Indoor Air Quality Guidelines
April 2017

BEST PRACTICES FOR REDUCING CONTAMINANTS AT CHILD CARE FACILITIES

IDAHO DEPARTMENT OF HEALTH AND WELFARE
DIVISION OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SECTION
IDAHO PUBLIC HEALTH DISTRICTS

IDAHO DEPARTMENT OF HEALTH & WELFARE
DIVISION OF PUBLIC HEALTH

Best Practices for reducing contaminants at Child care Facilities

Idaho department of Health and Welfare
Division of Public Health
Environmental Health Section
Idaho Public Health Districts

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INTRODUCTION

Nearly 15 million children in the United States regularly attend childcare. According to the U.S. Census over 140,000 children in Idaho are five years old and younger.[1] Of those children, it is estimated that more than half potentially need child care in one of Idaho's 1,100 plus child care facilities.[2] Since children attending child care spend an average of 36 hours per week there, it is important that child care providers do what they can to reduce exposures to harmful chemicals.

The Environmental Health Education and Assessment Program (EHEAP), in collaboration with the seven local Idaho Public Health Districts, developed this guide. It is intended as a resource for child care providers responsible for taking care of children and maintaining the child care facility. It also provides useful information for child care inspectors and parents.

[1] http://factfinder.census.gov/.

[2] Child care Aware® of America. Child Care in America: 2015 Fact Sheet. Accessed on December 9, 2015. Available from: http://usa.childcareaware.org/wp-content/uploads/2015/10/2015-State-Fact-Sheets-Idaho.pdf.

The objectives of this guide are:
1) To describe the most common hazardous chemicals and materials that may be found in child care facilities.
2) To discuss how children often come into contact with these chemicals and materials.
3) To identify the health effects of exposures to these chemicals and materials at child care facilities and provide guidance for reducing these exposures.
4) To provide sources and links for in-depth, high-quality information for each chemical and material.

Why Are Children More Sensitive to Hazardous Chemicals and Materials?

In general, children are more likely to experience harm from hazardous chemicals for the following reasons:
1) On a pound-for-pound basis, children breathe more air, drink more water, and eat more food than adults.
2) Children's' bodies, especially the nervous system and brain, are still developing.
3) Children spend a lot of time on the floor and often put their hands in their mouths.
4) Children rely on the judgment and care of adults to recognize the hazards in their environment.

Whether a child experiences harmful effects from hazardous chemicals and materials will depend on several factors:

- The relative toxicity of the chemical.
- How the child comes into contact with the chemical (eating, drinking, touching, or breathing)-in most common daycare exposures, eating or drinking a hazardous chemical is by far the most common way that significant harmful exposures occur.

- The amount of the chemical that enters the child's body- Exposure to a lot of a chemical is worse than a little.
- How frequently the child comes into contact with the chemical- The more often the child is exposed, the greater the risk of harm.
- How long the child is in contact with the chemical- The longer the child is in contact with the chemical, the more harm.
- The child's state of health- A child that is sick or has a health condition such as asthma may be much more likely to experience harmful effects from chemicals.
- Age of the child- The younger the child, the more harmful the exposure may be.

It is important to note that the list of hazardous chemicals and materials described in this document does not address every possible harmful chemical that a child could encounter at a child care facility. This guideline is limited to those chemicals most commonly found at child care facilities. Please keep in mind that the presence of hazardous chemicals does not mean that exposures and illnesses are going to happen; rather, it means that daycare providers should take steps at their facilities to reduce harmful exposures for the children under their care.

SECTION 1: VOLATILE ORGANIC COMPOUNDS

Volatile Organic Compounds (VOCs) are chemicals that become a gas at room temperature. There are hundreds of VOCs found in indoor air, sometimes in concentrations that may be harmful, especially to children. VOCs are released from many housekeeping and maintenance products, building materials, furnishings, and equipment. VOCs covered in this section include: air fresheners (sprays, gels, essential oils, scented candles, and diffusers), art supplies (solvents and paints), cleaning products, and formaldehyde.

Air Fresheners

- Air fresheners include a mixture of chemicals that produce a desired aroma. They are commonly used to hide bad smells, but they do not eliminate the odor problem.
- They come in different forms: aerosol sprays, gel fragrances, essential oils, aromatherapy oil diffusers, incense, scented candles, and electric diffusers.
- In the United States, manufacturing companies are not required to include the list of ingredients of air fresheners, so even products labelled "natural" may contain hazardous chemicals.
- Air fresheners release chemicals such as: fragrance ingredients, phthalates, propellants, solvents, and deodorizers. In addition, scented candles can produce several VOCs (formaldehyde, benzene, naphthalene, styrene, acetaldehyde, and xylene) and tiny smoke particles.
- The use of essential oils as air fresheners has become popular in recent years. Essential oils are aromatic oily liquids obtained from plant materials. Some examples include: lavender, eucalyptus, peppermint, pine, lemon, and cedar. Essential oils contain VOCs such as terpenes, esters, aldehydes, ketones, alcohols, phenols, and oxides.

How can children be exposed to chemicals from air fresheners?

- Breathing air immediately after air fresheners are used.
- Touching the floor or other objects where particles from air fresheners fall.
- Eating food contaminated by chemicals from air fresheners.
- Putting hands, toys, or pacifiers (contaminated with chemicals from air fresheners) in their mouths.

What are the health effects of air fresheners on children?

- Fragrance, solvent, essential oil, and deodorizer residues can cause skin and eye irritation. These can also worsen other skin conditions such as eczema or allergic rashes.
- Breathing ingredients from air fresheners can irritate the nose, throat, and lungs. It can also worsen allergies, asthma, or other lung conditions.
- Some of the VOCs present in air fresheners, such as benzene, are known to cause cancer. Other VOCs, such as formaldehyde, are considered to be probable human carcinogens. Because of this, we recommend that children's contact with air freshener residues be reduced as much as possible.

How can you reduce children's exposure to air fresheners?

Avoid using air fresheners at your child care facility. Use other alternatives to improve indoor air quality:

- If possible, open windows or use exhaust fans to circulate air in kitchens, bathrooms, and diaper changing rooms.
- Invest in quality trash containers and diaper pails with tight covers.
- Empty and clean trash containers and diaper pails every day or multiple times a day if possible.
- Clean the refrigerator at least twice per month. Place an open box of baking soda inside to absorb odors.
- Clean food or drink spills immediately.
- Place soiled clothes in sealed bags.
- Check labels and buy low-VOC products.

See the mold subsection for tips to avoid musty smells

Where can you get additional information?

- Environmental Protection Agency: https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality
- Natural Resource Defense Council at: https://www.nrdc.org/resources/clearing-air-hidden-hazards-air-fresheners

ART SUPPLIES

Common art supplies at child care facilities include crayons, chalk, paint sets, glue, colored pencils, and modeling materials, such as Play-Doh®. Paints may contain hazardous chemicals including metals, such as lead, chromium, cadmium, and barium. Other art supplies that may have hazardous chemicals include: powdered paints, spray paints, commercial dyes, permanent felt tip markers, white board markers, or scented markers. Specific products like instant paper mâché may contain asbestos and metals from printing ink.

