *Pediatric environmental health*. Second Edition. Elk Grove Village, IL: American Academy of Pediatrics.

American Academy of Pediatrics, American Public Health Association, & National Resource Center for Health and Safety in Child Care. (2002). *Caring for our children: National health and safety performance standards: Guidelines for out-of-home child care programs, Second edition*. Elk Grove, IL: American Academy of Pediatrics.

Arts, Crafts and Theatre Safety, Inc. (2000). *Selecting children's art materials*. New York (NY): Arts, Crafts and Theatre Safety, Inc.

Baker, L.W, Fitzell, D.L., Seiber, J.N., Parker, T.R., Shibamoto, T., & Poore, M.W. (1996). Ambient air concentrations of pesticides in California. *Environmental Science and Technology*, 30, 1365-1368.

Bearer, C.B. (1995). Environmental health hazards: how children are different from adults. *The Future of Children*, 5(2) Summer/Fall. Retrieved May 26, 2005, from www.futureofchildren.org/information2826/information_show.htm?doc_id=70956.

California Childcare Health Program (2005). *Asthma Information Packet*. Oakland, CA: Author

California Childcare Health Program (2005). *CCHP Health and Safety Checklist-Revised*. Oakland, CA: Author.

California Childcare Health Program (2004). *Chemical Hazard Survey*. Oakland, CA: Author.

California Childcare Health Program (2004). *Health and Safety Notes: Use of insect repellent by child care programs*. Oakland, CA: Author.

Centers for Disease Control and Prevention (2005). Lead poisoning associated with use of litargirio—Rhode Island, 2003. *MMWR*, 54(09), 227-229. Retrieved December 6, 2005, from www.cdc.gov/mmwr/preview/mmwrhtml/mm5409a5.htm.

Centers for Disease Control and Prevention (1999). Achievements in public health, 1900-1999: Healthier mothers and babies. *MMWR Weekly*, 48(38), 849-58. Retrieved June 3, 2005, from www.cdc.gov/mmwr/preview/mmwrhtml/mm4838a2.htm.

Centers for Disease Control and Prevention (2002). *What every parent should know about lead poisoning in children*. Retrieved June 3, 2005, from www.cdc.gov/nceh/lead/faq/cdc97a.htm.

Centers for Disease Control and Prevention, Travelers' Health. (2005). Protection against mosquitoes and other arthropod vectors. Retrieved December 4, 2005, from www2.ncid.cdc.gov/travel/yb/utills/ybGet.asp?section=children&obj=children_gen_info.htm&cssNav=browseoyb.

Center for Health, Environment and Justice, Child Proofing Our Communities Campaign (2001). *Poisoned schools: invisible threats, visible action*. Falls Church, VA: Center for Health, Environment, and Justice. Retrieved June 3, 2005, from www.childproofing.org/poisonedschoolsmain.html.

Children's Environmental Health Network. (1997). Glossary of Children's Environmental Health Terms. Retrieved December 8, 2005, from www.cehn.org/cehn/resourceguide/glossary.html.

Crain, E.F. (2000). Environmental threats to children's health: a challenge for pediatrics. *Pediatrics*, 106 (4 supplement), 871-875.

Gratz, R., & Boulton, P. (1993). Taking care of kids: a director's concerns about environmental hazards. *Daycare and Early Education*, 21(2), 29-31.

Greater Boston Physicians for Social Responsibility. (2000). *In harm's way: toxic threats to child development. Executive summary*. Retrieved August 8, 2002, from <http://psr.igc.org/ihw-project.htm>.

Harms, T., Clifford, R.M., & Cryer, D. (2004). *Early Childhood Environment Rating Scale-Revised*. New York: Teachers College Press.

Jahn, L., & Payne, S. (2002). *Pressure treated wooden playground equipment – what you need to know*. Raleigh, NC: North Carolina State University Recreation Resources Service. Retrieved June 3, 2005, from http://natural-resources.ncsu.edu:8100/rrs/cca_play.html.

Mott, L., Fore, D., Curtis, J., & Solomon, G. (1997). *Our children at risk: the 5 worst environmental threats to their health*. New York, NY: Natural Resources Defense Council. Retrieved June 13, 2005, from www.nrdc.org/health/kids/ocar/chap5.asp.

National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program, and School Asthma Education Subcommittee. (2002). *How asthma-friendly is your child care setting? Checklist*. Retrieved June 26, 2002, from www.nhlbi.nih.gov/health/public/lung/asthma/chc_chk.htm.

National Center for Healthy Housing. (2001). *Maintaining a lead-safe home: a do-it-yourself manual for home owners and property managers*. Retrieved August 24, 2005, from www.centerforhealthyhousing.org/html/maint_home_book.html.

National Pesticide Information Center. (2002). *Technical pesticide information: toxicology and active ingredient fact sheets*. Retrieved December 8, 2005, from http://npic.orst.edu/factsheets/air_tech.pdf.

- National Pesticide Telecommunication Network (2005). *Pesticide in indoor air of homes*. Retrieved December 4, 2005, from http://npic.orst.edu/factsheets/air_gen.pdf.
- National Training Institute for Child Care Health Consultants. (2003). *Environmental health in child care*. Chapel Hill, NC: National Training Institute for Child Care Health Consultants, Department of Maternal and Child Health, The University of North Carolina at Chapel Hill.
- Perinatal Outcomes Project (2004). *Live births, California, 2004*. Berkeley, CA: School of Public Health, University of California, Berkeley. Retrieved March 28, 2006, from <https://perinatalprofiles.berkeley.edu/>.
- Pew Environmental Health Commission. (1999). *Healthy from the start: why America needs a better system to track and understand birth defects and the environment*. Technical Report, Executive Summary. Baltimore, MD: Johns Hopkins University. Retrieved June 13, 2005, from <http://healthyamericans.org/reports/files/healthystart.pdf>.
- Ries, L.A., Smith, M. A., Gurney, J. G., Linet, M., Tamra, T., Young, J.L., & Bunin, G. R. (Eds.) (1999). *Cancer incidence and survival among children and adolescents: United States SEER Program 1975-1995*. Bethesda, MD: National Cancer Institute.
- Schneider, D., & Freeman, N. (2000). *Children's environmental health: reducing risk in a dangerous world*. Washington, D.C.: American Public Health Association.
- State of California, Health and Human Services, Department of Social Services. (2002). *Manual of policies and procedures, Community Care Licensing Division*. Child Care Center, Title 22, Division 12. Chapter 1. Chicago, IL: Barclays Law Publishers.
- Strategic Plan for Asthma in California (2002). Sacramento, CA: California Department of Health Services. Retrieved March 28, 2006, from http://www.ehib.org/cma/papers/strategic_asthma.pdf.
- Thompson, K. (2000). *Doing our best for children: a guide for evaluating hazard claims and setting priorities*. Boston, MA: Harvard Center for Risk Analysis. Retrieved July 22, 2000, from www.kidsrisk.harvard.edu/foradults.html.
- U.S. Department of Agriculture (USDA) Cooperative State Research, Education and Extension Services, USDA Natural Resources Conservation Services, U.S. Environmental Protection Agency. (2001). *Home*A*Syst. Help Yourself to a Healthy Home: Protect Your Children's Health*. Washington, DC. Retrieved November 1, 2001, from www.uwex.edu/homeasyst/text.html.
- U.S. Department of Health and Human Services. (2000). *Healthy People 2010*. Second Ed. Washington, DC: U.S. Government Printing Office. Retrieved November 1, 2001, from www.health.gov/healthypeople/Document/Word/Volume1/08Environmental.doc.
- U.S. Department of Housing and Urban Development. (1995). *The HUD guidelines for the evaluation and control of lead-based paint hazards in housing*. Retrieved August 25, 2005, from www.hud.gov/offices/lead/leadsaferule/index.cfm.
- U.S. Department of Housing and Urban Development, Office of Lead Hazard Control. (1999). *Lead paint safety*. Washington, DC: U.S. Department of Housing and Urban Development.
- U.S. Environmental Protection Agency. (2005). *Sunwise school program*. Retrieved December 5, 2005, from www.epa.gov/sunwise/summary.html.
- U.S. Environmental Protection Agency. (2005). *Children and drinking water standards*. Washington, DC: U.S. EPA, Office of Water. Retrieved December 4, 2005, from www.epa.gov/safewater/kids/kidshealth/index.html.

- U.S. Environmental Protection Agency. (2005). *State and regional contact information*. Retrieved December 8, 2005, from www.epa.gov/iaq/contacts.html.
- U. S. Environmental Protection Agency (2002). *Indoor Air – Schools. IAQ tools for schools kit – walkthrough inspection checklist*. Retrieved December 6, 2005, from www.epa.gov/iaq/schools/tfs/walkthrough.html.
- U.S. Environmental Protection Agency, Office of Children’s Health Protection. (2005) *Basic information about indoor air quality*. Retrieved December 8, 2005, from www.epa.gov/iaq/ia-intro.html.
- U.S. Environmental Protection Agency, Office of Pesticide Programs. (2002). *What is a pesticide*. Retrieved June 1, 2002, from www.epa.gov/pesticides/about.
- U.S. Environmental Protection Agency, Office of Pesticide Programs. (2005). *Insect repellent: DEET*. Retrieved December 8, 2005, from www.epa.gov/pesticides/factsheets/chemicals/deet.htm.
- U.S. Environmental Protection Agency, Office of Pesticide Programs. (2002). *Integrated pest management (IPM) in schools*. Retrieved June 23, 2002, from www.epa.gov/pesticides/ipm.
- U.S. Environmental Protection Agency, U.S. Consumer Product Safety Commission, Office of Radiation and Indoor Air. (1995). *The inside story: a guide to indoor air quality*. U.S. Environmental Protection Agency IAQ Publications. Retrieved May 24, 2001, from www.epa.gov/iaq/pubs/insidest.html.
- U. S. Environmental Protection Agency, Indoor Environments Division (2002). Montana State University Extension Service and USDA Cooperative State Research, Education and Extension Service. *Signs of possible home indoor air quality problems*. Retrieved April 17, 2002, from www.montana.edu/wwwcxair/hazards.htm#signs.
- Wiles, R., & Campbell, C. (1995). *Pesticides in children’s food*. Washington, DC: Environmental Working Group. Retrieved August 2, 2002, from www.ewg.org/reports/Baby_food/baby_home.html.
- World Health Organization (2005). *The environment and health for children and their mothers*. Fact sheet number 284. Retrieved August 14, 2005, from www.who.int/mediacentre/factsheets/fs284/en/index.html.

HANDOUTS FOR THE ENVIRONMENTAL HEALTH MODULE

Handouts from California Childcare Health Program (CCHP), Oakland, CA

Page	Handout Title
35	<i>Chemical Hazard Survey and Action Plan for ECE Programs</i>
37	<i>Health and Safety Notes: Anemia, Lead Poisoning and Child Care</i>
39	<i>Health and Safety Notes: Indoor Air Quality</i>
41	<i>Health and Safety Notes: Keeping Children Safe from Pests and Pesticides</i>
43	<i>Health and Safety Notes: Lead in Keys</i>
45	<i>Health and Safety Notes: Pets in the Child Care Setting</i>
47	<i>Health and Safety Notes: Recommendations for Cleaning, Sanitizing and Disinfecting</i>
49	<i>Health and Safety Notes: Summer Safety</i>
51	<i>Health and Safety Notes: The Use of Insect Repellent by Child Care Programs</i>
53	<i>Less Toxic Alternatives to Common Hazardous Household Products</i>
56	<i>No Smoking Poster</i>
57	<i>Survival Tips Poster: Sun Protection</i>

Handouts from National Training Institute for Child Care Health Consultants (2004)

Page	Handout Title
59	<i>Child Care Inventory for Air Pollution Hazards</i>
64	<i>Child Care Inventory for Water Pollution Hazards</i>
65	<i>Supplementary Materials on Environmental Topics of Special Interest to ECE Providers</i>

CHEMICAL HAZARD SURVEY OF ECE PROGRAM

(to be conducted annually)

Collect chemicals from various places in the ECE program, especially the rooms where children are present.

