Health Canada Santé Canada

Your health and safety… our priority. *Votre santé et votre sécurité… notre priorité.*

Lead and Human Health

Updated:

July 2011

IT'S YOUR HEALTH

Lead and Human Health

THE ISSUE

Lead occurs naturally in the environment and has many industrial uses. Everyone is exposed to low levels of lead through food, drinking water, air, household dust, soil, and some consumer products. However, ongoing exposure to even small amounts of lead may be harmful to your health.

The amount of lead in the environment increased during the industrial revolution, and again significantly in the 1920s with the introduction of leaded gasoline. Levels of lead in the Canadian environment and in Canadians have declined significantly over the past 30 years. According to data from the Canadian Health Measures Survey, blood lead levels in Canadians aged 6–79 years have declined over 70% since the 1970s.

HEALTH EFFECTS

Recent scientific studies on lead show that adverse health effects are occurring at lower levels of exposure to lead than previously thought. At low levels of exposure to lead, the main health effect observed the nervous system; specifically, exposure to lead may have subtle effects on the intellectual development of infants and children. Infants and toddlers are particularly vulnerable to the harmful effects of lead because they are undergoing a period of rapid development; furthermore, their growing bodies absorb lead more easily and excrete lead less efficiently than adults. In addition, infants and young children are more likely to ingest lead because of their natural habit of putting objects into their mouths.

Once in the body, lead circulates in the blood and either builds up in bone or is eliminated from the body, mostly in urine. Lead can stay in the body for over 30 years following exposure.

Health effects associated with exposure to **high** levels of lead include vomiting, diarrhea, convulsions, coma or even death. However, such severe cases of lead poisoning are rare in Canada.

SOURCES OF EXPOSURE TO LEAD

Before leaded gasoline was phased out in Canada, lead in the air was the predominant source of exposure for Canadians. Today, the primary source of exposure to lead for Canadians is from food and drinking water although several factors, such as whether your home has lead, copper or plastic service lines, can affect your exposure level. For infants and toddlers, ingestion of soil and dust containing lead, along with food and

Canada

drinking water, are the greatest sources of exposure to lead in the environment.

Food

While lead is not deliberately added to foods, low levels of lead have been detected in a variety of foods. Lead is introduced to foods through uptake from soil into plants and by airborne lead falling onto plant surfaces. Additionally, lead may be introduced to foods during transport to market, processing, and kitchen preparation including cooking with water contaminated with lead, or from the use of lead-containing utensils and storage of food in containers containing lead such as lead-glazed ceramic foodware or lead crystal ware. In Canada and most other countries, food manufacturers have eliminated the use of lead-soldered food cans, which has contributed to the nearly eight-fold decrease in dietary exposure to lead observed in Canadians since the 1980s.

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 old lead service connections (pipes) or lead solder in the plumbing in your home. Homes built before 1950 often have lead service connections since lead was commonly used to supply water to Canadian homes before then. Lead solder was used for plumbing until 1990 when the *National Plumbing Code of Canada* no longer allowed the use of lead solder in new drinking water plumbing or in repairs to existing drinking water systems. The amount of lead leached into drinking water will increase as water sits in pipes or if the water is very soft or very acidic. Many municipalities have instituted programs to replace lead service lines. To find out if your home's water is supplied by a lead service line, contact your municipality.

Dust and Soil

Dust and soil can be significant sources of exposure to lead for toddlers. Lead levels in soil tend to be higher in cities, near roadways, and around industrial sources that use or emit lead, near weapon firing ranges, or next to buildings where crumbling leaded paint has fallen into the soil. Lead-contaminated soil can be tracked into residences. Sources of lead in household dust can also come from within the home, especially older homes that contain lead-based paints.

Air

Lead is released into air through industrial emissions, smelters and refineries. With the introduction of unleaded gasoline in Canada in 1975 and the prohibition of leaded gasoline in the 1990s, lead concentrations in the air have declined significantly. Since then, lead levels in the air of most Canadian cities have dropped below detectable limits.