How can children be exposed to chemicals from art supplies?

- Breathing vapors from art supplies.
- Eating or chewing art supplies.
- Chemicals in some art supplies may be absorbed through the skin.

What are the health effects of chemicals from art supplies?

- Breathing vapors from art supplies can irritate a child's nose, eyes, throat, and lungs. In poorly ventilated rooms, some vapors can worsen asthma and result in nausea and headaches.
- Some chemicals in art supplies can cause skin rashes and allergies.

How can you reduce children's exposure to hazardous chemicals in art supplies?

- Look for art supplies labeled as "child-safe" or "approved for children." The Art and Creative Materials Institute, Inc. (AMCI) does safety testing and labels art supplies. Their Approved Product (AP) seal means products are safe to use as intended. Avoid products with the seal Caution Label (CL) or any warning or hazard label.

- Keep the art room well ventilated (open windows and use fans if chemical odors become very noticeable).
- Avoid permanent or waterproof markers.
- Look for water-based art supplies (markers and paint) with the AP label.
- For more details about possible hazardous ingredients in the art supply you can request the Materials Safety Data Sheet (MSDS) of the product from the manufacturer.
- Consider preparing your own art materials for the toddler art class since this age group frequently puts objects in their mouths. You can use natural ingredients (powdered herbs, vegetables, and fruits) to make paints and use homemade recipes for other art supplies such as modeling materials and glue.
- Keep a watchful eye during art time to avoid harmful exposures.
- Prohibit food or drinks during art class.
- Make sure children wear protective clothing and wash hands after using art materials.
- Do not use harsh chemicals such as paint removers, acetone, or gasoline to remove paint stains on skin.
- Organize toys and art supplies in separate containers.

Where can you get additional information?

- Eco Healthy Child Care: http://www.cehn.org/our-work/eco-healthy-child-care/ehcc-factsheets/download-ehcc-factsheets/#wpcf7-f2108-p966-o2
- Office for Environmental Health Hazard Assessment, California EPA: Arts Smarts at: http://www.oehha.ca.gov/education/art/ArtHazardsGuide.pdf.
- U. S. Consumer Product Safety Commission: Art and Craft Safety Guide at: http://www.cpsc.gov/PageFiles/112284/5015.pdf.

Cleaning Products

There are many reasons to use cleaning products, which can be used for cleaning, disinfecting, and sanitizing. The following are their descriptions:

Cleaning removes germs, dirt, and impurities from surfaces or objects. Cleaning works by using soap (or detergent) and water to physically remove germs from surfaces. It does not necessarily kill germs, but by removing them, it lowers their numbers and the risk of spreading infection.

Disinfecting kills germs on surfaces or objects. Disinfecting works by using chemicals to kill germs on surface objects. This process does not necessarily clean dirty surfaces, but it will kill germs on a surface after it has been cleaned.

Sanitizing lowers the number of germs on surfaces or objects to a safe level, as judged by public health standards or requirements. This process **works by either cleaning or disinfecting** surfaces or objects.

How can children be exposed to cleaning products?

- Breathing vapors from sanitizing and disinfecting products.
- Touching or putting items into their mouth that have been sanitized or disinfected can expose children to residual chemicals.

What are the dangers of cleaning products?

- Children who breathe hazardous chemicals daily may develop asthma or may worsen existing asthma conditions.
- Exposure can cause eye irritation.
- Touching some chemicals found in harsh sanitizing or disinfecting products can cause skin irritation or worsen skin problems.

- Cleaning products can be poisonous and fatal if ingested.

How can you reduce children's exposure to chemicals in cleaning products?

- If you use bleach in your facility consider the following tips:
  - Clean with an all-purpose soap and water before bleach is applied.
  - Treat bleach as a hazardous chemical. Use gloves and make appropriate dilutions daily in a well-ventilated area away from children. A sanitizing solution recommended for household surfaces and items contains 1 cup of bleach for every 5 gallons of water.
  - Apply to surfaces according to manufacturers' labels.
  - Do not mix chlorine bleach, or any cleaner containing chlorine, with ammonia or with a cleaner containing ammonia; it can create a toxic gas.
  - Do not mix bleach with dish soap solution. That will inactivate the disinfectant properties of the bleach.
- Sanitizers used for food-contact surfaces should be used by following approved methods stated in Idaho Administrative Procedures Act (IDAPA) 16.06.02.360 (http://adminrules.idaho.gov/rules/current/16/0602.pdf).
- For non-food contact sanitizers, it would be advisable to adopt a green cleaning option. Less harsh sanitizing and disinfectant products are available. These products are certified by a third party:
  - EPA's Safer Choice label.
  - Green Seal: independent nonprofit organization.
  - EcoLogo: program of underwriter's laboratory based in Canada.

- Look for EPA registration number on disinfectants and sanitizers. Consider using EPA registered sanitizers that use hydrogen-peroxide or other safer chemicals as the main ingredient.
- Read labels on all cleaning products and avoid the products with a poison, danger, or warning sign.
- Do not let children use the cleaning products.
- Let all surfaces dry completely before allowing children to play with or use cleaned items.

Where can you get additional information?

- Environmental Protection Agency's Safer Choice label at: http://www2.epa.gov/saferchoice.
- Center for Environmental Research and Children's Health at:
- http://cerch.org/wp-content/uploads/ECE-Curriculum_Final.pdf.

FORMALDEHYDE

Formaldehyde is a colorless, flammable gas with a strong smell. It is one chemical found in the large family of VOCs. It is used in the production of paper, fertilizers, plywood, particleboard, fiberboard, carpets, and textiles. It is also present in household products such as antiseptics, medicines, and cosmetics. It is very soluble in water and in a liquid form it may be used as a preservative in household cleaning products. Automobile exhaust, smoke, paints, and varnishes also contain formaldehyde gas.

How are children exposed to formaldehyde?

- Breathing air when recent renovations are made in child care facilities. For example, when the facility is repainted, new carpets, new plywood, or particleboard furniture is installed, or when old furniture is repainted inside the facility formaldehyde is released from these products.

- Breathing contaminated air if the child care facility is located close to an industrial facility that produces paper, wood products, carpets, and textiles or if the child care facility is located in an urban area with heavy traffic.
- Breathing air from cigarette or wood smoke (See details under the smoke subsection).

What are the health effects of formaldehyde in children?

- Breathing a lot of formaldehyde can make children sick and they can show the following symptoms: sore throat, cough, scratchy eyes, nosebleeds,

nose irritation, wheezing, fatigue, skin rashes, and in rare cases, serious allergic reactions.

- Formaldehyde is a probable carcinogen; breathing low levels for a period of several months or more (as in the exposure situations mentioned above with poor ventilation) may increase chances of a child developing cancer.

How can you reduce children's exposure to formaldehyde?

