



## EFFECTS OF LEAD ON HUMAN HEALTH

### The Issue

Lead occurs naturally in the environment and has many industrial uses. However, even small amounts of lead can be hazardous to human health.

### Background

Everyone is exposed to trace amounts of lead through air, soil, household dust, food, drinking water and various consumer products. The amount of lead in the environment increased during the industrial revolution, and again significantly in the 1920s with the introduction of leaded gasoline. However since the early 1970s, lead exposure in Canada has decreased substantially, mainly because leaded gasoline and lead based paint were phased-out and the use of lead solder in food cans was virtually eliminated.

### Health Risks of Lead Exposure

Short-term exposure to high levels of lead can cause vomiting, diarrhea, convulsions, coma or even death. Severe cases of lead poisoning are rare in Canada.

However, even small amounts of lead can be harmful, especially to infants, young children and pregnant women. Symptoms of long-term exposure to lower lead levels may be less noticeable but are still serious. Anaemia is common and damage to the nervous system may cause impaired mental function. Other symptoms are appetite loss, abdominal pain, constipation, fatigue, sleeplessness, irritability and headache. Continued excessive exposure, as in an industrial setting, can affect the kidneys.

Lead exposure is most serious for young children because they absorb lead more easily than adults and are more susceptible to its harmful effects. Even low level exposure may harm the intellectual development, behaviour, size and hearing of infants. During pregnancy, especially in the last trimester, lead can cross the placenta and affect the unborn child. Female workers exposed to high levels of lead have more miscarriages and stillbirths.

If you are concerned about lead exposure, your doctor can conduct a simple blood test to measure your blood lead level. Your doctor will recommend

corrective action if the amount is over 10 micrograms per decilitre.

### Sources of Lead Exposure

#### Food

Traces of lead are found in almost all food. Airborne lead falls onto crops or soil and is absorbed by plants. Lead solder used in making cans can also contaminate food, however, in Canada food manufacturers have eliminated the use of lead-soldered cans. Infants can also absorb lead from their mothers' bodies through breast milk.

#### Air

Lead is released into air through industrial emissions, smelters and refineries. With the introduction of unleaded gasoline in Canada in 1975, lead concentrations in the air have declined significantly, falling 76 per cent between 1973 and 1985. Leaded gasoline in cars was banned in Canada in 1990. Since then levels of lead in the air of most Canadian cities have dropped .

#### Dust and Soil

Dust and soil can be significant lead exposure sources, especially for young children. Lead in soil can come from the air or from erosion of lead-bearing rocks, and may be carried indoors as dust. Lead dust can also be generated within the home, especially older homes that used lead-based paints or lead solder. Lead dust is especially dangerous for babies and young children, because they tend to put things in their mouths and their breathing zone is closer to floor level.

#### Drinking Water

In most of Canada, the amount of lead in natural water supplies is very low. However, lead can enter the water supply from lead solder in plumbing, lead service connections or lead pipes in your home. Homes built before 1950 often have leaded distribution lines and service connections. In newer homes, lead may leach from solder for several years until the pipes form a protective oxide layer. Lead is more likely to be found in soft or very acidic water and in very old or very new homes. The National Plumbing Code of Canada does not permit the use of lead solder in new drinking water plumbing or repairs to drinking water supplies. Several provinces also limit the amount of lead solder in drinking water supply lines.



Lead levels in tap water increase as water stands in pipes. It's a good idea, especially with soft water, to run the cold water first thing in the morning or any other time the system hasn't been used for a number of hours. Use only cold tap water for drinking, cooking and making baby formula, since hot water is likely to contain more lead. Drinking fountains may have higher levels of lead than water from nearby taps, because the water usually sits for a longer time. They may also have more soldered joints.

#### Paint

Most indoor and outdoor paints produced before 1960 contained substantial amounts of lead. If you strip or sand old paint that contains lead, you could breathe in lead particles. Since 1976, the amount of lead in interior paint has been limited by law.

Although the lead content of exterior paint is not regulated, Canadian paint manufacturers have voluntarily ensured that no lead is intentionally added. Exterior paint with lead carries a warning label.

