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Chemicals in our Environment

The physical environment is a major factor in health and wellness. Where you live is as important as the food you eat and the air you breathe. The structures and the environments that are our homes, schools, work places, vehicles, and neighborhoods all impact our lives and affect our health.

Off-gassing:

Off-gassing or out-gassing is the release of chemicals from an object or substance. Many things off-gas—carpets, furniture, paint, wood, fabrics, plastics, new car interiors. The process of off-gassing is when something releases chemicals into the environment. It can take many forms. Off-gassing is a concern because a lot of the chemicals released during the off-gassing process are potentially harmful and toxic. Off-gassing can be especially harmful when it happens in an enclosed space. This is why we are instructed to open windows in certain situations or to use certain products only in well-ventilated areas. Inhaling these chemicals or absorbing them through the skin or mucus membranes can be very harmful. Things off-gas more in the heat.

Formaldehyde:

Formaldehyde is a chemical that can cause cancer in humans. Formaldehyde is everywhere, contained in many products that we use regularly. Formaldehyde is commonly used in building materials such as particle board, fiberboard, hardwood paneling, and in many common building and household products, for example, flooring, furniture, cabinets, drawers, wall coverings, drapes, glue. Even paper towels and tissue paper can contain formaldehyde.

Some things that produce formaldehyde: cigarette smoke, kerosene space heaters, gas stoves.

New car interiors—that new car smell—is the result of a mix of chemicals that includes formaldehyde, PCBEs, and phthalic acid esters (phthalates) that off-gas from the car's interior and exterior plastics, wood, leather, fabrics, seat cushions, glues, sealants, and more. Being exposed to these substances can make allergies and asthma symptoms worse, can cause nasal, throat, and eye irritations, headaches, coughs, skin eruptions, flu-like symptoms. Many are neurotoxins and can cause cancer. Formaldehyde is a VOC.

VOCs:

VOCs are volatile organic compounds that are carbon-based. They evaporate into the air, under the right conditions. VOCs are emitted as gasses from certain solids or liquids. These chemicals can have short- and long-term adverse health effects. According to the Environmental Protection Agency (EPA), there are thousands of products that emit VOCs including: paints, paint strippers, cleaning products, pesticides, building materials and furnishings, office equipment such as copiers and printers, correction fluids and copy paper that is carbonless, craft materials such as glues and adhesives, permanent markers, and photographic solutions.

Paints, varnishes, wax all contain organic solvents as do many cleaning, disinfectiong, cosmetics, and degreasing products. Fuels are made up of organic chemicals. All of these products can release organic compounds while you are using them and when they are stored.

Exposure to VOCs can cause eye, nose, throat irritation, loss of coordination, nausea, damage to the liver, kidneys, and central nervous system. Some organic compounds can cause cancer in animals. Some organic compounds are know to cause cancer in humans.

BPA:

BPA is a carbon-based synthetic compound – Bisphenol A. It is used to make certain plastics and epoxy resins. Its plastics are clear and tough and are made into many common consumer products such as water bottles, sports equipemnt, CDs and DVDs. Epoxy resins containing BPA are used to line water pipes, as coatings on the inside of many food and beverage cans, and in making thermal paper such as used in cash registers, adding machines, and ATMs/credit card terminals.

BPA has been shown to mimic thyroid and sex hormones in people and animals. It has been associated with a wide variety of health problems including altered brain and nervous system development and changes in the reproductive system. Some studies associate BPA exposure with a host of issues including behavioral changes in children and diseases like obesity and heart disease. The existing evidence suggests that the developing fetus and young child are most at risk. Children cannot metabolize and excrete BPA as quickly and as efficiently as adults. Detoxified BPA can be reactivated as it passes through the placenta to the fetus (see Environmental Working Group, October 17, 2008, "Tips to Avoid BPA Exposure"; Environmental Working Group, April 22, 2008, "EWG Supports California BPA Assessments.") In January 2010, the FDA announced that it had "some concern about the potential effects of BPA on the brain, behavior, and prostate gland in fetuses, infants, and young children." (see Environmental Working Group, June 3, 2015, "BPA in Canned Food: Regulation of BPA.")

Phthalates:

Phthalates are a group of chemicals used in plastics that make plastics flexible and durable. Plastics that contain phthalates are commonly used in building materials, clothing, cosmetics (such as nail polish, skin creams and lotions, deodorants, shampoos, conditioners, and hair sprays), perfumes, some insect repellents, food packaging, toys, and products made out of vinyl (e.g., shower curtains, flooring, rain coats), and in medical supplies such as blood transfusion bags and tubing, IV fluid bags and tubing, and other medical devices. Phthalates are also found in lubricating oils, solvents, detergents, and pencil erasers.

- In September of 2000, the EPA determined that diisononyl phthalate "can reasonably be anticipated to cause carcinogenicity [cancer] and liver, kidney, and developmental toxicity."

- In 2008, the EPA stated in their "Phthalates and Cumulative Rise Assessment" report that, "the United States and the European Union have passed legislation to restrict the concentrations of several phthalates in children's toys; the European Union has also banned some phthalates from cosmentics," that "the risks associated with phthalate exposure should be evaluated using a cumulative risk assessment," and "phthalates have been shown to cause a variety of effects in…animals; however, their adverse effects on the development of the reproductive system of male animals have led to particular concern."