- Check labels and buy low-VOC products.
- Plan renovations for weekends during spring or fall when doors and windows can be opened to let the air circulate inside the facility; you can also use a fan to help circulate the air.
- Let the facility be unoccupied for a minimum of three days after renovations or after purchasing new furniture.
- Open windows after installing new building materials or furniture to ventilate the rooms.
- If possible allow factory-new furniture, mattresses, and sleeping mats to air out for several days before putting them to use (especially if there is a noticeable chemical odor).
- Ask the carpet installer to clean with hot water extraction to get rid of formaldehyde and other chemical smells. If possible have the facility closed for a few days.
- See the smoke subsection for tips to reduce health effects from formaldehyde present in cigarette smoke, smoke from wild fires, and automobile exhaust.

Where can you get additional information?

- Agency for Toxic Substances and Disease Registry: ToxFAQs Formaldehyde at: http://www.atsdr.cdc.gov/toxfaqs/tfacts111.pdf.
- Environmental Protection Agency; Formaldehyde at: http://www2.epa.gov/formaldehyde.

SECTION 2: TOXIC METALS

Certain metals present in nature can be toxic and can cause harmful health effects when there is contact with them. Some metals can build up in an individual's body when that person is exposed to them on a regular basis. Toxic metals that may be present at child care facilities include, but are not limited to arsenic, lead, and mercury.

ARSENIC

Arsenic is a poisonous mineral that has two sources:

1. It is naturally present in soil, bedrock, and water. Elevated levels of arsenic occur naturally in groundwater in many areas of Idaho.
2. Several industrial activities use arsenic and its compounds to manufacture metals, glass, electronic components, pesticides, and it is used as a wood preservative. Chromated Copper Arsenate (CCA) is a common wood preservative.

How can children come into contact with arsenic?

Arsenic can be found in water, soils, and wooden outdoor play equipment. Children are most likely to be exposed by:

- Drinking water with arsenic.
- Touching wooden outdoor equipment (play sets, railings, decks, and picnic tables) made with CCA treated wood, particularly when wood is wet or was recently cleaned with bleach.

- Breathing dust from soils contaminated with arsenic.
- Accidently swallowing dust contaminated with arsenic.

Children who attend child care facilities located near a mining area, an industrial facility, an area with naturally elevated levels of arsenic or agricultural area (for example: former apple orchard farm where pesticides

made with arsenic were applied) have higher chance to come in contact with arsenic.

What are the health effects of arsenic?

- Touching arsenic may cause eye and skin irritation.
- Breathing high levels of arsenic can irritate your throat and lungs.
- Eating or drinking very high levels of arsenic can result in death. Exposure to lower levels can cause nausea and vomiting, abnormal blood cell counts, abnormal heart function, and a sensation of "pins and needles" in hands and feet.
- Eating, drinking, or breathing low levels of inorganic arsenic for a long time
    - Can cause darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso.
    - Is associated with developmental effects, cardiovascular disease, neurotoxicity and diabetes.
    - Can increase the chances of developing certain types of cancer (including liver, bladder, kidneys, prostate, skin, and lung).
    - May lead to hearing loss, a weak immune system, and there is some evidence that it may result in lower intelligence.

How can you reduce children's exposure to arsenic?

- Children should wash their hands frequently after playing outdoors, before eating or drinking, and before sleeping.
- Discourage children from putting their hands in their mouths or engaging in other hand-to-mouth activities.
- Encourage children to eat and drink indoors instead of outside. If a picnic or any other activity is planned outdoors, use table cloths on top of wooden tables.

- Use floor mats at all entrances to prevent soil being tracked indoors and dust, mop, and vacuum the day care facility regularly.
- If the child care facility has an infant room it would be advisable for all staff and parents entering the infant room to take off their street shoes and wear socks, slippers, inside-only shoes, or shoe covers over street shoes.
- Seal existing CCA-treated structures (playgrounds, picnic tables, decks, railings) with water-based sealants. Latex should be reapplied every year, depending on local climate.
- Avoid using bleach or other chemical brighteners to clean CCA-treated product. This can cause more arsenic to come to the surface of the wood resulting in a potential exposure for the child.

Where can you get additional information?

- Agency for Toxic Substances and Disease Registry at: http://www.atsdr.cdc.gov/toxfaqs/tfacts2.pdf
- Consumer Product Safety Commission at: http://search.cpsc.gov/viewer/index.jsp?start=0&proxy=%2F&sessionid=8f5ca7d2-2310-4d46-9ca6-1476a8558282

LEAD

Lead is present in small amounts in the earth's crust combined with other materials. The most common source of lead poisoning in children is lead-based paint. Lead-based paint is commonly found in homes built before 1960, but may also be present in houses built before 1978, the year it was phased out of production for house paint. Lead-based paint is most commonly found on windows, trim, doors, railings, columns, porches, and exterior walls.

Other sources of lead include:

- Road dust from areas with high traffic because lead was used as an additive of gasoline until the 1980s.
- Mining or industrial activities where lead is used.
- Incineration of lead-containing waste.
- Cultural folk remedies used to treat upset stomachs such as "greta" and "azarcon."
- Inexpensive cosmetic jewelry.
- Imported toys produced with lead-based paint.
- Ceramics made with a glaze containing lead.
- Drinking water that is in contact with lead pipes or fixtures containing lead.

How can children come into contact with lead?

- Drinking water with lead.
- Living in a home or attending child care facilities built before 1978 or are located near a mining or industrial area, a landfill, or a busy highway.
- Breathing or swallowing lead dust

when playing with dirt outdoors or touching floors, windows, or walls with lead-based paint.

- Eating paint chips, dust, or soil containing lead from deteriorated lead paint.
- Touching or putting toys or costume jewelry that is contaminated with lead in their mouths.

What are the health effects of lead exposure in children?

Children who come in contact with high lead levels for a short time can show the following symptoms: colic, constipation, fatigue, anemia, poor concentration, irritability, lack of energy, and poor appetite. In worse cases it can cause kidney damage, permanent brain damage, coma, convulsions, and death.

Children who come in contact with low lead levels for a long time can show the following symptoms:

- Behavioral and learning problems (low intelligent levels).
- Hyperactivity.
- Slowed growth.
- Hearing damage.
- Kidney and liver damage.
- Impaired speech.

Lead poisoning is difficult to diagnose because symptoms are similar to those of other illnesses. The only way to know if a child has lead poisoning is by having the child tested. It is recommended to test lead blood levels in children younger than five years of age if they live in old houses (built before 1978), attend day care facilities built before 1978, or have parents working in places where they use lead. Examples of workplaces with lead include smelting and refining metals, gun firing ranges, glass production, demolition

work, automotive repair, battery manufacturing, making pottery, painting, and/or remodeling of homes built before 1978.

How can you reduce children's exposure to lead?

If the child care facility was built **before 1978** it is recommended to hire a professional to test for the presence of lead and have a licensed contractor to do any renovations when you notice chipping or peeling paint inside or outside the facility.

To prevent children touching, breathing, or swallowing lead-based paint before renovations take place you can:

- Make sure children do not have access to peeling paint or chewable surfaces such as window sills.
- Discourage children from putting their hands in their mouths or engaging in other hand-to-mouth activities.
- Make sure children wash their hands after playing outside and before eating, drinking, or sleeping.
- Provide sandboxes instead of letting children play with dirt outdoors.
- Wet mop floors and horizontal surfaces with a microfiber towel and all-purpose cleaner two times per week.
- Avoid dry sweeping of surface dust and debris, shaking carpets or rugs, and using abrasive cleaners on deteriorated paint.
- Use a HEPA (High Efficiency Particulate Air) vacuum cleaner when paint is peeling or chipping.
- Avoid lead poisoning from toys by checking frequently the consumer product safety commission for recalls of toys that may contain lead (http://www.cpsc.gov/en/Recalls).