Name of Product	Manufacturer's Name and Telephone	Purpose of Product	Label Instructions <input type="checkbox"/> Warnings read <input type="checkbox"/> Child-safe (can be used around children)	MSDS <input type="checkbox"/> On file <input type="checkbox"/> Requested Date _____	Disposal <input type="checkbox"/> Keep <input type="checkbox"/> Stored properly <input type="checkbox"/> Alternative needed (see reverse)

NOTE: In accordance with the Health Insurance Portability and Accountability Act (HIPPA) and applicable California laws, all personal and health information is private and must be protected.

CHEMICAL HAZARD SURVEY AND ACTION PLAN

FOR ECE PROGRAMS

The federal Occupational Safety and Health Administration (OSHA) requires that employers inform staff about the presence of toxic substances including the presence of hazardous chemicals in the environment. The Illness and Injury Prevention Program must also include a safety and health survey that recommends: making a list of chemicals used in your workplace, obtaining a Materials Safety Data Sheet, and identifying where they are used. It is based on the premise that no employee should use chemicals without fully understanding their toxic properties and without the knowledge required to work with them safely. The survey and action plan provides a way to fulfill the requirement.

Complete the Child Care Chemical Hazards Survey and Action Plan according to the following directions:

1. Identify one lead person to conduct the survey for the facility, who will also be responsible for on-going communication in regards to chemical safety throughout the year. All staff can participate in collecting the chemicals they use to share with the lead person. This includes, kitchen staff, janitors, bus drivers, and administrative personnel.
2. Document the name of the product, the manufacturer's name, and their toll free 800 phone number from the label—used to contact for a Material Safety Data Sheet (MSDS) on the product. NOTE: If you cannot find the phone number consider discarding the product.
3. Describe the purpose for which the product is used in the child care facility. Are there several products used for the same purpose, e.g. cleaning? If so, consider narrowing the number of products to those that are the least hazardous, serve multipurpose functions, and are easy to purchase so the staff will always be familiar with their safe use.
4. Review the label for warnings about safe use especially around children, and for precautions to take while using the product. Record that the instructions and warnings have been reviewed and whether the product is child-safe. Eliminate products that seem too hazardous to use. If there are no label warnings consider discarding the product. If you have any questions about the warnings and/or instructions, contact the manufacturer for further information.
5. Indicate that a request for an MSDS sheet from the manufacturer has been made, if the product is determined acceptable and will be kept and used. Maintain a copy of the MSDS for every product being used on file at all times and also be available near the point of use.
6. Review the MSDS information to decide whether to 1) keep the product, 2) dispose of safely, or 3) seek an alternative. Document which choices were selected.

The MSDS contains information about the product including ingredients, health hazards, proper safety gear and handling, and physical hazards such as flammability. Always store chemicals well away from food products and supplies. Examples of protective gear listed on a MSDS may include utility gloves, safety goggles, and a plastic apron, used when mixing a dilute chlorine bleach solution, commonly used and recommended as a sanitizer in child care programs. The following resources may help you make your child care program safer for staff and children.

by Judith Calder, RN, & Mardi Lucich, MA, 2004

- Cal/OSHA Consultation Service. 2002. Guide to Developing Your Workplace Injury and Illness Prevention Program, available online at: www.dir.ca.gov/dosh/dosh_publications/iipp.html.
- Less Toxic Alternatives to Hazardous Household Cleaning Products (CCHP Handout, 2004).
- Children's Environmental Health Network, online at: www.cehn.org.



Anemia, Lead Poisoning and Child Care

Childhood Lead Poisoning

Lead poisoning is the most common environmental disease affecting children in our country today. While some lead naturally occurs in the earth's soil, our bodies have no use for it: in fact, it is toxic in any amount in our bodies. We have released lead into our environment by adding it to gasoline, paint, pottery and some industrial processes. Homes and buildings built before 1978 will almost certainly contain some lead-based paint.

Lead poisoning can cause serious health problems for children. It can slow their growth, cause learning disabilities and behavioral problems, and damage major organs such as the kidneys and brain.

Children between the ages of one and six years are most at risk for lead poisoning. Because young children often put their hands and toys in their mouths, they can swallow lead that gets on their hands and toys from dust, dirt and chipping paint.

Lead-based paint is not the only source of lead inside homes and child care programs. Lead can also be found in common household items such as pottery, home medical remedies, cosmetics, imported food products and candies, cans with lead-soldered seams, toys, mini-blinds and other products made of vinyl.

Children at risk for lead poisoning should have a blood lead test. This is the only way to find out if a child has lead poisoning. We don't really know how many children are lead poisoned because so few children are tested. However, all insurance plans pay for the test.

Parents can ask their child's medical provider to perform a lead test.

Child care providers can test their program for paint and products containing lead.

Source: Childhood Lead Poisoning Prevention Branch, California Department of Health Services

Lead poisoning can cause anemia.

Anemia makes it easier for lead to get into the blood.

Lead poisoning and anemia are both detected by a blood test.

Lead poisoning and anemia are both preventable.

Practice good nutrition and proper handwashing to help prevent lead poisoning and iron deficiency anemia.

Iron Deficiency Anemia

We need iron to keep our blood strong. Low levels of iron in a child's blood can make the child pale, tired, cranky, eat poorly, get sick more easily, get more infections, and have trouble learning.

Iron is a mineral found in some foods. Eating foods that are high in iron can help keep children healthy and feeling well.

Dairy products like milk, cheese, yogurt and ice cream are very low in iron. They are good for bones and teeth because they have a lot of calcium, but drinking too much milk can contribute to anemia. The milk fills the child up and he or she doesn't eat enough food high in iron. Babies should be weaned from the bottle by about 1 year of age. At this age, they should drink only 2 to 3 cups of milk per day (16 -24 oz).

Infants and children should have their blood tested for iron-deficiency anemia. Anemia can be prevented and mild cases can be reversed by eating diets high in iron.

Vitamin C helps the body use iron, so combine foods high in iron and vitamin C in meals and snacks.

Some foods high in iron

Beef, pork, liver, fish cooked beans, tofu, iron-fortified cereals, enriched tortillas and breads, leafy greens, dried fruit and prune juice.

Some foods high in vitamin C

Broccoli, cabbage, cauliflower, tomatoes, potatoes, bell peppers, oranges, melon and strawberries.

Serve children foods high in iron and vitamin C, and cook in iron pots.

Source: WIC Supplemental Nutrition Branch, California Department of Health Services

California Childcare Health Program • 1333 Broadway, Suite 1010 • Oakland, CA 94612-1926
Telephone 510-839-1195 • Fax 510-839-0339 • Healthline 1-800-333-3212 • www.ucsfchildcarehealth.org



Indoor Air Quality



When we think of air pollution, it is important to consider the air that is inside of our homes, workplaces, and other buildings. The Environmental Protection Agency has found that indoor air is two to five times more polluted than outdoor air, and considers contaminants in indoor air among the top five environmental risks to public health. Indoor air contaminants may have adverse effects on the health and comfort of infants, toddlers, preschoolers and the staff who care for them. Many health problems can be triggered by polluted air.

Young children and indoor air pollution

Young children are especially vulnerable to indoor air pollution. The same concentrations of pollutants can result in higher exposures to children because they breathe more air in proportion to their body weight than adults. Also, since children are growing and developing, the potential for damage to their respiratory and neurological systems is greater.

What are the health risks?

Some short-term health problems that may result from indoor air pollutants are headache, nausea, dizziness, infection and irritation of the eyes, nose and respiratory tract. Possible chronic and long-term effects include asthma, allergies, lung disease, cancer, and neurological damage.

What causes indoor air pollution?

- biological contaminants such as mold, dust mites, pet dander and cat saliva, pollen, rats and mice, cockroaches, bacteria and viruses
- gas stoves, wood stoves and kerosene heaters
- solvents, cleaning agents, air fresheners, cosmetics and perfumes
- dust from lead paint
- off-gassing of chemicals found in furnishings and consumer products such as carpeting and

upholstery, wood finishes, rug and oven cleaners, paints and lacquers

- art supplies such as glues, paints, dry erase markers and pens
- pesticides
- radon
- tobacco smoke and second-hand smoke

How can we reduce indoor air pollution?

Remove the source of the pollutant. Source control is the most effective, economical and time-efficient way to address indoor air quality.

Control moisture in the environment. Moist vapor, standing water and water-damaged materials are a breeding ground for mold, mildew, insects and bacteria. Prompt attention to moisture problems is essential to reduce the risk of adding contaminants into the air.

Provide ventilation. Ventilation means supplying outdoor air to the areas that are occupied by children indoors. Opening windows and safely using fans will provide ventilation. Windows should open no more than four inches and fans should not be accessible to children. When windows cannot be opened, rooms should be ventilated by a system that circulates air from outdoors. State laws set standards for the amount of fresh air that should enter the building during operation of the heating, ventilation, and air conditioning systems (HVAC). HVAC systems should be inspected to ensure that the vents that allow mixing of outdoor air are open. Failure to open the vents is common and results in unsafe indoor environments.

Maintain and inspect heating and air conditioning systems. Never burn charcoal indoors. Fireplaces, furnaces, gas heaters, air conditioners and ventilation systems need to be clean, dry and in good

repair. Filters should be changed regularly. Make sure that vents in HVAC systems are open.

Review custodial and housekeeping practices. Vacuum and damp mop for dust which may contain lead, dust mites, pesticides and other contaminants. Use proper dilutions for cleaning products and use products only for their intended purpose. Read labels and buy the least harmful product available. Products labeled “warning” or “caution” are less harmful than those labeled “poison” or “danger.” Choose cleaning products with fewer fumes such as baking soda and vinegar. Avoid products in aerosol sprays. Don’t use air fresheners—they do not improve air quality and use artificial chemicals.

Equip craft areas properly. Use art supplies such as glues and paints outside or in ventilated areas. Do not use materials that create toxic fumes or gases. Read the labels, as they are required to identify hazardous ingredients. Don’t store open, unused paints and craft materials. Supervise children closely.

Use pesticides only as a last resort. Use Integrated Pest Management (IPM) rather than spraying pesticides (for more information see *Health and Safety Note: Keeping Children Safe from Pests and Pesticides*). Consult a specialist who is familiar with IPM.

What are useful policies for promoting indoor air quality?

Written policies show you are committed to providing a healthy child care setting and help avoid confusion when communicating with parents and staff. Communication about environmental issues is essential between caregivers, parents, grounds keepers, custodial staff and maintenance contractors. Policies may address:

- **Painting, renovations and repair.** Schedule these activities for times when children are not present. Test all painted surfaces for lead before painting. Choose licensed professionals with experience in dealing with lead paint and proper disposal of debris. Volunteers, although well meaning, are often not aware of the environmental risks to young children.
- **No smoking.** This includes all adults. Adults who live in the home of a family child care program as well as parents, relatives and staff should be aware of this policy.
- **Pest management.** Use IPM techniques.

- **Ventilation.** Arrange your space to provide adequate ventilation to high-need areas such as arts and crafts areas and diaper changing areas. Install window guards for safety. Regularly inspect and maintain HVAC systems.
- **School supplies and purchasing choices.** Purchase least toxic supplies. Install new products such as carpeting and furniture when children are not present, and provide ventilation for 48 to 72 hours after installation. (AAP, 2003) Choose low emission products.
- **Sanitizing and cleaning products.** Decide what products you will use for cleaning and sanitizing. Keep products in their original containers. Keep all chemicals out of the reach of children.
- **Pets.** Determine if you will allow pets in your program. Confine pets to a limited area that is easily cleaned.

Are air purifiers helpful?

Many products are sold as air purifiers. Ozone generators purposely introduce ozone into the air. Ion generators may introduce ozone into the air as a byproduct. Ozone can be harmful to children, so these devices are not recommended. Air filtration systems, if properly maintained, can be used as an adjunct to source control and adequate ventilation. Effective control at the source of pollution remains the most important step in maintaining air quality. (AAP, 2003)

Resources and References

California Air Resources Board, *Indoor Air Pollution in California*, July 2005. www.arb.ca.gov/research/indoor/ab1173/ab1173htm.

