



POLLUTION PROBE
CLEAN AIR. CLEAN WATER.

PRIORITY TOXICS IN YOUR ENVIRONMENT:
A WHERE, WHY AND HOW GUIDE

LEAD

Where is it found?

Lead can be found in all parts of our environment – the air, the soil, the water, contaminated household dust and in a variety of products we use in and outside our homes [1]. The table below provides some examples of common sources of lead:

Pathway	Source Examples
<i>Drinking water</i>	<ul style="list-style-type: none">• Old plumbing (used lead based solder)• Aging water mains• Brass fixtures
<i>Air</i>	<ul style="list-style-type: none">• Lead dust from old paint• Industrial emissions (only an issue if you're near a smelter or refinery)
<i>Consumer Products</i>	<ul style="list-style-type: none">• Piping• Metal Sheets• Pigments (found in some paints, crayons etc.)• Ammunition• Lead solder• Some Jewellery

Why is it harmful?

Lead is a highly toxic metal that can affect almost every organ and system in the body. Lead is particularly harmful to young children - it can have very damaging effects on their developing brain and nervous system, negatively affecting IQ and attention span, and leading to learning difficulties and behaviour problems [2; 3]. Every year, lead exposure is linked to 600,000 new cases of children with intellectual disabilities globally [4].

How can it be avoided/disposed of properly?

Ontario regulates lead levels in consumer goods, which means you are unlikely to encounter lead in most common items (be careful to pick lead free art supplies and jewellery). If you have any products containing lead (lead-acid batteries, old paints), dispose of them through your local municipality's hazardous waste program [3]. If you believe that there is lead in your home plumbing, flushing the water system before drinking (running cold water for 10-20 seconds) can help to reduce your exposure risk. In most homes, daily activity (toilets, showers) is enough to keep the water from accumulating significant amounts of lead. Flushing your system is not really a good long-term solution, as it not only wastes water but it also does not remove the root cause. When possible, replacing your old plumbing is the best route to take.

MERCURY

Where is it found?

Although mercury occurs naturally in the environment, it is now mainly released from a variety of industrial and commercial processes, such as coal generation and smelting. In the home, mercury exposure is most likely to occur through consumption of large fish (primarily tuna) and consumer products such as thermostats, thermometers, fluorescent bulbs and dental amalgam fillings [5].

Why is it harmful?

Exposure to mercury – even small amounts – may cause serious health problems [6]. Effects range from rashes to birth defects, and even death in cases of severe poisoning [7]. Mercury can have very detrimental effects on the central nervous system. Exposure to mercury has also been linked to kidney and brain damage [8].

How can it be avoided/disposed of properly?

You can minimize the risk of mercury exposure by avoiding consumer goods that may contain higher levels of mercury and limiting the amount of large fish you consume each week. Products containing liquid mercury should not be thrown in the garbage - they can be disposed of at a hazardous waste depot in most municipalities [9]. You should take great care when transporting these products to the proper disposal site, as mercury spills can lead to exposure to dangerous levels. Broken fluorescent bulbs are best cleaned up by ventilating the space for 15 minutes, storing pieces in a heavy glass jar, thoroughly wiping the surface with wet wipes and leaving the room to air out for another few hours [10].

PERFLUORINATED COMPOUNDS (PFCs)

Where are they found?

Perfluorinated compounds (PFCs) are used in many common household items and applications. They are key compounds in non-stick cookware, stain guarding of furniture and rugs, some food packaging and waterproof clothes and mattresses [11]. PFCs can get into our bodies through contaminated food, water and air [12].

Why are they harmful?

Like PBDEs, PFCs take an extremely long time to break down in our bodies and in the environment. For this reason, they can accumulate to potentially toxic levels. PFCs are believed to be both endocrine disrupting and carcinogenic [11]. In animal studies, they have been shown to decrease immune function, impede healthy organ operation, and cause developmental problems in offspring [11]. The studies conducted on humans however have so far been inconclusive [11].

How can they be avoided/disposed of properly?