Where can you get additional information?

- Agency for Toxic Substances and Disease Registry at: http://www.atsdr.cdc.gov/toxfaqs/tfacts13.pdf.
- Centers for Disease Control and Prevention at: http://www.cdc.gov/nceh/lead/default.htm.
- Environmental Protection Agency at: http://www2.epa.gov/lead.

MERCURY

Mercury is present in the environment in three forms (metallic, organic, and inorganic). The form found in mercury spills is elemental mercury which is not naturally found in the environment. Elemental mercury is a shiny, silver colored metal that is liquid at room temperature and evaporates faster as the room temperature increases. Elemental mercury was used in some instruments such as old-fashioned fever thermometers or barometers and some antiques such as mercury lamps, mirrors, and clocks. Elemental mercury is also used in some consumer products such as batteries, electrical switches, and fluorescent bulbs. When mercury is spilled it creates harmful vapors if not cleaned properly. Mercury spills can leave mercury behind for several years and continue to produce dangerous mercury vapors if not addressed by professionals.

How can children come into contact with mercury?

- Breathing harmful vapors, handling, or playing with mercury after a mercury spill from broken instruments, antiques, and consumer products that contain mercury.
- Putting in their mouths or accidentally swallowing batteries, such as button cell batteries used in calculators, watches, hearing aids, and toys.

What are the health effects of mercury in children?

- Small amounts of mercury from a broken thermometer or fluorescent bulb are unlikely to cause health problems if the spill is quickly and properly cleaned up and disposed.
- Breathing high levels of mercury vapors for a short time can cause: coughing, difficulty breathing, chest pain, nausea, vomiting, diarrhea, fever, a metallic taste in the mouth, skin rash, and eye irritation.

- Breathing low levels of mercury vapors for a long time can cause shakiness, loss of appetite and weight loss, irritability, shyness, tremors, changes in vision or hearing, and memory problems.

How can you reduce children's exposure to mercury?

1. Check for any mercury containing devices at the child care facility. All the mercury containing items (fever thermometers with the silver liquid, barometers, old thermostats, electrical switches, fluorescent bulbs) should be disposed of properly.
2. Use electronic (digital) or red alcohol thermometers.
3. Make sure that all toys at the day care facility do not have button cell batteries and all staff's personal belongings are out of the reach of children.
4. Be mindful when asking older children to bring items from home for activities such as "show and tell". Some antique items and imported jewelry may contain mercury and can be accidentally broken and contaminate the child care facility.

Cleaning a Mercury Spill: Listed below are the first steps to take to address a mercury spill. **See Appendix A** for details on mercury spill cleanup.

- Do not touch the mercury.
- Keep people and pets out of the spill area.
- Shut off the heat and cooling system in the affected area.
- If possible open windows to let air circulate at least for 24 hours.
- Do not vacuum or sweep.

If you have a spill larger than two tablespoons:

- Call 911 to activate Idaho's Emergency Response Network.
- Call the National Response Center (NRC) at (800) 424-8802.

Where can you get additional information?

- Agency for Toxic Substances and Disease Registry at: http://www.atsdr.cdc.gov/dontmesswithmercury/pdfs/mercury-spill-instructions.pdf.
- Environmental Protection Agency at: http://www.epa.gov/mercury/spills/.
- Idaho Department of Environmental Quality at: https://www.deq.idaho.gov/waste-mgmt-remediation/hazardous-waste/mercury/what-to-do-if-you-have-a-spill/

SECTION 3: PESTICIDES

Pesticides include a wide variety of poisons useful for destroying, repelling, or controlling plant or animal pests (such as weeds, mold, insects, rats, mice, bacteria, and worms). A nation-wide study shows 63% of child care facilities use pesticides so it is likely that children can come into contact with pesticides at daycares.[3]

According to the Idaho Department of Agriculture common pesticides applied in residential settings in Idaho include:

- Insecticides: **Talstar** (destroys termites), **Tempo** (kills flying and crawling insects), and **Merit** (destroys termites and chewing insects).
- Herbicides: **Round-up** (weed killer), and **2,4-D** (kills weeds, but not grass).

[3] Tulve N. S., Jones P.A., Nishioka M.G., Fortmann R.C., Croghan C.W. ,Zhou J.Y. , Fraser A., Cave C., Friedman W. 2006. Pesticide Measurements from the first National Environmental Health Survey of Child Care Centers Using a Multi-Residue GC/MS Analysis Method. *Environmental Science and Technology* 40(20) 6269-6274.

How can children be in contact with pesticides?

- Touching pesticide contaminated surfaces (floors, carpets, soil, sand box, and playground) and putting their hands in their mouths.
- Breathing contaminated air, eating pesticide contaminated food, or drinking pesticide contaminated beverages.
- Skin exposure from touching contaminated surfaces (floors, carpets, soil, sand box, and playground)

Children are more likely to come in contact with pesticides if:

- They have been recently used indoors or outdoors of the child care facility.
- They are not stored properly (in a locked room and in the original container).
- A recent aerial pesticide application has occurred near the child care facility. The application could be crop spraying or spraying for mosquitos by the county abatement programs. In Idaho, pesticide spraying for mosquito abatement is done almost exclusively by truck. Only in certain situations (such as increases in West Nile carrying mosquitos) and with proper public notification will aerial applications occur in urban areas of Idaho.

What are the health effects of exposure to pesticides?

- Touching pesticides can cause temporary tingling, itching, burning, or numbness of the skin, and eye irritation.
- Breathing pesticides can irritate the nose, throat, and lungs.
- Eating or drinking pesticides can cause sore throat, nausea, stomach ache, vomiting, irritability, excessive salivation, uncoordinated walking, tremors, convulsions, and death.

How can you keep your building free of pests without pesticides?

- Do not let pests inside the building:
    - Install door sweeps.
    - Replace old door and window screens.
    - Fix holes and cracks in exterior walls.
- Keep the child care facility clean and organized
    - Clean up food and drink spills right away.
    - Store food in tightly sealed containers.
    - Encourage staff and children to eat in the dining area only.
    - Make sure trash containers have a tight cover and are thoroughly clean before replacing the trash bag.
- Recycle waste paper and cardboard.

How can you reduce children's exposure to pesticides?

- Encourage good hygiene habits, such as washing hands before meals.
- If you hire a pest control company, choose one that offers integrated pest management services (IPM). IPM is an ecosystem-based strategy that focuses on long-term prevention of pests while minimizing risks to people and the environment.
- If you use chemical products:
    - Follow the label's instructions.
    - Keep the pesticide in its original container.
    - Keep children out of areas with recent pesticide treatment.
    - Notify parents when the pesticide application is scheduled.

Where can you get additional information?