American Academy of Pediatrics, Committee on Environmental Health. (2003). *Pediatric Environmental Health*.

American Academy of Pediatrics, American Public Health Association, & National Resource Center for Health and Safety in Child Care. (2002). *Caring for Our Children: National Health and Safety Performance Standards: Guidelines for Out-of-Home Child Care Programs*, Second Edition.

United States Environmental Protection Agency. (2000). *Indoor Air Quality: Tools for Schools*. www.epa.gov/iaq.

American Lung Association. (1999). *Indoor Air Pollution Fact Sheet*. www.lungusa.org.

California Childcare Health Program. (2001). *Pets in the Child Care Setting*.

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Keeping Children Safe from Pests and Pesticides

California State Licensing regulations for child care state that child care settings should take measures to be free from rats and insects. The national standards in *Caring for our Children* tell us that the potential health hazards to children caused by the presence of pests should be reduced. What does this mean to the child care provider? Since pesticides can also pose a health threat to young children, finding ways to reduce or eliminate exposure to pests while reducing or eliminating exposure to pesticides is an environmental concern that every early care and education professional needs to address.

Why control pests in child care?

Diseases that are spread by insects and rodents can be passed to young children. Normal behaviors in young children such as crawling, mouthing toys and other objects along with natural curiosity and exploration make toddlers particularly vulnerable to diseases carried by pests. Common pest-related hazards in child care settings include:

- Flies and cockroaches may spread disease.
- Mosquitoes may carry disease.
- Cockroaches can cause allergies and asthma attacks.
- Yellow jacket stings are painful and can be life threatening to those with allergies.
- Spiders may inflict painful bites and some may pose a health risk.
- Mice and rats may contaminate food, trigger asthma attacks, carry disease and cause structural damage to buildings, pipes and electrical wiring.
- Termites cause structural damage to buildings and wood furniture.

Why are children vulnerable to pesticide exposure?

The behaviors that make young children vulnerable to diseases carried by pests (crawling, mouthing

toys, etc.) can also expose children to the pesticides that have been applied to control pests. Pound for pound, children eat, drink and breathe more than adults. Thus, if pesticides are in their environment, they can have higher exposures than adults. Combined with the fact that their brains, immune systems and organs are immature and still developing, children can suffer both short-term and long-term health problems from pesticide exposure.

What health risks are associated with pesticide use?

With the exception of poison baits, as little as 1 percent of pesticides applied indoors reach the targeted pest (AAP, 2003). As a result, pesticide residues are left on surfaces and in the air of the treated building. Outdoor application of pesticides may fall on non-targeted organisms, outdoor furniture and play areas and be tracked indoors. Acute symptoms such as nausea, headache, dizziness and respiratory irritation may occur from exposure to pesticides. Studies have shown that children who are exposed to pesticides also have a higher incidence of chronic health problems such as neurological disorders, leukemia and other cancers and have a greater risk of developing asthma (IPM Institute, 2004).

Integrated Pest Management

Integrated Pest Management (IPM) is a pest control program that minimizes pesticide exposure. Despite the convenience and availability of pesticides, there are many ways to control pests without the use of chemicals. IPM controls pests by combining biological, mechanical, cultural, physical and chemical methods in a way that minimizes health and environmental risks. IPM provides the least toxic alternative. It is based on inspection and knowledge of the pests' biology and habits to determine the methods that would best control the pests with the lowest possible exposure to pesticides. Chemicals

are only used as a last resort. IPM is endorsed and promoted by the Environmental Protection Agency.

Why are education and communication important?

The common sense strategies of IPM require the combined efforts of teachers, kitchen staff, parents, custodians and groundskeepers. Education and communication are essential to promote the necessary changes in habits and attitudes. A licensed IPM professional can suggest the best strategies for controlling pests in your child care setting.

Cultural controls and sanitation. Modify the activities in the child care facility to make the environment less hospitable to pests.

- Restrict food consumption to certain areas.
- Empty trash cans at the end of the day rather than letting them sit over night.
- Store food in containers with tightly fitting lids.
- Clean dishes, utensils, and surfaces soiled with food as soon as possible after use and at the end of each day.
- Clean garbage cans and dumpsters regularly.
- Collect and dispose of litter daily.

Physical controls. Use barriers or other materials to exclude pests from an area.

- Caulk cracks and openings.
- Fill in access holes in walls.
- Seal around electrical outlets.
- Use trash cans with tightly fitting lids.
- Empty and thoroughly clean cubbies and storage areas at least twice a year.
- Reduce clutter in which pests can hide.
- Keep vegetation, shrubs and wood mulch at least one foot away from structures.
- Keep window and door screens in good repair.
- Use physical traps. Be aware that in the child care setting, traps can be a hazard and must be placed out of reach of children. This includes sticky traps, snap traps and fly traps.

Biological controls. Identify the problem or pest before taking action.

- Look for the root of the problem, not just the symptoms of a pest problem.
- Inspect and monitor pest populations.
- It is very important to reduce pests' access to food, water and shelter.

Chemical controls. As a last resort, the careful use of pesticides may be necessary.

- Always use a licensed professional with experience in IPM when applying chemicals.
- Use bait, traps or gels in cracks, wall voids, and in spots that are out of reach of children. Avoid sprays, powders and "bomb" applicators.
- Schedule pesticide application for times when the building and grounds are not occupied.
- Use spot treatments as needed, rather than area-wide applications or regularly scheduled applications.
- Store all chemicals in a locked cabinet.

Attitude Adjustment

Increase your tolerance for pests that are just a nuisance and don't spread disease. To control these pests, always make use of non-chemical strategies first. Pests that do not pose immediate health threats but are a nuisance include:

- **Weeds** may invade playing fields or playgrounds or be aesthetically unpleasing. Pull by hand.
- **Ants** may gather in eating and play areas. Keep areas clean. Use non-toxic alternatives.
- **Fruit flies** may appear in kitchens. Keep food and garbage covered.
- **Meal moths** may infest food storage. Dispose of infested food. Store food in containers with tightly fitting lids.
- **Head lice** may appear on children. Have parents consult their health care provider for treatment.

References and Resources

IPM Institute. 2004. *IPM Standards for Schools: A Program for Reducing Pests and Pesticide Risks in Schools and Other Sensitive Environments*. www.ipminstitute.org/school.htm.

American Academy of Pediatrics, Committee on Environmental Health. 2003. *Pediatric Environmental Health*.

U. S. Environmental Protection Agency. 2005. *Integrated Pest Management in Schools*. www.epa.gov/pesticides/ipm.

Pest Control Operators of California. 2005. *Integrated Pest Management*. www.pcoc.org.

Safer Pest Control Project. 2005. *Safer Pest Control for Child Care Centers: How to Implement and Integrated Pest Management (IPM) Program at Your Facility*. www.spcpweb.org.

Statewide IPM Program University of California, Davis. 2005. www.ipm.ucdavis.edu.

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Lead in Keys

The role of child care providers in preventing lead poisoning

Lead poisoning is the most common environmental disease of young children from birth to 6 years of age and it is preventable. As a child care provider, you are in an ideal position to protect children from lead poisoning and to educate parents about the issue. There are more than 800,000 children under 6 years of age in licensed child care in California. Parents look to you to help keep their children safe and healthy.

There are many simple steps that you and parents can take to ensure that the children in your care are safe from lead poisoning. The biggest source of lead exposure for children is from old chipping house paint. Keeping lead out of the home and child care environment is one of the most important things you can do to protect children. Making sure that children wash their hands frequently and get good nutrition are also important.

What are the symptoms of lead poisoning?

Unfortunately, symptoms of lead poisoning do not appear until the child is very sick. They include problems with learning and paying attention, and damage to the brain, nerves and kidney. Because most children with lead poisoning do not look or act sick at first, the only way to know for sure if a child has lead poisoning is for him or her to have a blood test. Parents and caregivers of children 6 months to 6 years of age should request information about lead poisoning and a blood test if appropriate at health care visits. All children in publicly supported programs such as CHDP, Medi-Cal and Healthy Families should be tested at 12 and 24 months. Other children who live or spend time in housing built before 1978 that has chipping paint or has recently been remodeled should also be tested.

Why are young children more at risk for lead poisoning?

Children are at risk for lead poisoning for many reasons:

- They explore their environment by putting toys, hands and other objects in their mouths.

- They spend a lot of time on the floor where sources of lead are likely to be found. Through normal play, children come in contact with deteriorating paint, paint chips, keys, soil and dust, which may contain lead.
- Young children absorb more of the lead they eat because they have more rapid metabolisms.
- Young children's rapidly developing brains are more vulnerable to the toxic effects of lead. These toxic effects can cause behavioral changes and can limit their intellectual and physical development.

Lead exposure can also be harmful to the developing fetus, so pregnant women should protect themselves from exposure as well.

Lead in brass keys

A recent study identified a new potential source of lead: brass keys.¹ Most brass house and car keys contain lead, because brass is a soft metal and lead is used to strengthen the key so that it will not break or bend. Brass has a yellow color, but when it is used in a key it is often covered over by nickel or a nickel-plating, making it difficult to be certain whether a key is brass and therefore is likely to contain lead.

Not all keys have lead in them, but it is difficult to tell which keys do and do not contain lead just by looking at them. For this reason, children should never be given any keys to play with.

As a result of this study, key manufacturers agreed to reduce the amount of lead in brass keys to a level that would not be a problem for adults who are handling the keys in a normal way, such as driving their cars or opening doors. However, because children often put things in their mouths and because they are at risk for lead poisoning for the reasons listed above, it is recommended that **no keys should ever be given to children to play with.** The study showed that if there is lead in the keys, the children can get lead in their bodies by putting the keys in their mouths, or by putting their hands in their mouths after playing with the keys.

Other sources of lead

There are a number of other potential sources of lead in a child's environment. The more sources of lead children are exposed to, the higher their risk of being poisoned, so it is extremely important to minimize all possible exposures.

- **Lead-based house paint** is the most common source of childhood lead poisoning. Buildings constructed before 1950 are very likely to have high levels of lead in the paint. Those built between 1950 and 1978 are likely to have some lead in the paint. In 1978, the amount of lead in paint was limited by law, so buildings constructed after that are less likely to be a problem.
- **Lead gets in the soil** from leaded paint breaking down to dust or chips or from leaded gas emissions. Lead is no longer included in gasoline, but some remains in the soil from car exhaust in the air. Contaminated soil is also a very common source of childhood lead poisoning.
- **Lead can be brought home on work clothes** if household members work with lead. Some examples of these jobs include radiator repair, making or fixing batteries, soldering, and home remodeling.
- **Some home-made remedies and cosmetics** such as Azarcon, Greta, Pay-loo-ah and Kohl contain lead.
- **Hand-made pottery or dishes** sometimes contain lead; test them with a kit from the hardware store.
- **Some hobbies** require the use of lead, including making stained glass or fishing sinkers.

What can child care providers do to protect children from lead poisoning?

- Teach parents what you know about lead poisoning. Share this new information about lead in brass keys.
- Encourage children to wash their hands before eating, after toileting or playing outside, and before going to sleep to help keep lead from getting into their bodies.
- Make sure that children in your program are getting plenty of nutritious food. Good nutrition helps prevent lead that is ingested from being absorbed. Nutrients such as calcium and iron can help prevent absorption, and so does a full stomach.
- Request that children be assessed for lead poisoning as part of your pre-admission requirements.
- Post and distribute information about lead poisoning.

- Make sure your own facility does not expose children to lead by following the guidelines below.

How can I make sure there is no lead in my child care program?