- In 2009, the EPA announced an action to address chemicals of concern which include phthalates.

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Phthalates are everywhere—including children's items (toys, cups, bowls and dishes, spoons and feeding utensils) as well as in breast milk, cow's milk, and infant formula. Children mouthing and chewing toys that contain phthalates can result in phthalate exposure, as well as infant exposures while in neonatal intensive care units (NICU) through medical supplies and equipment containing phthalates. Phthalates are in your car, coating the chassis against rust and softening the plastics of its doors, dashboard, and the steering wheel that you hold onto.

People are exposed to phthalates by: eating and drinking foods that have been in contact with containers and products containing phthalates such as plastic packaging film and sheets, garden hoses, inflatable toys, blood-storage containers, medical tubing, and some children's toys. Phthalates can leach into foods that are heated in plastic containers. Phthalates have been detected in drinking water. People are exposed to phthalates through breathing in air that contains phthalate vapors or dust contaminated with phthalate particles. Young children may have a greater risk of being exposed to phthalate particles in dust than adults because of their hand-to-mouth behaviors.

Indoor air concentrations of phthalates can be increased from off-gassing of building materials such as new vinyl flooring or newly painted rooms. Phthalates have been measured in house dust.

Phthalates are often classified as endocrine disruptors because of their ability to interefere with the endocrine system in the body. Human exposures to phthalates have caused: reduced sperm motility in males; increased incidence of developmental abnormalities such as cleft palate and skeletal malformations; increased incidence of undescended testes; decreased testes weight; decreased anogenital distance. Some studies have shown that phthalates interfere with sexual development by interrupting the production of testosterone. In Europe, phthalates are classified as "toxic to reproduction."

PCBs:

PCBs belong to a broad family of man-made, organic chemicals known as chlorinated hydrocarbons. PCBs were domestically manufactured from 1929 until their manufacture was banned in 1979. PCBs were used as flame retardants in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments, dyes, and carbonless copy paper; and many other industrial applications.

Even though PCBs are no longer commercially produced in the U.S., they are present in products and materials produced before the 1979 ban. These products include: transformers, capacitors, other electrical equipment (voltage regulators, switches, electromagnets), oil used in motors and hydraulic systems, florescent light ballasts, cable insulation, thermal insulation and materials containing fiberglass, felt, foam, cork, adhesives and tapes, oil-based paint, caulking, plastics, carbonless copy paper, floor finish.

Prior to the 1979 ban, PCBs entered the environment during their manufacture and use in the U.S. Today, PCBs can still be released into the environment from poorly maintained hazardous waste sites; illegal or improper dumping of PCB wastes; leaks or releases from electrical transformers containing PCBs; disposal of PCB-containing consumer products into the municipal or other landfills not designed to handle hazardous waste. PCBs can also be released into the environment by the burning of some wastes in municipal and industrial incinerators.

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PCBs have been demonstrated to cause cancer as well as a variety of other adverse health effects on the immune system, reproductive system, nervous system, and endocrine system.

Once in the environment, PCBs do not readily break down and therefore may remain for long periods of time cycling between air, water, and soil. PCBs can be carried long distances and have been found in snow and sea water in areas far away from where they were released into the environment. PCBs are found all over the world, (see Environmental Protection Agency "Polychlorinated Biphenyls (PCBs)."")

PBDEs:

PBDEs are polybrominate diphenyl ethers. PBDEs are flame retardants and have been used in a wide array of products including building materials, electronics, plastics, motor vehicles, furnishings, polyurethane foams, and textiles. PBDEs have been shown to reduce fertility in humans at levels found in households. PBDEs have a high resistance to degradation processes. People are exposed to low levels of PBDEs through ingestion of food and by inhalation. PBDEs bio-accumulate in blood, breast milk, and fat tissues. People are also exposed to PBDEs in their homes because they are prevalent in common household items. Studies in Canada have found significant concentrations of PBDEs in foods such as salmon, ground beef, butter, and cheese. PBDEs have also been found at high levels in indoor dust, sewage sludge, and effluents from waste water treatment plants.

According to the U.S. EPA's Integrated Risk Exposure Information System, evidence indicates that PBDEs may possess liver toxicity, thyroid toxicity, and neuro-developmental toxicity, (see EPA's January 2014 "Technical Fact Sheet PBDEs and PBBs.")

- In August 2003, the state of California outlawed the sale of penta- and octaPBDEs and products containing them, effective January 1, 2008
- As of June 1, 2006, the state of California began prohibiting the manufacture, distribution, and processing of flame-retardant products containing pentaBDE and octaPBDE. According to the EPA, exposure may pose health risks
- In April 2007, the state of Washington passed a bill banning the use of PBDEs
- In May 2007, the state of Maine passed a bill phasing out the use of decaBDE
- The state of Maine's Department of Environmental Protection found that all PBDEs should be banned
- The European Union decided to ban the use of two classes of flame retardants, in particular PBDEs and PBBs in electric and electronic devices

Contact us for more information!