- National Pesticide Information Center (NPIC) at: http://npic.orst.edu.
- Environmental Protection Agency at: https://www.epa.gov/safepestcontrol/reduce-your-childs-chances-pesticide-poisoning

- If a child is exposed to pesticides call the Regional Poison Control Center at 1-800-222-1222. Make sure to have the name of the pesticide handy.

SECTION 4: TOXIC GASES AND FUMES

Many people die every year as a result of breathing in harmful gases and fumes. These chemicals can be found in industrial environments and in nature. They can be odorless, colorless, and generally invisible to the naked eye. Harmful gases and fumes that may be present at childcare facilities include but are not limited to carbon monoxide, radon, ozone, and smoke.

Carbon Monoxide

Carbon Monoxide (CO) is a colorless, odorless, tasteless, non-irritating gas produced whenever a fuel such as wood, charcoal, gasoline, oil, kerosene, propane, or natural gas is not burned properly. Vehicle emissions and tobacco smoke are also sources of CO.

How are children exposed to carbon monoxide at a child care facility?

- Breathing gases from cars left running inside a closed garage or vehicles idling outside the building near open windows.
- Breathing gases from faulty appliances such as furnaces, wood burning stoves, gas water heaters, and gas stoves.
- Breathing gases from portable heating appliances or gas powered tools used inside rooms with poor ventilation.

What are the health effects of carbon monoxide?

- CO reduces the delivery of oxygen to the body's organs and tissues.
- Breathing small amounts of CO can cause flu-like symptoms: mild headache and weakness, dizziness, sleepiness, shortness of breath, tightness in the chest, nausea, and vomiting.
- Children breathing high levels of CO may experience bright cherry-red lips, pale or bluish skin, and lack of muscle coordination. Severe CO poisoning may cause confusion, hallucinations, seizures, permanent brain injury, coma, and death.

How can you reduce children's exposure to carbon monoxide?

- Install CO detectors at each level of the child care facility.
- Have a qualified technician inspect, clean, and adjust all gas appliances and chimneys every year; preferably in the fall.

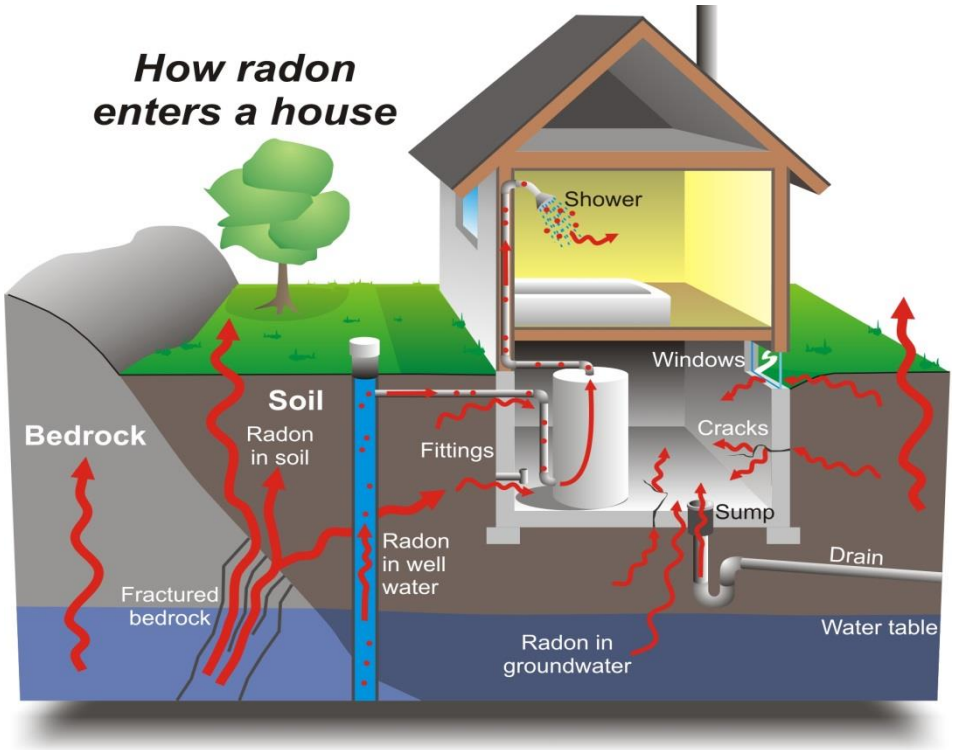
- Purchase gas appliances that vent their fumes to the outside of the facility and have them installed by a trained professional.
- Do not leave a car, motorcycle engine, a gas powered tool, or generator running inside a closed garage or near an open window outside of the facility.
- Avoid using gas stoves or ovens to heat the child care facility.
- Portable heating devices and grills should not be used inside the child care facility.
- See the smoke subsection of this document for more tips to avoid carbon monoxide.

Where can you get additional information?

- Agency for Toxic Substances and Disease Registry (ATSDR): ToxFAQs Carbon Monoxide at: http://www.atsdr.cdc.gov/toxfaqs/tfacts201.pdf.

RADON

Radon is a naturally occurring gas that is invisible, odorless, tasteless, and radioactive. It comes from the breakdown of uranium and thorium from rocks, soils, and groundwater and gets into the air you breathe. In Idaho, radon is very common throughout the whole state because of the presence of rock formations that are rich in uranium. Radon gas gets into homes and buildings through gaps and cracks in the foundations or walls. High levels of uranium or thorium in the rock, soil, or groundwater in your area, increase the chances of high radon levels inside homes and buildings.



How are children exposed to radon at a child care facility?

- Breathing radon-contaminated air inside the child care facility. Crawling children who spend several hours on the floor inside the child care facility are at most risk.

- Childcare facilities at a higher risk for radon exposure include those with basements used as playing spaces or where children spend long hours. Children breathe more radon in child care facilities located in areas with high radon levels.

What are the health effects of radon in children?

- The health concern is lung cancer. Radon breaks down into radioactive particles. These particles release bursts of energy in the lungs and cause damage to the lung's cells. This damage to lung cells can lead to cancer.
- Lung cancer is not common in children. However, breathing radon during childhood and being around people who smoke (second hand smoke), may increase the chances of children getting lung cancer later in life.
- Radon exposure does not produce any symptoms.

How can you reduce children's exposure to radon?

- Testing for radon is the only way to know if children are breathing radon at the child care facility.
- Testing for radon is simple. For details where to purchase a radon kit and interpretation of your results you can visit Indoor Air Environment Program or call the Idaho Department of Health and Welfare's Indoor Environment Program at 1-800-445-8647.
- Install radon mitigation in your child care facility if the levels are at or above the EPA action level of 4 picocuries per liter of air (4 pCi/L).

Where can you get additional information?

- Agency for Toxic Substances and Disease Registry (ATSDR): ToxFAQs Radon at: http://www.atsdr.cdc.gov/toxfaqs/tfacts145.pdf.
- Environmental Protection Agency (EPA): Radon at: http://www.epa.gov/radon/.