Your facility may have lead in the paint or soil, or have toys or dishes with lead in them. Here are some ways to see if there is any lead in your child care environment:

- Have your facility's paint and soil tested for lead. You can get the names of inspectors by contacting your local county lead poisoning prevention program or the state program. You can also test painted surfaces yourself, with testing kits sold at hardware stores. Call the Lead Program of your local Health Department for instructions on how and where to do your own testing.
- Take precautions before painting, building or renovating in your facility. Lead paint must be carefully removed, and you should consider hiring a lead abatement contractor to do so. Do not sand, scrape or burn lead-based paint. Children, pregnant women and pets should not be present during renovation.
- Cover bare soil around your facility. You can plant shrubs or grass so that children are not playing directly on the dirt. If you use well-maintained, impact-absorbing surfaces under play equipment, they will protect children from lead in soil as well as from falls.
- Wash mouthed toys frequently. Test old or imported painted toys for lead; if they test positive, don't use them.
- Inspect your facility for peeling or flaking paint and test to see if it contains lead. Keep cribs, playpens and other play equipment away from the area.
- Clean and disinfect all play surfaces on a regular basis to remove not only dirt, debris and body fluids, but lead paint dust.

Reference

¹*People v. Ilco Unican Corp.*, Case No. 305765 (Super. Ct. S.F.), Decl. of Jeffery M. Paull, Dr.P.H., September 8, 2000.

Resources

California Childcare Health Program at (800) 333-3212 or visit the Web site at www.childcarehealth.org

Call the lead poisoning prevention program of your local health department (look for Health Department in the local government listings of the phone book).

State of California Lead Poisoning Prevention Program at (510) 622 5000 or www.dhs.ca.gov/childlead.

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Pets in the Child Care Setting

Many child care providers who care for children in their homes have pets, and many centers include pets as part of their educational program. Pets can be excellent companions. They meet the emotional needs of children and adults for love and affection. Caring for pets also gives children an opportunity to learn how to be gentle and responsible for others. Contact with pets can be fun and teach children about life, death and unconditional love. However, child care providers need to know about potential health and safety risks before making the decision to keep pets in child care.

What are the health and safety risks?

Allergies: Many children are allergic to animals and may have symptoms when they are around them. About 25 percent of allergic people are sensitive to dogs or cats, and cats generally cause more allergy problems than dogs. A child who is allergic to dogs or cats may also be sensitive to other common pets such as rabbits, guinea pigs or hamsters.

Injuries: Dog and cat bites are the most reported types of injuries caused by pets. The tearing and puncture wounds they produce can also cause infections.

Infections: Certain animals carry viruses, bacteria and other potential infections that can be passed on to people. Diseases that can be transmitted from animals to people are called zoonotic diseases. Zoonotic diseases can spread through direct contact with infected animals or their stool, insects that bite or live on animals, and infections that live in the environment where the animal lives.

What are some diseases we can catch from animals?

Salmonellosis: This disease is caused by salmonella bacteria and transmitted to humans by eating food contaminated with the feces of an infected pet. Many animals, such as chickens, iguanas, geckos and turtles are carriers of salmonella, but do not appear ill themselves.

Rabies is usually a viral infection of wild animals such as raccoons, skunks, bats and foxes, but can spread to domestic animals and humans by a bite or scratch.

Diarrhea can be caused by *Campylobacter* and parasites such as giardia, and is associated with infected dogs, cats, birds and farm animals.

Cat-scratch disease causes fever and swollen glands, and is usually transmitted by kittens.

Ringworm is a fungal skin infection which can be spread from dogs, cats, rabbits and guinea pigs.

Toxoplasmosis can affect anyone, but is very dangerous to unborn babies, causing birth defects. Humans catch this illness through contact with cat waste.

Psittacosis, an illness like pneumonia, can be transmitted by infected parrots and other exotic birds.

Who is at higher risk?

Pregnant women, infants, the elderly and people with weak immune systems such as those born with inherited immune deficiencies, AIDS/HIV and those receiving chemotherapy, are at higher risk of catching zoonotic diseases.

Which animals are not appropriate?

Some pets, particularly exotic pets such as iguanas, turtles, snakes, spiders and tropical fish may not be appropriate for the child care setting. Aggressive dogs especially hybrid wolf-dogs that have become increasingly popular in recent years, are potentially dangerous to humans, including their owners. Check with a veterinarian if you are unsure whether a particular pet is appropriate for children, and check with the local health department for regulations and advice regarding pets in child care. Venomous or poisonous animals are not appropriate for young children to handle under any circumstances.

What can you do to protect the health and safety of children?

To minimize the health and safety risks associated with pets, child care providers can take the following steps:

Reduce the risk of allergy problems

- If your child care setting has a pet, tell parents before they enroll a child, in case allergies may require the parents to make other child care arrangements.
- Do not bring animals into rooms used by children whose asthma is triggered by animals.
- To control allergy risks, confine the pets to a limited area that you can clean easily. Keeping the animal clean and brushed helps, too.

Protect children from injury and bites

Children commonly treat animals as if they were humans. They may hug or hit them or expect them to behave like another child and cause an aggressive response. These expectations increase when they observe that adults give animals human-sounding names, treat animals like people and tell stories about animals that act like humans. To prevent injuries:

- Before bringing and introducing any animal, learn about the usual behavior of that type of animal and get to know the individual pet. Since children's behavior can threaten an animal, be sure you know how the animal behaves when frightened.
- Make sure that children are introduced to pets in a quiet, controlled setting.
- Teach children how to behave around pets. They need to learn not to feed or provoke the pet, and that removing the pet's food or disturbing a sleeping pet upsets them. Always keep their faces and fingers away from a pet's mouth, beak or claws.
- All pets, whether kept indoors or outside, must be in good health, show no evidence of disease, and be friendly toward children.
- Child care providers must be present when children play with animals. Be ready to remove a child immediately if an animal shows signs of distress or the child treats the animal inappropriately.
- Keep pet food and dishes out of children's reach.
- Do not let children pet an animal that is in a cage, pen or tied up. Children should not put their fingers through openings in a cage.

- Do not let children interact with a mother animal or her babies while she is with them.

Prevent infections

- Children and providers should wash their hands after contact with any animal, its belongings or cage.
- Dogs or cats should be appropriately immunized (check with the veterinarian) and be kept on flea, tick and worm control programs. Proof of immunizations should be kept in a safe place.
- Keep your pets clean. Dogs and cats use their tongues to clean themselves, so try to discourage pets from licking the children and vice versa.
- Keep pet living quarters clean; dispose of pet waste immediately. Litter boxes should never, ever be accessible to children. Keep children away from areas where animals urinate.
- Keep sandboxes covered when not in use to prevent pets from using them as litter boxes.
- Pregnant providers should avoid contact with cat feces; someone else should dispose of cat litter daily.
- Teach children to avoid wild animals when taking hikes, walks or field trips.

What should you do if an animal bites a child in your care?

- Remove the animal to a secure setting away from children.
- Notify parents at once.
- Get medical help immediately if the wound is large, deep or bleeding heavily.
- Use disposable gloves and wash the wound thoroughly with soap and water.
- Control bleeding, elevate the body part that was bitten, and apply a clean bandage.

References

Prevention of Infectious Disease, California Childcare Health Program, 2001.

Early Childhood Health Link, American Academy of Pediatrics.

Pets and Kids, Susan S. Aronson, MD.

The ABCs of Safe and Healthy Child Care, The Centers for Disease Control and Prevention (CDC).

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Recommendations for Cleaning, Sanitizing and Disinfecting

Illnesses may be spread in various ways, such as by coughing, sneezing, direct skin-to-skin contact, and by touching an object or surface with germs on it. Germs causing infection may be present in human waste (urine, stool) and body fluids (saliva, nasal discharge, drainage from lesions or injuries, eye discharge, vomit and blood).

Infected persons may carry communicable diseases without having symptoms, and they may be contagious before they experience symptoms. Child care staff need to protect themselves and the children by routinely cleaning and disinfecting exposed areas. Gloves should be worn when cleaning up blood, and hands should be washed any time body fluids are touched. Since children will touch any surface they can reach, all surfaces may be contaminated. Therefore, all surfaces must be properly cleaned and sanitized.

Cleaning

Prior to using a bleach solution to sanitize, remove dirt and debris such as blood, urine, vomit, stool, food, dust or fingerprints by scrubbing and washing with detergent and rinsing well with water.

Routine cleaning with an all-purpose liquid detergent or abrasive cleanser gets rid of the dirt you can see. Scrubbing physically reduces the number of germs on surfaces (as when we wash our hands). Use a disposable cloth or one that can be washed after each use, so that you don't

move germs from one place to another. Sponges are not recommended as they harbor bacteria and are difficult to clean. Some items and sur-

faces should receive an additional step, *disinfection*, to kill germs **after** cleaning with detergent and rinsing with clear water.

Carpeting should be vacuumed daily (when children are not present) and shampooed at least every three months. Carpets should be cleaned monthly in infant areas. Carpet cleaning must be done when children are not present to avoid fumes and allow the carpet to dry. Use a cleaning method approved by the local health authority.

Do not mix household bleach with other household chemicals such as toilet cleaners, rust removers, acids or products containing ammonia.

Mixing these chemicals with bleach will produce harmful gases.

Sanitizing or disinfecting

After cleaning, you can eliminate virtually all germs left on surfaces through the use of a chemical, such as a germicide or chlorine, or a physical agent such as heat.

In the child care setting, a solution of 1/4 cup household liquid chlorine bleach added to 1 gallon of cool tap water (or 1 tablespoon bleach to 1 quart of water) prepared fresh daily is an effective disinfectant. Disinfecting with bleach is **NEVER** effective unless the surface has been thoroughly cleaned first.

Apply disinfectant solution by spraying from a spray bottle, wiping with a cloth rinsed in disinfectant solution, or by dipping the object into

Area	Clean	Sanitize	Frequency
Countertops/ tabletops, floors, doors and cabinet handles	X	X	Daily and when soiled
Food preparation and service surfaces	X	X	Before and after food activity; between prep of raw / cooked foods
Cribs and crib mattresses	X	X	Weekly, before use by a different child and when soiled or wet
Utensils, surfaces and toys that go into the mouth or have been in contact with saliva or other body fluids	X	X	After each child's use, or use disposable, one-time utensils or toys
Toilet bowls, seats and handles, door knobs, floors	X	X	Daily or immediately if soiled
Hand washing sinks, faucets, surrounding counters, soap dispensers, door knobs	X	X	Daily and when soiled
Changing tables, potty chairs (use of potty chairs in child care is discouraged because of high risk of contamination)	X	X	After each child's use

the solution. Allow object or surface to air dry for at least two minutes before wiping it and/or using it again.

Hand-washed dishes must **always** be cleaned and disinfected after each use using bleach water only. *Pacifiers and manipulatives* can go in the dishwasher in a mesh bag on the upper level and heat dried to be disinfected. Items that can go through the dishwasher or washing machine cycle are disinfected if the water is hot enough to kill the germs (160° F). *Washable cloth toys* and other items can be machine-washed and machine heat-dried.

Household bleach with water is recommended because it is effective, economical, convenient and readily available. However, to avoid fumes, corrosion and color loss on some surfaces, you may look for a commercial product which is a "quaternary ammonium" and dilute according to the label instructions. Some of the newer products have a detergent in them and can be used to clean and disinfect in one step **if** there is no gross contamination with food particles,

meat juices, blood or dirt. If these are present, cleaning first is still required.

Good ventilation is always important, especially in enclosed areas (such as bathrooms) and where chemicals are stored. Chemical air fresheners may cause nausea or allergic responses in some children and should never be used.

Note: We urge our readers to obtain more comprehensive information on cleaning and disinfection from "Caring for Our Children" and from the CCHP *Prevention of Infectious Disease Curriculum*.

References

American Public Health Association and American Academy of Pediatrics, *Caring for Our Children, National Health and Safety Performance Standards: Guidelines for Out-of-Home Child Care Programs*, Washington, D.C., 2002.

by Gail D. Gonzalez, R.N., *Child Care Health Consultant, August, 1999 (Revised 02/05)*

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Summer Safety

Long summer days unfortunately bring with them an increased risk of injuries as children spend more time outdoors in active play and often receive less supervision. The American Academy of Pediatrics recommends that you take the following precautions to make sure the children in your care are safe.