## Other Sources of Lead

- Inexpensive, horizontal PVC (plastic) mini-blinds made in Asia or Mexico may contain lead. Health Canada recommends that if you have children 6 years of age or under, you should remove these blinds from your home. They should also be removed from schools and child care centres as lead can cause neurological damage in young children.
- Workers in smelters, refineries and other industries may be exposed to high levels of lead. Lead dust may be breathed in and can also cling to skin, hair, clothing and vehicles, and be carried to the home, exposing workers' families. Most provincial governments require that lead-exposed workers be monitored for blood lead levels.
- Lead can enter food, especially acidic food such as fruit juice, from lead-based glazes on glassware and ceramics. Canadian regulations limit lead content in glazes on glassware and ceramics used in preparing, serving, or storing food. However, pottery or glassware from abroad may contain enough lead to be a hazard to your health.
- Leaded crystal is widely used for serving beverages. When the crystal comes in contact with beverages,

especially acidic beverages such as port, wine, fruit juices and soft drinks, some lead dissolves into the liquid. The amount of lead that dissolves depends on the lead content of the crystal, the type of beverage and the length of time they are in contact with each other. Do not serve pregnant women or children drinks in crystal glasses.

Lead fumes or particles can be released when waste oil, coloured newsprint, battery casings or lead-painted wood is burned. Candles that contain lead in their wicks may also release harmful levels of lead when burned. Using lead solder in a hobby, such as in making stained glass, lead shot or lead fishing weights, may expose you or your family to harmful lead vapours.

## Government of Canada's Role

The Government of Canada continues to work to reduce the risks of lead exposure to Canadians from all sources. Health Canada is monitoring the results of several large studies in the United States and Europe on the impact of lead on young children.

In Canada, drinking water quality is a responsibility shared among various levels of government. Health Canada works closely with the provinces and territories, through the Federal-Provincial-Territorial Committee on Drinking Water, to establish the Guidelines for Canadian Drinking Water Quality. Each jurisdiction is responsible for setting their own enforceable guidelines or regulations, based on the Canadian guidelines. The Guidelines limit the lead content of drinking water to a Maximum Acceptable Concentration of 0.010 milligrams per litre of water.

Health Canada is also developing a Lead Risk Reduction Strategy to control lead levels in consumer products that children may be exposed to. It proposes to regulate, under the Hazardous Products Act, the lead content of four categories of consumer products that children are likely to come into contact with, such as:

- Products intended to be or likely to be placed in or near the mouth (e.g., pacifiers, baby bottle nipples, crib toys, mouthpieces of musical instruments)

- Children's equipment, furniture, toys and other items intended for use by a child in learning or play (e.g., strollers, high chairs)
- Products intended for use in preparing, serving, or storing food or beverages (e.g., cutlery, tableware, cooking utensils)
- Consumer products intended to be or likely to be melted or burned in enclosed spaces (e.g., candles, fuel for indoor lanterns)

The strategy will serve as the foundation for new lead regulations under the Hazardous Products Act.

## Need More Info?

For additional information on lead see: Health Canada - Lead Information package [http://www.hc-sc.gc.ca/hecs-sesc/toxics\\_management/publications/leadQandA/lead.htm](http://www.hc-sc.gc.ca/hecs-sesc/toxics_management/publications/leadQandA/lead.htm)

Health Canada's warning about potential children's lead exposure at: [http://www.hc-sc.gc.ca/english/protection/warnings/2003/2003\\_82.htm](http://www.hc-sc.gc.ca/english/protection/warnings/2003/2003_82.htm)

Health Canada, 1998. Information bulletin - lead and cadmium <http://www.hc-sc.gc.ca/english/media/releases/1998/lead.htm>

The Canada Mortgage and Housing Corporation (CMHC) Building, Renovating and Maintaining at: <http://www.cmhc-schl.gc.ca/en/burema/index.cfm> or call: 1-800-668-2642

For more information on Lead see the following It's Your Health fact sheets: Leaded Paint at: <http://www.hc-sc.gc.ca/english/iyh/products/leadpaint.html>

Lead Crystal at: [http://www.hc-sc.gc.ca/english/iyh/products/crystal\\_lead.html](http://www.hc-sc.gc.ca/english/iyh/products/crystal_lead.html)

For additional articles go to the It's Your Health Web site at: [www.healthcanada.ca/iyh](http://www.healthcanada.ca/iyh) You can also call (613) 957-2991