OZONATORS

Ozonators, sold as air purifiers, are devices for producing ozone and circulating it in the air of a room to help control bad smells. Ozone is a strong lung irritant in indoor environments where it can combine with other air pollutants to create more toxic chemicals. Ozone high up in the atmosphere protects us from the sun's radiation, but ozone at ground level is harmful. Ozonators are not effective in controlling indoor air pollutants (smoke, mold spores, dust, bad smell, and particulates). Ozonators can produce unsafe levels of ozone indoors and have not been approved by the federal government to be used in indoor occupied spaces.

How can children be exposed to ozone at a child care facility?

- Children can breathe ozone if ozonators are used inside the child care facility.

What are the health effects of ozonators in children?

- Breathing ozone indoors at high levels for a short time in children can cause damage to the lining of the nose, throat, and lungs.
- Breathing ozone even at low levels for a long time can cause breathing problems, a high chance of respiratory infections, inflammations, chronic obstructive pulmonary disease (COPD), and decreased lung function in babies.

How can you reduce children's exposure to ozone inside the child care facility?

- Avoid using ozone generating air cleaners. Ozone generators cause indoor air pollution and do not clean indoor air.
- Treat the source of the bad smell.
- Avoid using air fresheners and other chemical products to hide the bad smell. These chemicals will mix with ozone and produce more toxic air pollutants that are harmful for human health.
- Keep the child care facility well ventilated.
- Maintain the heating, ventilation and air conditioning (HVAC) system at least once per year. If your HVAC system can use HEPA grade air filters use them. If you do not have a central HVAC or your HVAC cannot handle HEPA filters you can purchase a portable filtration unit (room air cleaner) to reduce smoke, dust, and pollen particles from the air.

Where can you get additional information?

- Environmental Protection Agency: Ozone Generators That Are Sold as Air Cleaners at: http://www.epa.gov/indoor-air-quality-iaq.
- California Air Resources Board: Certified Air Cleaning Devices for the Home at: http://www.arb.ca.gov/research/indoor/aircleaners/certified.htm http://www.arb.ca.gov/research/indoor/acdsumm.pdf.

SMOKE

Smoke is produced when something is burning. Smoke contains carbon monoxide, tiny smoke particles, organic gases, formaldehyde, and nitrogen oxides.

How are children exposed to smoke?

- Playing outdoors when wildfire smoke is in the air.
- Breathing indoor cooking fumes (for example burned food).
- Breathing car exhaust particularly during inversions in winter months, rush hour traffic and from being near idling cars.
- Breathing someone's tobacco smoke (second hand smoke).
- Breathing smoke from fireplaces and wood burning stoves.

What are the health effects of smoke in children?

Breathing in smoke for a short time can:

- Reduce lung function in children.
- Worsen existing diseases (asthma, bronchitis, sinusitis, pneumonia, emphysema).
- Irritate eyes, throat, sinuses, and/or lungs.
- Trigger headaches and allergies.

Breathing in smoke for a long time can cause:

- Chronic lung disease.
- Chronic bronchitis.

The tiny smoke particles are especially harmful to human health because these particles are so small that our bodies cannot filter them out.

How can you reduce children's exposure to smoke?

- Reduce the amount of time children play outdoors when the air quality is bad. (See the Ozonators subsection for tips to purchase an air cleaning device).
- Make sure that the HVAC system at the child care facility is maintained regularly by replacing filters and dusting vents.
- When cooking microwaveable items use kitchen and stove fans. When food items are burned open windows and doors and let children play outside until smoke inside goes away.
- To minimize car idling, one option is to join the voluntary Clean Zone IDEQ program. More information is available at: https://www.deq.idaho.gov/media/409808-caz_community.pdf.
- According to Idaho State Law [Title 39, Chapter 11, (8)] smoking is not allowed in child care facilities during the hours of child care facilities' hours of operation. Also, under Idaho Administrative Procedures Act (IDAPA) 16.06.02.360.16 (http://adminrules.idaho.gov/rules/current/16/0602.pdf) children must be allowed a smoke free environment during all daycare hours indoors or outdoors. A child care manager must apply these laws at the child care facility.

Where can you get additional information?

- The Pediatric Environmental Health Unit has information about health risks of wildfires for children at: http://www.pehsu.net/HealthProf_Acute_Risk_of_Wildfires.html

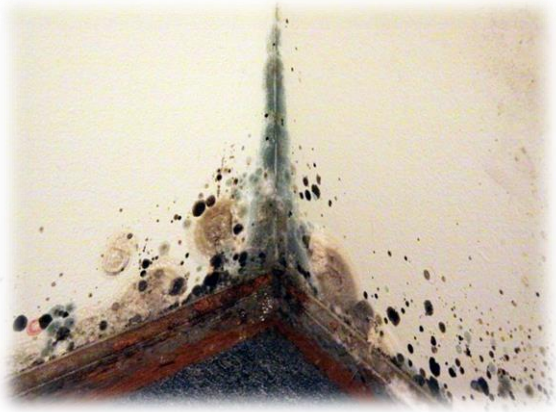
- The Centers for Disease Control and Prevention at: http://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/general_facts/.

SECTION 5: BIOLOGICAL CONTAMINANTS

Biological contaminants are living organisms or parts of living organisms such as mold, dust mites, and pet dander. They reduce healthy indoor air quality and may be a major cause of sick days for children.

MOLD

Molds are fungi found in outdoor and indoor environments. Key ingredients for molds to grow include: relative humidity of at least 60%, something to feed on (e.g., wood, organic fibers, dust, plants, and rotten food), darkness, and temperatures that humans prefer, about 70 degrees Fahrenheit (° F). Although 70° F is an ideal temperature, some molds can survive low temperatures (for example inside your refrigerator) or high temperatures like those in the tropics. Molds can look white, black, gray, green, blue, brown, and yellow. They multiply by producing tiny spores. They are normally not an issue indoors unless they land on wet surfaces. Some spores also cause allergic reactions.



How can children be exposed to mold?

Breathing moldy air when the facility has some of the following issues:

- An ignored leak problem in the facility (bathroom, kitchen, roof) that causes moisture.
- A recent flooding inside the facility.
- An inadequate ventilation system and high relative humidity.
- A lack of cleanliness at the facility.

What are the health effects of mold on children?

- Breathing mold-contaminated air at the child care facility can cause nasal congestion, sneezing, runny or itchy nose, throat irritation, coughing, and wheezing.
- Touching molds can cause a skin rash and allergies.

- Coming in contact with mold can worsen existing health conditions, such as asthma, sinusitis, bronchitis, and eczema.
- Children with weak immune systems may have higher chances of developing respiratory diseases.

How can you reduce children's exposure to mold?

- If you notice a moldy or musty smell it is possible you have mold growing inside the facility.
- Check for leaks and find the source of the problem and have a professional fix leaks as soon as possible.
- Maintain relative humidity inside the building below 60%.
- Clean spills immediately and dust frequently.
- Check your HVAC system and maintain a good ventilation system.
- Open doors and windows to let air circulate during spring and fall months.
- Do not allow children to play in areas with visible mold. Isolate the area and clean it.

How can I clean mold inside the child care facility?