Protect them from the sun

Don't rely on sunscreen alone to protect children from skin cancer. The best line of defense is a combination of protective clothing, hats with a broad brim, and sunglasses (look for sunglasses that block 99 to 100 percent of ultraviolet rays). Use sunscreen with a sun protection factor (SPF) of at least 15; apply 30 minutes before going outdoors and reapply frequently. Avoid sun exposure between 10 a.m. to 4 p.m. Infants under 6 months of age should be kept out of direct sunlight; and never leave infants to play or sleep in the sun.

The 2002 *Caring for our Children: Guidelines for Out-of-Home Child Care Programs* (2nd Ed.) recommends that all medications, including sunscreen, should only be used with a health care provider's recommendation. A physician or nurse practitioner may write a standing order for sunscreen, such as "With parental consent, children may have sunscreen applied to exposed skin, except eyelids, 30 minutes before exposure to the sun and every two hours while in the sun. Sunscreen preparations shall be applied according to the instructions provided by the manufacturer."

Child care providers may wish to request permission to use one particular brand of sunscreen on all children, rather than each child using a separate sunscreen brought from home. Parents need to test the sunscreen on their children's skin *at least once* before it is used in child care to make sure the child does not have an adverse reaction to it while in child care. Sunscreen should be stored out of reach of children.

Prevent heat stress

Make sure children drink plenty of water before any strenuous activities, and periodically while they are exercising, even if they don't feel thirsty. When the weather is warm, pick activities that are not too strenuous for the temperature and humidity, and make sure children are dressed in light-colored and long-sleeved lightweight clothing. Do not let young children stay in the sun for long periods, even when wearing sunscreen. Consider placing a canopy or shade tent in one section of your outside play area, so that activities can take place in the fresh air but in the shade.

Be safe around water

Never leave children alone in or near the pool, even for a moment. Even shallow wading pools pose a drowning danger to very young children. Make sure staff members can swim and are trained in lifesaving techniques and CPR. An adult should be within arm's length whenever infants or toddlers are in or around water.

Protect children from insects

- Wear light-colored clothing with long sleeves and legs. Tuck shirts into pants and pants into shoes/socks and boots.
- Prevent insects from entering indoors by fixing or installing window or door screens.
- Avoid areas where ticks are known to occur, and stay on trails if you go to these areas. Examine children frequently for ticks and remove any ticks promptly.
- Avoid places where mosquitoes breed and live, such as areas with standing water or thick, wet grass. Drain and discard any receptacles on your premises where water can collect.
- Don't use scented soaps, perfumes or hair sprays on children or dress them in bright flowery prints, as these may attract bees and wasps.

- The most effective insect repellents contain DEET; when using them, follow the directions on the label carefully. Use the appropriate concentration for the amount of time you will be exposed. Never use insect repellent with DEET on infants under age 2 months, and use it with caution on children ages 2 months to 12 years of age.

Make outdoor play areas safe

Carefully maintain all equipment, and make sure that swings are made of soft materials such as rubber, plastic or canvas. Make sure children cannot reach moving parts that might pinch or trap a body part. If your play area has a metal slide or other metal play surfaces, let children play on them only when they are cool—hot metal play equipment can burn little arms and legs. If possible, consider moving such equipment to a shady spot in your play area.

Use bicycles, skateboards and scooters safely

Make sure children are ready and able to ride a wheeled toy before you let them use it, and that it is the right size for them. A child should be able to place the balls of both feet on the ground when sitting on the seat of a wheeled toy. Children should always wear helmets and protective gear when riding bicycles, skateboards and scooters. Children should never ride in or near traffic, at dusk or after dark.

Handle foods safely during warm weather

Warm summer weather also brings an increase in foodborne illness. This is partly due to a natural increase in environmental bacteria, which flourish in warm and humid conditions. Additionally, the food we bring on summer outings is often not packed or stored properly to discourage the growth of pathogens.

Symptoms of food poisoning include vomiting, diarrhea, and loss of appetite. While these symptoms may be only a mild inconvenience to a healthy person, foodborne infections can cause severe dehydration in infants, young children, or any persons whose immunity is weakened by chronic disease.

Parents and child care providers need to observe food safety rules especially carefully in summer:

- Perishable items from the refrigerator should be kept in the refrigerator until it is time to eat. For trips or picnics, keep these foods in an insulated cooler, with several inches of ice or ice packs. Common sources of food poisoning in summer include potato salad, cold cuts, pasta salads, and other egg or dairy-based cold dishes. Proper storage can prevent this from happening.
- Keep cold foods cold and hot foods hot. Never mix them when serving or storing.
- Keep raw meat away from cooked food or food that is ready to serve. Also keep the utensils, plates, cutting board, etc., used to prepare raw meat away from prepared food.
- Cook all meat to *at least* the recommended minimum internal temperature. The recommended temperature varies for different types of meats, and should be prominently featured on the meat's label or packaging material. When you shop, be sure the meat you buy has this information provided on the packaging.
- Cold food should be left out no longer than two hours at room temperature (one hour if the temperature is 90° or higher). After that, discard it.
- Wash hands frequently during food preparation. For picnics, bring along disposable towelettes for hand washing.

For more information, see CCHP's related Health and Safety Notes *West Nile Virus: What You Should Know*, *The Use of Insect Repellent by Child Care Programs*, and *Sun Smart Policy*. Visit www.ucsfchildcarehealth.org or call the Healthline at (800) 333-3212 for copies.

References

<http://aapnews.aappublications.org/cgi/content/full/e200399v1>.

American Academy of Pediatrics at www.aap.org.

Sun Smart Policy and *Sunscreen Consent Form*. California Childcare Health Program, 2004.

California Early Childhood Sun Protection Curriculum (rev. 1998). Skin Cancer Protection Program. Cancer Prevention and Nutrition Section, California Department of Health Services. www.dhs.ca.gov/ps/cdic/

United States Food and Drug Administration, Partnership for Food Safety Education; Fight Bac This Summer at www.fightbac.org/summer_tools.cfm.

Rev. 8/5/04

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The Use of Insect Repellent by Child Care Programs

Insect repellents help reduce the exposure of children to insect bites, which can cause local allergic reactions and some diseases. Of particular concern are bites from mosquitoes and ticks. Mosquitoes can carry viruses and parasites that cause West Nile virus or other illnesses. Ticks can cause Lyme disease and other illnesses. These diseases can be serious but they are also rare. There has been an increase of reported cases of West Nile virus disease in California, and this is cause for concern. However, taking care to prevent exposure to the insects that carry these diseases is important, and preparation is better than panic when there is an outbreak.

What is the most effective insect repellent?

The most effective repellents contain the chemical DEET (chemical name N, N-diethyl-metatoluamide). DEET does not kill insects—it makes it harder for them to locate humans. None of the presently marketed non-DEET products offer the duration of protection of those containing DEET. Until more products become licensed by the EPA, wearing protective clothing, and using DEET on clothing and exposed areas of skin, offers the best protection.

Repellents with DEET are effective only at short distances, so you may still see mosquitoes or other insects flying nearby even when you have applied a repellent. As long as you are not getting bitten, there is no reason to apply more DEET.

Using insect repellents with DEET

Repellents are available with concentrations ranging from 10 percent to 30 percent DEET. The higher the concentration, the longer the product's effects will last. Use the concentration of DEET that is appropriate for the amount of time you will be exposed. Insect

repellents containing DEET with a concentration of 10 percent appear to be as safe as products with concentration of 30 percent for adults, when used according to the directions on the product labels. Followed the directions on the label exactly.

DEET insect repellents should be used with caution on children 2 months to 12 years of age. DEET is not recommended for infants under 2 months old.

Use DEET sparingly on exposed skin only; do not apply under clothing. Do not use DEET on the hands of young children. Do not apply to hands, areas around the mouth, eyes, or on skin that is irritated or has open sores. Wash treated skin with soap and water after returning indoors; wash treated clothing. Avoid spraying in enclosed areas and do not use DEET around food.

Because repellents can cause a skin reaction, parents or guardians should apply repellent to children once or twice at home before it is used in child care to be sure the child is not sensitive or allergic to it, and provide written consent to apply insect repellents in child care. If there is a reaction, wash the affected skin and call the parent or guardian to seek medical advice.

For more information, see CCHP's related Health and Safety Notes *Summer Safety* and *West Nile Virus: What You Should Know*. Visit www.ucsfchildcarehealth.org or call the Healthline (1-800-333-3212) for copies.

References

<http://aapnews.aappublications.org/cgi/content/full/e200399v1>

www.epa.gov/pesticides/factsheets/chemicals/deet.htm.

www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm.

by Judy Calder, RN, MS (07/03) (rev. 08/4/04)

Parent/Guardian Permission to Apply Insect Repellent to Child

Name of Child: _____

As a parent, I recognize that insect bites to my child pose a risk of allergic reactions and disease.

Therefore, I give permission for the staff of _____ to apply
name of child care program
an insect repellent approved for use on children (name of product) _____

to my child under the following conditions:

1. When mosquitoes are present.
2. During field trips that may expose a child to ticks or mosquitoes.
3. Always used according to directions on the label.
4. Applied only to exposed skin and clothes.
5. Not applied to babies under 2 months.
6. Not applied near eyes or mouth or on hands.

DEET-based products offer the best protection against mosquitos. Use of the product may occasionally cause a skin reaction. If that happens, we will discontinue use of the product, wash affected skin and notify you so you can seek advice from your health care provider. It is best if you use this or a similar product on your child once or twice at home first to monitor for reactions.

I have checked and initialed below all applicable information regarding the child care program's choice in brand/type and use of insect repellent for my child:

- ___ Staff may use the program's insect repellent indicated above according to the directions on the product label.
- ___ I do not know of any allergies my child has to children's insect repellent.
- ___ My child is allergic to some insect repellents. Please use only the following brand(s)/type(s) of repellent: _____, according to the directions on the label.
- ___ I have provided the following brand/type of insect repellent for use on my child:

- ___ For medical or personal reasons, please DO NOT apply insect repellent to the following areas of my child's body:

- ___ **Please do not apply insect repellent to my child.**

Parent/Guardian's Name: _____ Date: _____

Parent/Guardian's Signature: _____

Health Provider's Signature (optional): _____

LESS-TOXIC ALTERNATIVES TO COMMON HAZARDOUS HOUSEHOLD PRODUCTS

Common household products, even when used as directed, can be dangerous or hazardous. If words such as flammable, corrosive, reactive or toxic appear on the products' packaging, then looking for some safer and more earth-friendly choices is a good idea.

Try these non-toxic or less-toxic products as alternatives to common hazardous household products. While a little more “elbow grease” may have to be used with some of these products, the benefits in terms of improved indoor air quality, decreased exposure to chemicals, fewer waste disposal concerns, convenience, and lower costs should make the switch an easy one to make.

Air Fresheners/Deodorizers to inhibit mold and bacteria growth that can cause odors:

- Leave open boxes of baking soda in refrigerator, closets and bathrooms.
- Saturate cotton balls with pure vanilla; set out in dish in room.
- Pour white vinegar in dishes/bowls; set out in room.
- Simmer cinnamon and cloves in water on low heat.
- To clean garbage disposals, grind used lemons in the disposal or pour in baking soda.
- For carpets, mix 1-part borax to 2-parts cornmeal; sprinkle liberally on carpet and vacuum after an hour.
- Sprinkle baking soda or ½ cup borax in the bottom of garbage cans and diaper pails

Disinfectant means anything that will reduce the number of harmful bacteria on a surface. Practically no surface treatment will completely eliminate bacteria. Regular cleaning with soap and hot water is important. Or mix ½ cup borax into 1 gallon of hot water to disinfect and deodorize; do not rinse off borax mixture if you want to inhibit mold and mildew. Isopropyl alcohol is an excellent disinfectant, but use gloves and keep it away from children.