The best way to avoid PFCs is to reduce consumption of fish (as PFCs can bioaccumulate in aquatic wildlife) [12]. Some activated carbon and reverse osmosis filtration systems have shown to be effective at removing PFCs from drinking water [12]. You can minimize exposure to these compounds by avoiding the use of non-stick cookware, stain-guarded clothing and other products containing PFCs.

POLYBROMINATED DIPHENYL ETHERS (PBDEs)

Where are they found?

Polybrominated diphenyl ethers (PBDEs) are a class of flame-retardants that can be found in all kinds of consumer goods such as pillows, computer casings and keyboards, furniture padding and even in some paints and coatings [13]. They take a very long time to break down in the environment and therefore have the capacity to build up to potentially dangerous concentrations. People in Canada are most likely to be exposed to PBDEs through indoor air and household dust (most likely from the use of PBDE-containing products degrading with use and age) and contaminated food (especially human breast milk) [14].

Why are they harmful?

The health risks and dangers associated with PBDEs are not well understood. Certain PBDEs are believed to be potent endocrine disruptors (estrogen and thyroid mimics), neurotoxic and possible human carcinogens [13].

How can they be avoided/disposed of properly?

You can minimize your exposure by choosing PBDE-free products – you may need to do some research or ask manufacturers if they use PBDEs. Washing your hands, cleaning your home and removing dust from your living space is also a great help, as well as covering any foam upholstery pads to reduce the amount of PBDEs in indoor air [15].

POLYCHLORINATED BIPHENYLS (PCBs)

Where are they found?

Polychlorinated biphenyls (PCBs) were used in the construction of electrical and industrial equipment until the late 1970s [16]. Due to their environmental persistence, trace amounts can be detected nearly everywhere in our environment [17]. All people in Canada have PCBs in their bodies; we are exposed through the food we eat, and to a lesser extent through air and water. The most common concentrated source of PCBs for people in Canada is contaminated food; people who consume large amounts of fish and marine mammals (PCBs can concentrate in aquatic ecosystems) and other wildlife are at especially high risk of exposure [17; 18].

Why are they harmful?

Chronic exposure to low levels of PCBs may affect reproduction and the development of newborns and children [17]. PCBs are considered probable carcinogens and are capable of producing other extremely carcinogenic compounds if burned [19].

How can they be avoided/disposed of properly?

Indigenous communities, anglers, hunters and people eating large amounts of fish and wildlife are the most at risk to PCB exposure [17]. The best way to minimize the amount you ingest when eating wild fish is to remove the fat, intestines and skin as this is where PCBs will be most concentrated. To minimize exposure from consumer goods, most local waste management facilities and some private companies handle proper disposal of electrical equipment that contains PCBs. Older electronics can potentially contain PCBs, however anything made after 1979 is unlikely to contain them.

POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)

Where are they found?

Polycyclic Aromatic Hydrocarbons (PAHs) are primarily airborne contaminants that are introduced into the environment through the incomplete combustion of organic materials such as wood, coal, diesel and tobacco leaf [20]. In the home, the most common sources are heating fuel combustion (wood stoves and open fireplaces), contaminated air coming in from the outside (vehicle pollution), smoking and even cooking (food grown in contaminated soil, charred meats) [21]. Naphthalene (the simplest PAH) is a major component in moth balls and moth flakes which continue to be used in Canada to control moths and larvae that eat fabric [22].

Why are they harmful?

Certain PAHs are probable or possible carcinogens and mutagens, meaning they have cancer-causing potential and can cause changes in the genetic material (DNA) of cells that may lead to cancer. Some PAHs have teratogenic properties – they can cause a higher risk of birth defects if people are exposed to them [23]. Brief exposure to naphthalene vapours can also cause headaches, nausea, dizziness and vomiting and other health problems [24;25].

How can they be avoided?

PAHs are difficult to avoid because their sources are very common (cars, asphalt, tobacco smoke etc.) [23]. The best way to avoid them at home is to use cleaner burning cooking/heating methods (avoid charcoal briquettes, open fireplaces, burning food) and to stop smoking. Avoid using mothballs as they can expose you to higher concentrations of naphthalene.

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