Once your leak is fixed, the next step is to clean the mold. If you notice a small area (three feet by three feet) covered with mold you can clean it yourself. Here some tips to clean a small moldy area:

- Wet the area and close doors to stop mold spores from spreading throughout the child care facility.
- Use protection: a face mask (N-95 is recommended), rubber gloves, and goggles without holes to protect your eyes from mold spores.
- Use detergent and water to scrub off mold from hard surfaces and dry completely (24 to 48 hours). In the case of carpet or ceiling tiles it is recommended to get rid of the moldy materials because it may be difficult to remove mold completely.

- A bleach solution may be used on surfaces after mold and any detergent has been removed. If you use bleach be sure to ventilate the room to reduce irritation to the lungs.
- If you want to paint the moldy area it needs to be dry and free of mold before painting.

When should I get a contractor to take care of my mold problem?

It would be advisable to hire a professional to clean mold when:

- Mold covers a large area (more than three feet by three feet).
- You can smell it, but you cannot see it (hidden mold).
- Water damage is caused by sewage leak.
- Water leaking is discolored and/or has a strange odor.
- Long-term issues with mold are affecting the integrity of the child care facility.

You can find a list of contractors in your area under "mold removal and remediation" on the internet or in the yellow pages. If you decide to use a contractor, review the references and request that they follow the guidelines of the American Conference of Governmental Industrial Hygienists (ACGIH) and EPA's Mold remediation in Schools and Commercial Buildings Guidance.

Is it necessary to test for mold?

- In most cases testing is not needed. In some cases it can be useful to test to make sure the clean-up was done properly.
- The Centers for Disease Control (CDC) and the Environmental Protection Agency (EPA) do not recommend testing.

In the United States there are no federal standards for mold. In addition, mold is not regulated by any agency in Idaho. Thus, it makes very difficult to interpret mold test results.

Where can you get additional information?

- The Idaho Indoor Environment Program at 1-800-445-8647 or visit http://healthandwelfare.idaho.gov/Health/EnvironmentalHealth/IndoorEnvironment/Mold/tabid/940/Default.aspx
- Environmental Protection Agency at: http://www.epa.gov/mold/.
- Centers for Disease Control and Prevention at: http://www.cdc.gov/mold/.

Dust Mites and Pet Dander

Dust mites are tiny animals related to spiders and are found in furnishings, bedding, clothes, and stuffed animals feeding on dead human or animal skin. It is their fecal matter and body fragments that cause allergic reactions. Pet dander includes tiny flecks of skin shed by cats, dogs, rodents, birds, and other animals with fur or feathers. It can stick to furniture, bedding, fabrics, and other objects. Pet dander can also cause allergic reactions.

How can children be exposed to dust mites and pet dander?

Children are exposed by breathing or touching allergens from dust mites and pet dander present on furniture, stuffed animals, bedding, carpet, dusty toys, and dusty surfaces.

What are the health effects of dust mites and pet dander in children?

- Breathing allergens from dust mites and pet dander in children can cause allergy symptoms: sneezing, runny nose, itchy, red, or watery eyes, nasal congestion, itchy nose, and cough. It can worsen asthma symptoms.
- Touching allergens from dust mites or pet dander can cause skin irritation and eczema.

How can you reduce children's exposure to dust mites and dander?

- Remove dust from hard surfaces with a damp cloth.
- Vacuum carpets and fabric-covered furniture weekly using a vacuum cleaner with a HEPA filter.
- Purchase washable stuffed toys.
- Use blankets made of cotton or synthetic fiber for children's daily naps and wash them weekly using hot water. Blankets and bedding must not be shared. Blankets must be stored separately to prevent cross contamination.

- Wash bedding materials with hot water and use dust proof covers on pillows and mattresses.
- Use fitted sheets to reduce the accumulation of human skin on top of mattresses.
- Reduce the amount of time pets spend inside at the child care facility, especially infant rooms and nap rooms.
- Eliminate or reduce fabric wall hangings, curtains, and drapes.

Where can you get additional information?

- The Centers for Disease Control and Prevention at: http://www.cdc.gov/asthma/triggers.html
- American Lung Association at: http://www.lung.org/healthy-air/home/resources/pet-dander-1.html

SECTION 6: OTHER HAZARDOUS MATERIALS

Hazardous materials are chemicals that may cause harm to an individual if it enters the body. Common ways that these materials can enter the body are through inhalation, skin contact, and ingestion. The hazardous materials that are most commonly present at child care facilities are asbestos and flame retardants.

ASBESTOS

Asbestos is the name for a group of different mineral fibers. These fibers are tiny, they do not dissolve in water or evaporate, they are resistant to heat and fire, and they cannot be destroyed by chemicals or biological ingredients. Natural asbestos is present in serpentine rock and can be released when the rock is broken or crushed. In the late 1970s the U.S. Consumer Product Safety Commission (CPSC) banned the use of asbestos in some consumer products and in 1989; EPA issued a final ban for most asbestos-containing products. The most common type of asbestos is chrysolite which was used in commercial products (insulation, ceiling, patching compounds, texture paints, and floor tiles).

How can children be exposed to asbestos?

Children can breathe in tiny asbestos fibers at a day care facility when:

- Asbestos-containing materials are deteriorated and falling apart.
- Repairs and improvements have disturbed asbestos-containing materials.
- Asbestos has been brought inside on shoes, clothes, hair, pet fur, or other objects from asbestos contaminated locations.

What are the health effects of asbestos in children?

Breathing high levels of asbestos over a long time can cause:

- Asbestosis which is a lung disease characterized by progressive shortness of breath, a persistent cough, and chest pain.
- Thickening of the lining covering the lungs and chest cavity causing shortness of breath and decreased lung function.
- Lung cancer; smoking and exposure to second hand smoke increases the chances of developing lung cancer.
- Mesothelioma, a rare form of lung cancer.

Cases of mesothelioma in children are very rare. Cases may develop from playing outdoors in areas with elevated asbestos or having parents who work with asbestos.

How can you reduce the exposure of children to asbestos?

- If the child care facility was built before 1970 it is advisable to hire a professional to inspect the building for deteriorating asbestos-containing materials and to take care of any renovations.
- Make sure children play in outdoor areas covered with grass, wood chips, mulch, pea gravel, grass, or asphalt.
- Use doormats to prevent soil being tracked into the facility.
- Keep windows and doors closed on windy days and during construction in areas nearby.
- Establish a no-street shoe policy for the infant room.
- Vacuum floors often using a HEPA vacuum cleaner.

Where can you get additional information?

- Agency for Toxic Substances and Disease Registry (ATSDR): ToxFAQs at: http://www.atsdr.cdc.gov/toxfaqs/tfacts61.pdf.
- Environmental Protection Agency at: http://www2.epa.gov/sites/production/files/documents/abcsfinal.pdf.

FLAME RETARDANTS

Flame-retardants are chemicals added to consumer products to reduce or delay the growth of fire. Flame-retardants are commonly present in a wide variety of consumer products, including foams and plastics used in home furnishings, children's products, and electronics.

How can children be exposed to flame retardants?

Children are exposed by breathing dust contaminated with flame-retardants, eating food contaminated with flame retardants, or touching or putting in their mouths products that contain flame retardants.

What are the health effects?

Having contact with flame retardants for a long time can cause allergic reactions. They can cause brain lesions, decreased fertility, and changes in thyroid hormone levels. Children who come in contact with flame-retardants before birth can have reduced physical and mental development.