Cleaning Products

- **All-purpose cleaner** can be made from a white vinegar and salt mixture or from 4 tablespoons baking soda dissolved in 1 quart warm water.
- **Washing dishes** by hand, use ½ cup baking soda with a squeeze of lemon juice to create a mild dishwashing liquid to help cut grease and food.
- **Automatic dishwashers**, choose a detergent with the lowest phosphate count listed on the package.
- **Scouring powder** can be made from baking soda or dry table salt. Or try non-chlorinated Bon-Ami Cleaning Powder or Bon-Ami Polishing Cleaner (available in most supermarkets).
- **Floor cleaner and polish** can be as simple as a few drops of vinegar in the cleaning water to remove soap traces. For vinyl or linoleum, add a capful of baby oil to the water to preserve and polish. For wood floors, apply a thin coat of 1:1 oil and vinegar and rub in well. Painted wooden floors, mix 1 teaspoon washing soda into 1 gallon hot water. Brick and stone tiles, use 1 cup white vinegar in 1 gallon water and rinse with clear water.

- **Oven cleaners:** sprinkle salt on spills when they are warm, and then scrub. Mix 2 tablespoons liquid soap, 2 tablespoons borax, 1 quart of warm water; leave on oven surfaces for 20 minutes, then scrub with fine steel wool. Scrub pots with baking soda, salt and water paste.
- **Toilet bowl cleaner** can be made with a paste of borax and lemon juice. Clean frequently with a solution of ½ cup borax in 1 gallon water for cleaning and disinfecting. To remove lime deposits, pour full strength white vinegar in the bowl, let it sit for several hours, then scrub with sturdy brush.
- **Tub/tile cleaner** can be as easy as rubbing in baking soda with a damp sponge and rinsing, or wiping with white vinegar first, and following with baking soda as a scouring powder. Or try non-chlorinated scouring powder, such as Bon-Ami Cleaning Powder or Bon-Ami Polishing Cleaner (available in most supermarkets). For tub and sink stains, scrub with a paste made from cream of tartar and hydrogen peroxide. For grout, combine 3 cups of baking soda and 1 cup warm water, and scrub into grout; rinse well with water. For soap film on fiberglass surfaces, apply baking soda with a damp cloth, rub and rinse off residue. For shower-door tracks, pour full strength white vinegar into the track, let it soak for 10 minutes, and rinse.
- **Window/glass cleaner:** to avoid streaks, don't wash windows when the sun is shining. Combine a quart of water with ¼ to ½ cup of white vinegar, 1-2 tablespoons of lemon juice; or combine juice from 1 lemon, 2 cups of water or club soda, 1 teaspoon cornstarch. Spray on surfaces and wipe clean with lint-free cloth or newspaper, unless you are sensitive to the inks in newsprint. Dip glassware and crystal into water mixed with a splash of vinegar and dry with a lint-free cloth.
- **Metal cleaners/polishes** are different for each metal. Clean aluminum with a solution of cream of tartar and water. Brass may be polished with a soft cloth dipped in lemon-and-baking-soda solution, or vinegar-and-salt solution. Polish chrome with baby oil, vinegar, or aluminum foil shiny side out. Clean tarnished copper by boiling the article in a pot of water with 1 tablespoon salt and 1 cup white vinegar, or try differing mixtures of salt, vinegar, baking soda, lemon juice, and cream of tartar. Clean gold with toothpaste; pewter with a paste of salt, vinegar, and flour. Silver can be polished by boiling it in a pan lined with aluminum foil and filled with water to which a teaspoon each of baking soda and salt have been added. Stainless steel can be cleaned with undiluted white vinegar.
- **Upholstery, rug and carpet cleaners:** clean spills immediately with club soda. Mix 1 quart water, 1 teaspoon mild liquid soap, 1 teaspoon borax, and a squeeze of lemon juice or a splash of white vinegar; apply with a damp cloth or sponge and rub gently; wipe with a clean cloth and allow to dry.
- **Drain openers:** pouring ¼ cup of salt down the drain followed by boiling water once a week can help keep drains from getting blocked. To unclog a drain, pour ½ cup of baking soda down the drain, followed by ½ cup of white vinegar. Let it sit for a few minutes, then pour 2 liters of boiling water down the drain to flush.
- **Mold/mildew –use a mixture of equal parts white vinegar and salt.**

Laundry Products

An effective alternative to using detergents is to return to soap. Soap is an effective cleaner for natural fabrics, leaving such items as diapers softer than detergent can. For cotton and linen, use soap to soften water. A cup of vinegar added to the wash can help keep colors bright (but DO NOT use vinegar if you are using bleach—the resulting fumes are hazardous). Silks and wools may be hand washed with mild soap or a protein shampoo, down

or feathers with mild soap or baking soda. For synthetic fabrics or blends (including most no-iron fabrics), there are biodegradable detergents on the market that do not contain phosphates, fragrances, or harsh chemicals.

- Adding $\frac{1}{4}$ to $\frac{1}{2}$ cup of baking soda or vinegar during final rinse will leave clothes soft and fresh smelling.
- Use $\frac{1}{2}$ cup borax (instead of bleach) per load to whiten and brighten colors and to remove spots.

Spot and stain remover: pour club soda on fresh spots and stains.

For chocolate, coffee, mildew, mud, and urine: dissolve $\frac{1}{4}$ cup borax into 2 cups cold water; sponge on and let sit until dry, then wash with soap and water to completely remove.

For bloodstains: (1) Immediately clean stain with club soda or sponge with cold water; dry with towel and repeat if needed. (2) Rub with cornstarch or cornmeal and water paste; let dry in sun; brush off. (3) If stain persists, then pour hydrogen peroxide directly on stain; rinse with water and wash as usual or apply mixture of $\frac{1}{4}$ cup borax and 2 cups cold water, rinse and wash.

For grease: (1) Apply paste of cornstarch and water; let dry then brush off. (2) Cover with baking soda or cornmeal; let dry and brush off.

For ink, mix with cold water, 1 tablespoon cream of tarter and 1 tablespoon of lemon juice; rub into stain for about a minute, then brush off powder with a clean brush, and sponge immediately with warm water; repeat if needed.

For rust, moisten spot with lemon juice, sprinkle with salt and expose to sunlight. For rust stains on whites, cover the stains with cream of tarter, gather up the article so that powder stays on the spot, submerge the whole thing in hot water for 5 minutes, then wash as usual.

Spray starch

- For regular fabrics, dissolve 2 tablespoons cornstarch in a pint of cold water; store in spray bottle and shake well before using.
- For delicate fabrics, dissolve packaged unflavored gelatin in 2 cups hot water; store in spray bottle and shake well before using. To test solution: tip corner of fabric in solution; if fabric becomes very sticky when dry, add more water.

Environmentally Responsible Products

The following are a sampling of websites available, and not an endorsement by the California Childcare Health Program.

EcoMall

www.ecomall.com

Cleaning Pro

www.cleaningpro.com

Earth Friendly Products

www.ecos.com

Seventh Generation

www.seventhgeneration.com



NO SMOKING

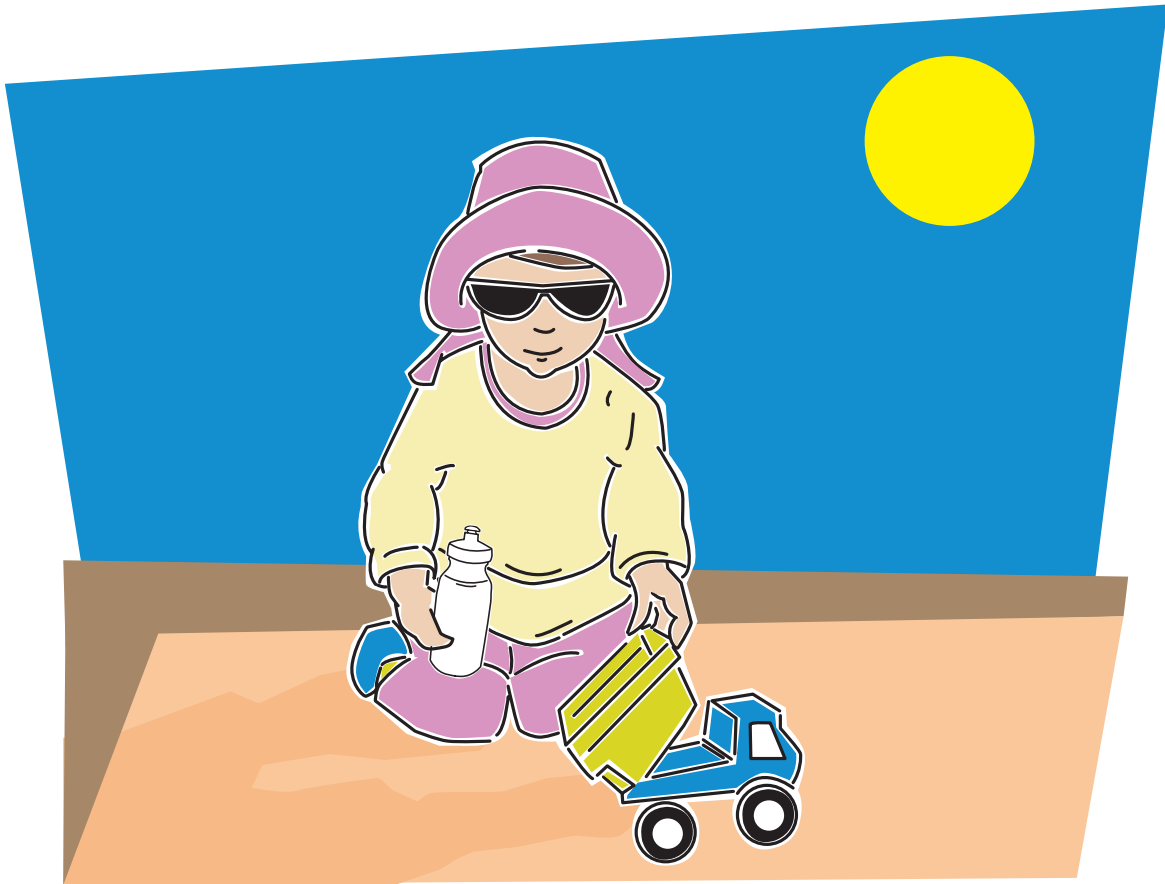
California
child care regulations
prohibit smoking
when children are present



We don't allow smoking at any time

**STOP
INJURIES**

SUN PROTECTION



Make playtime in the sun safe and fun. Remember:

- Sunlight is strongest between 10 a.m. and 3 p.m.
- Water, sand and snow make the sun's rays stronger
- Clouds don't block the sun's rays
- Babies under 6 months should **STAY OUT** of direct sunlight

When in the sun:

- Use sunscreen of SPF 15 or more
- Wear protective clothing, including a hat
- Wear sunglasses with UV protective coating
- Take breaks in the shade
- Drink plenty of water



CHILD CARE INVENTORY FOR AIR POLLUTION HAZARDS

Potential Hazard	Relevant air pollutant	Recommended Actions for Prevention/ Management of Air Pollution Exposure	By Whom
Location of facility	Ozone (smog), lead, sulfur compounds, nitrogen oxides, nitrogen dioxide in ambient air	<p>Keep track of ambient air quality in the community.</p> <p>On bad air days,</p> <ul style="list-style-type: none"> • restrict the amount of time children spend outside, especially if lots of physical activity is involved; and • reschedule outdoor physical activity to the early morning when ozone levels are lower. 	<p>Provider</p> <p>Provider</p>
Location of facility	Radon	<p>Radon is present in most soil and rock, particularly in mountainous areas. Contact the radon office in your state environmental health department for maps of radon prone areas in your state. When trapped in buildings radon can reach elevated levels. Also, radon levels can also vary significantly from house to house. Every ECE facility should be tested to insure that air is free of radon in excess of 4 picocuries per liter of air.^{5.005, 5.007, 5.103} “Do-it-yourself” radon test kits are readily available from hardware and home improvement stores or through mail order companies for a cost of approximately \$15-\$25. The cost usually includes fees for lab analysis and mailing. For more information on radon testing and radon educational programs, get in touch with your state radon contact at www.epa.gov/iaq/contacts.html.</p>	<p>Provider</p>
Location of facility	Carbon monoxide, nitrogen dioxide, smoke, soot, dust from nearby highways, factories, or plants.	<p>Provide outdoor play in areas away from emissions from any nearby industrial sites.^{5.169}</p> <p>Plan outdoor activities for areas away from traffic.</p>	<p>Provider</p> <p>Provider</p>
Home furnishings (pressed wood furniture, paneling, carpets, drapes)	Formaldehyde	<p>Purchase furnishings that are laminated or coated.</p> <p>Completely seal or coat raw pressed wood or particle board furnishings with a paint, varnish or vinyl material that does not contain formaldehyde.</p> <p>Wash durable press fabrics before use.</p>	<p>Provider</p> <p>Provider</p> <p>Provider</p>