How can you reduce children's exposure to flame retardants?

- Fix any tears in old couches and upholstered furniture, mattresses, pillows, and pads or purchase a new one preferably filled with cotton, wool, or polyester.
- Damp mop dusty surfaces and use a HEPA vacuum cleaner frequently.
- Have children wash their hands frequently, particularly before meals.
- If possible purchase flame retardant free products.

Where can you get additional information?

- Centers for Control Disease and Prevention (CDC): Polybrominated Diphenyl Ethers (PBDEs) and Polybrominated Biphenyls (PBBs) Fact

Sheet at: http://www.cdc.gov/biomonitoring/PBDEs_FactSheet.html and http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=900&tid=183

- Agency for Toxic Substances and Disease Registry (ATSDR): ToxGuide for Phosphate Ester Flame Retardants at: http://www.atsdr.cdc.gov/toxguides/toxguide-202.pdf.
- Consumer Product Safety Commission (CPSC) for relevant information regarding many of these items at: http://www.cpsc.gov/.

Notes

APPENDIX A. CLEANING UP MERCURY SPILLS

What NOT to Do

Never use an ordinary vacuum cleaner to clean up mercury. The vacuum cleaner will release mercury vapor into the air and increase exposure. The vacuum cleaner will also be contaminated and have to be thrown away.
Never use a broom to clean up mercury. It will break the mercury into smaller droplets and spread them.
Never pour mercury down a drain. It may cause plumbing problems and cause pollution of the septic tank or sewage treatment plant.
Never wash mercury-contaminated items in a washing machine. Mercury may contaminate the machine and/or pollute sewage.
Never walk around if your shoes might be contaminated with mercury. Contaminated clothing can also spread mercury around.

How to Clean Up a Broken Fluorescent Bulb

1. Have people and pets leave the room, and do not let them walk through the breakage area on their way out.
2. Open windows to vent vapors and leave the room for at least 15 minutes.
3. Shut off the central forced-air heating/air conditioning system to the affected area.
4. Put on rubber, nitrile, or latex gloves.
5. Use duct tape to pick up small pieces of glass and powder. Ensure all pieces of glass are picked up. When a CFL breaks, often the biggest hazard can be broken glass.
6. Wipe the area clean with a damp paper towel or wet wipe.
7. Place all materials in a sealed hard container.
8. If the spill occurs on carpet or a rug, disposing of the rug or area of contaminated carpet may be required. Mercury is not easily removed from carpets or rugs, so disposal is often the best solution to ensure the mercury is properly cleaned up.
9. Carefully scoop up glass pieces and powder using stiff paper or cardboard.
10. Wipe off all other hard surfaces (such as counters, floors, or shoes) that came into contact with the broken glass or mercury-containing powder. Soft material such as clothing can be washed as long as it did not come into direct contact with the broken materials. If it did, it can be disposed of in the same manner as the glass and powder materials.
11. Immediately place all cleanup materials outdoors in a trash container or protected area.
12. Wash your hands.
13. Check to see if your community has a household hazardous waste program. If not, check with your local landfill to see how to dispose of the material.
    The next several times you vacuum, shut off the central forced-air heating/air conditioning system and open a window before vacuuming. Keep the systems

off and the window open for at least 15 minutes after vacuuming. After vacuuming the area for the first time, remove the vacuum bag (or empty and wipe the canister), and put the bag or vacuum debris in a sealed plastic bag and dispose of in the same manner as the cleanup material.

How to Clean Up a Broken Mercury Thermometer

CFLs contain an average of 4 milligrams of mercury, about enough to cover the tip of a ballpoint pen. By comparison, older thermometers contain about 500 milligrams of mercury. Therefore, different precautions should be taken when cleaning up a spill from a thermometer or a larger source of mercury than from a CFL.

1. Have people and pets leave the room, and do not let anyone walk through the breakage area on their way out.
2. Open windows to vent vapors, shut all doors to other parts of the house, and leave the area for at least 15 minutes.
3. Shut off the central forced-air heating/air conditioning system to the affected area.
4. Put on rubber, nitrile, or latex gloves.
5. Place a paper towel in a hard container. Pick up any broken pieces of glass or sharp objects and transfer them to the paper towel in the container. Seal and label the container.
6. Locate visible mercury beads. Use a squeegee or cardboard to gather mercury beads in one location. Use slow sweeping motions to keep mercury from becoming uncontrollable. Take a flashlight, hold it at a low angle close to the floor in a darkened room, and look for additional glistening beads of mercury that may be sticking to the surface or in small cracked areas of the surface. Note: Mercury can move surprising distances on hard flat surfaces, so inspect the entire room when searching.
7. Dampen a paper towel and place it in a hard container. Use an eyedropper to collect or draw up the mercury beads and squeeze mercury onto the paper towel. Seal and label the container.
8. After you remove larger beads, put shaving cream on the bristles of a small paint brush and gently *dot* the affected area to pick up smaller hard-to-see beads. Alternatively, use duct tape to collect smaller hard-to-see beads. Place the paint brush or tape in a hard container. Seal and label the container.
9. Place all materials used with the cleanup, including gloves and sealed containers, in a trash bag. Secure trash bag and label it.
10. If the spill occurs on carpet or a rug, disposing of the rug or area of contaminated carpet may be required. Mercury is not easily removed from carpets or rugs, so disposal is often the best solution to ensuring the mercury is properly cleaned up.
11. If you choose not to clean up the spill yourself, you may want to request the services of a contractor. Call DEQ or your local health district to inquire

about contractors in your area and to verify what monitoring equipment should be used.

12. Remember to keep the area well ventilated to the outside for at least 24 hours after your successful cleanup. Continue to keep pets and children out of cleanup area. If sickness occurs, seek medical attention immediately. View information on health effects of exposure to vapors from mercury. For additional information on health effects, see the Agency for Toxic Substances and Disease Registry's Mercury Fact Sheet.

How to Clean Up a Larger Mercury Spill

1. Isolate the area. Have people and pets leave the room, and do not let anyone walk through the breakage area on their way out.
2. Shut off the central forced-air heating/air conditioning system, if you have one.
3. Open windows to vent vapors, shut all doors to other parts of the house, and leave the area.
4. Call 911 to activate Idaho's Emergency Response Network, which consists of state and local agencies (including designated DEQ regional office personnel), and, if necessary, federal agencies.
5. If the spill is greater than 1 pound (2 tablespoons), also call the National Response Center (NRC) at (800) 424-8802. Any time 1 pound or more of mercury is released to the environment, it is mandatory to call the NRC.

Disposal of Mercury-Containing Products

- Separate mercury-containing products from regular garbage. Products with mercury include electronic equipment with monitors (including televisions), fluorescent lighting, thermometers, thermostats, old paint (pre-1991), and batteries (pre-1995).
- Do not remove mercury switches from products such as thermostats; it is safer to store or recycle the product when it is intact.
- Take any mercury-containing products that you have collected to your local hazardous waste collection facility. Ensure that mercury thermometers are well protected from breakage. Call your local municipality for information on where to take mercury-containing waste.