Potential Hazard	Relevant air pollutant	Recommended Actions for Prevention/ Management of Air Pollution Exposure	By Whom
Age of facility	Asbestos	<p>Older buildings commonly contain asbestos (a fire resistant material) in ceiling or floor tiles, pipe or furnace insulation and on other surfaces. Over time, it can deteriorate and flake into fine dust. If the ECE facility is housed in an older building, the building should be evaluated by a certified professional for the presence and condition of any asbestos.</p> <p>If asbestos is damaged or deteriorating, it should be removed by a certified professional.</p> <p>Any areas of undamaged asbestos should be clearly identified and enclosed so that they are not exposed or disturbed, especially during any remodeling activities.^{5.104}</p> <p>If the facility contains any undamaged asbestos, it should be periodically inspected by a certified professional for damage or deterioration.</p>	<p>Professional</p> <p>Professional</p> <p>Professional/ Provider</p> <p>Professional</p>
Construction materials (pressed wood subflooring, paneling)	Formaldehyde	<p>Purchase pressed wood products for construction or remodeling that specify lower formaldehyde emission levels.</p> <p>Avoid urea-formaldehyde foam insulation.</p> <p>Use wood paneling that does not contain formaldehyde.</p> <p>Install exhaust fans in bathrooms and kitchens.^{5.027, 5.028}</p> <p>Generally, mobile homes contain a higher percentage of pressed wood products than permanent structures (see page 28). In these types of facilities, insure adequate ventilation by keeping doors and windows open between rooms and to the outside.^{5.042 5.027}</p>	<p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p>
Fuel-burning appliances/ heating sources		<p>All appliances used for heating that are in vicinity of children must have protective screening.^{5.037}</p> <p>Fireplaces and fireplace inserts must be inaccessible to children. If the fireplace is used, adults must be in the room within easy reach of the children.^{5.038}</p>	<p>Provider</p> <p>Provider</p>

Potential Hazard	Relevant air pollutant	Recommended Actions for Prevention/ Management of Air Pollution Exposure	By Whom
Cleaning products	Volatile organic compounds	Monitor use of household chemicals. In deciding between two products that produce the same cleaning results, choose the least toxic. Check ingredients on the label, or obtain a Material Safety Data Sheet (MSDS) from the product company. ^{5.102} Under “Health Hazard Rating,” (with a scale from 0 to 4), choose the lowest number.	Provider
		Do not use products containing volatile organic compounds in the presence of food or children.	Provider
		Read and follow directions for use on product labels. Do not mix any cleaning products unless directed on the product label. When instructions state, “use with adequate ventilation”, the best strategy is to use the product outside the building. If the product is used inside the building, increase ventilation during and after use by opening windows and using exhaust fans. ^{5.100}	Provider
		Limit or do not use high solvent cleaners when cleaning the carpet.	Provider
		Store chemicals properly in an area not normally occupied by people, such as a garage or shed, and safely out of reach of children. ^{5.011, 5.100} Buy only the amount you need and store in original container so that safety information is not lost.	Provider
Art materials	Volatile organic compounds	Make sure art materials meet ASTM standards. ^{3.038}	Provider
		After using arts and crafts materials clean area thoroughly by damp mopping.	Provider
		Insure appropriate ventilation when using art materials. ^{5.029}	Provider
		Do not use art materials containing toxic fumes or gases. ^{5.029}	Provider
		Children should not eat or drink while engaged in art projects.	Provider
		Children should wash their hands thoroughly when finished with art work.	Provider

Potential Hazard	Relevant air pollutant	Recommended Actions for Prevention/ Management of Air Pollution Exposure	By Whom
Cleanliness of facility	Dust, soot, asbestos, animal dander, dust mites	<p>Keep the ECE facility clean. On hard surfaces, use damp mops/dust rags instead of dry dusting or sweeping.</p> <p>Limit the use of carpeting. It provides an easy site for biological contaminants to collect and grow. If some soft surfacing is desired, replace carpeting with small, washable area rugs.</p> <p>Vacuum carpeting daily. When vacuuming, use a HEPA filter. (For cleaning carpets, see recommendations for Cleaning Products and Humidity.)</p> <p>Restrict pets (dogs, cats, etc.) from carpeted and sleeping areas of the facility.</p> <p>Launder blankets and bedding materials in sleeping area at least monthly.^{3,028}</p> <p>Consider having children, staff, and visitors leave shoes by the entry door.</p> <p>Regularly clean the drip pan under the refrigerator.</p> <p>Vent clothes dryers to the outside.</p> <p>Keep air filters clean.^{5,031}</p> <p>Schedule cleaning when children are not present.</p> <p>Use cleaning products according to instructions.</p>	<p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p>
ECE staff, parents, and visitors	Environmental tobacco smoke, dust, soot	<p>Maintain a tobacco smoke-free environment.^{3,041, 8,038}</p> <p>Inform staff and parents regarding presence of any potentially hazardous substances in facility, e.g., encapsulated or enclosed asbestos, formaldehyde, or other hazardous chemicals.^{5,102}</p>	<p>Provider</p> <p>Provider</p>

Potential Hazard	Relevant air pollutant	Recommended Actions for Prevention/ Management of Air Pollution Exposure	By Whom
Humidity	Mold, mildew, formaldehyde	<p>Increase ventilation.^{5.042} Open windows and doors to provide fresh air from the outside.</p> <p>If an air filtering system is installed make sure it is properly maintained.</p> <p>When wet cleaning carpeting, do not saturate it. Use a hot water extractor to reduce the amount of water remaining in the carpeting. Use fans and a dehumidifier in the carpeted room in order to dry it within 24 hours.^{3.026, 3.028, 3.034, 5.079, 5.108-5.109}</p> <p>Vent the clothes dryer to the outside of the house.</p> <p>Install exhaust fans in bathrooms and kitchens.^{5.027, 5.028, 5.031}</p> <p>Limit the use of humidifiers. If humidifiers are used occasionally, maintain and clean them regularly and frequently.</p> <p>Use a dehumidifier in high moisture areas such as basements.</p> <p>Do not use carpeting directly on cement floors or in damp areas like the basement.</p> <p>Promptly repair roof, pipe, and basement leaks.</p> <p>Discard water damaged porous items (sheetrock, paneling, carpets, furniture, etc.) especially if repeatedly dampened or wet for more than 24 hours.</p> <p>Keep facility warm enough (65°-75°) to prevent moisture buildup or condensation (and mold growth), especially in poorly insulated areas. Properly insulate and correctly install a vapor barrier in wall and ceiling areas. Year round, try to keep the indoor relative humidity below 50 percent.^{5.028, 5.029, 5.041}</p>	<p>Provider</p> <p>Professional</p> <p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p> <p>Provider</p>

CHILD CARE INVENTORY FOR WATER POLLUTION HAZARDS

Potential Hazard	Recommended Actions for Prevention/Management of Water Pollution Exposure	By Whom
Public water supply	If using water from a public water supplier, read your Consumer Confidence Report to learn whether your water system meets all drinking water standards. ^{5.055} This report is available from your water supplier, and is also available online at: www.epa.gov/safewater/dwinfo.htm .	Provider
Well water	If using water from a private well, have it tested regularly to meet federal, state and local standards. Contact your health department for more information on testing private well water. ^{5.055} Consider using a water filter certified by an independent, nonprofit, health and safety product certifier, such as NSF International. Contact NSF at www.nsf.org or call 1-800-NSF-MARK. To be effective, filters must be maintained according to the manufacturer's directions.	Certified Professional Provider
Water piping and joint seals	If interior or service piping or joint seals contain lead, have your drinking water (private and public) tested for lead. Contact your health department and ECE office for more information. ^{5.061} Make sure water and plumbing systems meet state and local regulations for buildings. ^{5.055-5.058}	Provider Provider/CCHC
Water storage for emergencies	Have a safe water supply available for emergencies. ^{5.063}	Provider
Diet	Check with your state health, environmental, and conservation departments regarding any fish advisories related to water pollutants such as PCBs or mercury in fish in your area.	Provider
Recycling/waste disposal	Help protect your drinking water sources: <ul style="list-style-type: none"> • Take used motor oil to a recycling center. If you let it drain into a storm sewer or bury it in the trash, it can leak into lakes, rivers and wells. Just one pint of used motor oil can expand over great distances and cause adverse effects to human health and the environment. • Properly dispose of toxic household trash. For example, batteries contain lead and mercury. Some household cleaners also contain substances that contaminate water. Many communities have special collection sites for these items. • Do not dispose of chemicals into septic systems, dry wells, storm water drainage wells or other shallow disposal systems that discharge to ground water. • Find out what your community is doing to protect your water source and get involved. Work with schools, civic groups and others to start a protection program. 	Provider Provider Provider Provider/CCHC

SUPPLEMENTARY MATERIALS ON ENVIRONMENTAL TOPICS OF SPECIAL INTEREST TO ECE PROVIDERS

ART MATERIALS: KEY POINTS and PREVENTIVE ACTIONS

Key Points

Art activities are a key component of any child care program, allowing children to express themselves creatively.

Some art materials contain chemicals such as metals (e.g., lead), solvents (e.g., turpentine), and dusts or fibers (e.g., asbestos) that are hazardous if inhaled, absorbed or swallowed. For example, lead can be found in artist's paints since legal bans on lead and other metals do not apply. Lead and other toxic metals can also be found in pastels, pigments, inks, glazes, enamels and solder (AAP, 2003).

Much of the risk from art materials can be eliminated by carefully selecting materials that are safe for use by children. The product label provides key information.

When products are labeled *nontoxic*, it means that the product has passed the short-term toxicity test required by the Federal Hazardous Substance Act (FHSA), but does not mean it passes the long-term toxicity test.

The Labeling of Hazardous Art Materials Act (LHAMA) supplements the FHSA, requiring manufacturers of hazardous art materials to do the following: (a) determine the potential for chronic long-term health hazards and (b) place appropriate warning labels on those products found to pose such chronic long-term effects.

Arts and crafts materials imported or sold in the United States are required by the LHAMA to meet the ASTM (American Standards for Testing Materials) D-4236 regulations for chronic long-term health hazards. It is illegal to sell an art product in the United States that does not have this statement on its label. It is important to note that this statement does not mean the product is safe; rather it has been certified by a toxicologist that the label information provides enough information for safe use (Arts, Crafts, and Theater Safety [ACTS], 2000).

Product seals are not required by law. These seals identify a company or group such as the Art and Creative Materials Institute (ACMI), whose toxicologist certified the product (ACTS, 2000). The ACMI seals are the AP (approved product—nontoxic even if swallowed), CP (certified product—nontoxic even if swallowed, and meet or exceed quality standards of material, workmanship, working qualities and color) and *Health Label* (no health labeling required) (AAP, 2003).

Preventive Actions

Choose products that have the following on the label:

- Nontoxic.
- Conforms to ASTM D-4236 statement.
- Clearly marketed for children.
- No hazards or precautionary statements.

Certified or approved product seals indicate the company ACMI has tested the product, and it contains no materials in sufficient quantities to be toxic or injurious even if ingested.

Obtain and read the Material Safety Data Sheet (MSDS) for the product and check for toxic ingredients. If in doubt, contact the manufacturer, toxicologist or a poison control center for more information.

Always follow the directions and precautions on the packaging label carefully.

Choose materials designed not to create dusts, sprays, vapors or fumes which can be inhaled or which result in excessive skin contact. For example:

- It may be safer to buy supplies in premixed or liquid formulations instead of powder forms to reduce exposure to dusts.
- Use water-based products instead of oil-based, keeping in mind to read the label and look for materials identified as safe for children.

Equip craft areas appropriately:

- Use work surfaces that are hard and smooth for easy and thorough cleaning.
- Ventilate.
- Store materials safely.
- Protect against exposure (e.g., wear aprons, do not allow food and drink in the art area, and have children wash their hands after doing arts and crafts).
- Use age-appropriate products (e.g., do not let children use adult art materials that contain toxic chemicals).

Supervise children closely. For example, some children are attracted to fruit-scented markers and may try to eat them.

References

American Academy of Pediatrics. (2003). *Handbook of pediatric environmental health*. Elk Grove (IL): American Academy of Pediatrics.

Arts, Crafts and Theatre Safety, Inc. (2000). *Selecting children's art materials*. New York (NY): Arts, Crafts and Theatre Safety, Inc.

Where to Find More Information

University of Nebraska Cooperative Extension. *Safety in children's arts and crafts projects*. Lincoln (NB): University of Nebraska Cooperative Extension; 1994. Retrieved August 19, 2002, from <http://www.ianr.unl.edu/pubs/safety/g1211.htm>.

CLEANING PRODUCTS: KEY POINTS and PREVENTIVE ACTIONS

Key Points

Many common cleaning products and household products contain volatile organic compounds (VOCs), organic solvents that easily evaporate into the air. Furniture cleaners and polishes, floor cleaners and polishes, oven cleaners, household cleansers, carpet shampoos and disinfectants are a few examples.

Short-term effects include eye, nose and throat irritation, as well as headaches. Long-term exposure can cause loss of coordination; nausea; and damage to the liver, kidneys and central nervous system. Some organics can cause cancer in animals and are suspected of causing cancer in humans.

Preventive Actions

First, read the labels of products you are considering buying. Buy the least harmful product available. Choose products labeled warning or caution since these are less harmful than those labeled poison or danger.

Always use household products only for their intended purpose and according to the manufacturer's instructions.

Use the product in a well-ventilated area.

Choose products that are packaged to reduce the chance of spills, leaks and child tampering.

Keep household products in their original containers so that safety information and directions for use are always with the product.

Avoid excessive use.

Do not mix up “extra-strength” batches; dilute according to the manufacturer's directions.

Make sure products are safely stored where children cannot get them.

Reduce the need for these products by doing the following:

- Quickly attending to spills and stains and removing food wastes promptly.
- Using alternative (use ingredients such as vegetable-based liquid soap, baking soda and vinegar) or less toxic products. Remember while alternative or less toxic products are safer, they are not all nontoxic. Use the same precautions as with other cleaners such as storing out of the reach of children. An important consideration when making your own cleaners is to store them in unused, store-bought containers (never put them in old food containers) and label them carefully.
- Using a multipurpose cleaner so that you do not need to have a different product to clean each surface in your house. Choose a cleaner without antimicrobial agents. Keeping sanitizers and disinfectants out of cleaners reduces their toxicity and reduces the amount of disinfectant chemical used.

NOISE: KEY POINTS and PREVENTIVE ACTIONS

Key Points

“As with all the senses, human beings are designed to detect changes in sound, but not to endure a steady onslaught of it . . . Unlike adults, children have few habituated responses for lessening the impact of noise and virtually no control over what they hear” (Olds, 2001, p. 180).

“Sound is also an important source of orientation and security, especially for children. Many find the sounds of other children crying, of unfamiliar equipment, and even the experience of extreme quiet to be anxiety-provoking. On the other hand, familiar sounds—human voices, soft music, birds, and breezes outside—are comforting and reassuring, especially in a strange place” (Olds, 2001, pp. 180-181).

Although few studies have been done to estimate children’s exposure to noise, noise affects hearing and can result in physiologic effects such as sleep deprivation and undesirable cardiovascular effects, and psychological effects such as annoyance, interference with activity, and symptoms such as headaches, tiredness and irritability (AAP, 2003).

It is likely that children are routinely exposed to more than the 24-hour equivalent noise exposure of 70dBA recommended as an upper limit by the U.S. EPA in 1974. Examples of sounds at 70dBA include a vacuum cleaner, freeway traffic at 15 meters, a noisy office or party, and TV audio (AAP, 2003).

Preventive Actions

Reduce a room’s “echoing” qualities by adding absorbent surfaces and by varying ceiling and furniture heights.

Reduce sources of loud noises (e.g., toys that make loud noises; lower the volume on computers and radio/tape/CD players when in use; use headphones with caution—set the volume level so that normal conversation can still be heard).

Separate quiet and noisy areas when designing play areas.

Block noise from the outside with techniques similar to conserving energy indoors: double windows, weather stripping on doors and windows, and the sealing of air leaks. Dampen the sound around the building with landscaping such as a dense barrier of trees and shrubs.

Introduce a pleasing background sound to help offset noise and make the direct sounds from children and activities less noticeable.

Introduce acoustic pleasure (e.g., hang wind chimes inside as well as outside an open window).

References

American Academy of Pediatrics. (2003). *Handbook of pediatric environmental health*. Elk Grove (IL): American Academy of Pediatrics.

Olds, A.R. (2001). *Child care design guide*. New York (NY): McGraw-Hill.

SUN SAFETY: KEY POINTS and PREVENTIVE ACTIONS

Key Points

While some exposure to sunlight can be enjoyable, too much can be dangerous. Overexposure to ultraviolet (UV) radiation in sunlight can result in a painful sunburn. It can also lead to more serious health effects, including skin cancer, premature aging of the skin and other skin disorders; cataracts and other eye damage; and immune system suppression.

Children are particularly at risk of overexposure, since most of the average person's lifetime exposure occurs before the age of 18.

Currently, one in five Americans will develop skin cancer during his or her lifetime. The incidence of melanoma, the most serious type of skin cancer, is increasing faster than almost every other form of cancer.

Due to the depletion of the ozone layer, increased levels of harmful UV radiation are likely to reach the Earth.

Many believe that only lighter-skinned people need to be concerned about the effects of overexposure to the sun. Though it is true that darker skin has more natural pigment, which is protective, the skin is still vulnerable to many of the damaging effects of UV radiation. The incidence of skin cancer is lower in dark-skinned people, but it still occurs and is often not detected until later stages when it is more dangerous.

The risk of other UV-related health effects, such as cataracts, premature aging of the skin and immune suppression, is not dependent upon skin type (EPA, 2005).

Preventive Actions

The best sun protection is provided when all the sun-safe behaviors are practiced together. See *Handout: Health and Safety Notes: Summer Safety* and *Handout: Survival Tips Poster: Sun Protection*. Sun protection habits include the following:

Limit Time in the Midday Sun. The sun's rays are strongest between 10 a.m. and 4 p.m. Whenever possible, limit exposure to the sun during these hours.

Seek Shade. Staying under cover is one of the best ways to protect yourself from the sun. Remember the shadow rule: Watch Your Shadow. No Shadow, Seek Shade! (American Academy of Dermatology, 2005).

Always Use Sunscreen. Liberally apply a broad spectrum (blocks UVA and UVB) sunscreen with a Sun Protection Factor (SPF) of at least 15 or higher on exposed skin and reapply every 2 hours when working or playing outdoors. Even waterproof sunscreen can come off when you towel off, sweat or spend extended periods of time in the water. Sunscreen should be applied 30 minutes before exposure to the sun and reapplied every 2 hours. "The issue of whether sunscreen is safe for infants under the age of 6 months is controversial" (AAP, 2003, p. 244). Of primary importance in this age group is to avoid high-risk exposure and use enough protection through the use of clothing, hats and shade. Remember, best practice indicates that the ECE program has a written policy for the use of any commonly used nonprescription medication for oral or topical use and that it includes parental consent. Sunscreen should be included in this policy (AAP et al., 2002, Standard 8.021).

Wear a Hat. A hat with a wide brim offers good sun protection for your eyes, ears, face and the back of your neck—areas particularly prone to overexposure to the sun.

Cover Up. Wearing tightly woven, loose-fitting and full-length clothing is a good way to protect your skin from the sun's UV rays.

Wear Sunglasses That Block 99-100% of UV Radiation. Sunglasses that provide 99% to 100% UVA and UVB protection will greatly reduce sun exposure that can lead to cataracts and other eye damage. Check the label when buying sunglasses.

Watch for the UV Index. The UV Index provides important information to help you plan your outdoor activities in ways that prevent overexposure to the sun. Developed by the National Weather Service and EPA, the UV Index is issued daily in selected cities across the United States.

References

American Academy of Pediatrics. (2003). *Handbook of pediatric environmental health*. Elk Grove (IL): American Academy of Pediatrics.

American Academy of Dermatology. (2005). *Sun protection for children: Parents' Guide to Sun Protection for Children The ABCs for FUN in the SUN*. Retrieved December 4, 2005, from <http://www.aad.org/public/Publications/pamphlets/SunProtectionChildren.htm>.

California Early Childhood Sun Protection Curriculum (1999). California Department of Health Services. Sacramento, CA: Author. Retrieved March 2, 2006, from http://www.dhs.ca.gov/ps/cdic/CPNS/skin/images/skin_sunproteccurriculum.pdf.

U.S. Environmental Protection Agency. (2005). *Sunwise school program*. Retrieved December 5, 2005, from <http://www.epa.gov/sunwise/summary.html>.

Where to Find More Information

Centers for Disease Control and Prevention. (2001). *When you're in the sun choose your cover*. [online] Retrieved August 19, 2002, from <http://www.cdc.gov/chooseyourcover/>.

Environmental Health Center of the National Safety Council. (2001). *Sun safety: sun safety links*. [online] Retrieved August 19, 2002, from <http://www.nsc.org/ehc/sunwise/sunlinks.htm>.

WEATHER WATCH: KEY POINTS and PREVENTIVE ACTIONS

Key Points

Heat- and cold-related injuries are serious problems for children, resulting in death, heatstroke, heat exhaustion, frostbite and hypothermia.

“Watching the weather is just a part of the job for child care providers” writes Healthy Child Care Iowa in their Child Care Weather Watch Factsheet (Healthy Child Care Iowa, 2002).

Understanding the weather forecast means understanding weather terminology such as windchill (how cold it feels when air temperature and wind are combined) and heat index (how hot it feels when air temperature and relative humidity are combined). For example, a windchill factor of 16°F (30°F and a wind speed of 10 mph) is cold and a heat index of 95°F (90°F and a relative humidity of 45) is uncomfortable.

Preventive Actions

Play outdoors when it is safe and comfortable for the children. Use a windchill factor and heat index chart as a guide (e.g., see Child Care Weather Watch).

Provide cooling-off activities such as running through a sprinkler when temperatures are high. Provide an air-conditioned environment when the heat index, both humidity and temperature, is high.

Keep children hydrated, especially in high temperatures and when they are physically active. Water is best.

Monitor the length of time outside based on the child’s age and weather conditions.

Dress children to maintain a comfortable body temperature.

In warm weather, this should be lightweight cotton protective clothing, including hats.

In cold weather, this should be loose-fitting, lightweight, warm clothing in several layers. The trapped air between the layers serves to insulate. Layers can be removed to avoid perspiration and subsequent chill. Outer garments should be tightly woven, water repellent and hooded if possible. Since half of all body heat is lost through the top of the head, hats are necessary. Mittens, snug at the wrists, are better than gloves. It is important to make sure that children stay dry (Schneider and Freeman, 2000).

References

Healthy Child Care Iowa. (2002). *Child care weather watch*. Des Moines, IA: Department of Public Health.

Schneider, D., & Freeman, N. (2000). *Children’s environmental health: reducing risk in a dangerous world*. Washington, DC: American Public Health Association.