Paint

Lead-based paint in your home is a serious health hazard if it is chipping or flaking, or if it is within the reach of children who might chew on it. In these cases, you should remove the paint following very specific guidelines.

In 1976, the amount of lead that could be intentionally added to interior paints was limited by federal law, but exterior paints could still contain higher amounts of lead, provided they carried a warning label. Under the *Surface Coating Materials Regulations*, which came into effect in 2005 and were amended in October 2010, the lead limit was further reduced and extended to include all consumer paints and coatings. Paint manufacturers can no longer intentionally add lead to their paint. Canadian manufacturers of interior and exterior consumer paints and coatings have been voluntarily keeping to this limit since 1991.

Some specialty coatings, such as artists' paints and metal touch-up coatings can contain higher levels of lead, but if they do, they must be labelled to warn against applying the paint to surfaces that children and pregnant women might come in contact with. Most indoor and outdoor paints made before 1950 contained substantial amounts of lead.

Other Sources of Lead

Other potential sources of exposure to lead include:

- products containing lead such as costume jewellery, art supplies, candles, leaded crystal and glazes on ceramics and pottery
- working on a hobby that involves the use of lead or lead solder, such as making stained glass, lead shot or lead fishing weights
- living in or frequently visiting older buildings that contain deteriorating lead paint or that are undergoing renovation activities
- behaviours such as smoking or soil ingestion

Workers in smelters, refineries and other industries may be exposed to high levels of lead. Lead dust may be breathed in. It can also cling to skin, hair, clothing and vehicles and be carried to the home,

Lead and Human Health

Updated:

July 2011

IT'S YOUR HEALTH

exposing workers' families. Most provincial governments require that workers exposed to lead be monitored for blood lead levels.

REDUCE YOUR RISK

You can take some steps to reduce your and your family's exposure to lead by following the recommendations below:

- Run the cold water tap first thing in the morning or any other time the water hasn't been used for a number of hours. This is especially true if you have soft water. Use only cold tap water for drinking, cooking and making baby formula, since hot water is likely to contain more lead.

- If you have an older home and suspect that it might contain lead-based paint, do not use sanders, heat guns or blowlamps to remove it. They create dust and fumes that contain lead. Use a chemical paint stripper, preferably one with a paste that can be applied with a brush. Chemical strippers contain potentially harmful substances themselves, so always read the warning labels and manufacturer's instructions carefully before each use. Keep children and pregnant women away from the work area and always wear goggles, gloves and a good quality breathing mask.
- Clean your house regularly to remove dust and particles that may contain lead. This is especially important for surfaces that young children might frequently touch.
- Do not keep food or beverages in lead crystal containers for any length of time. Do not serve pregnant women or children drinks in crystal glasses. Babies should never drink from lead crystal.
- If you own glazed glass or ceramic dishes bought outside of Canada, do not use them for serving food or beverages, as they may contain higher levels of lead than are allowed in Canada.
- If you have children six years of age or under, you should remove any horizontal PVC (plastic) mini-blinds made in Asia or Mexico from your home.
- If you work in a smelter, refinery or any other industry where you are exposed to high levels of lead, shower and change your clothing before going home, to minimize the amount of lead your family is exposed to. Make sure you have your blood lead level checked regularly.
- Never burn waste oil, coloured newsprint, battery casings or wood covered with lead paint in or near your home, as lead fumes may be released. Dispose of them through your municipality's Hazardous Waste program.
- If you use lead solder in a hobby, such as stained glass-making, use a good quality

Canada

breathing mask, keep surfaces clean and keep children and pregnant women out of the area. Wash hands after handling lead solder.

- Avoid eating wild animals that have been shot with lead bullets. Use non-lead bullets and shots when hunting for food.

If you are concerned about exposure to lead, speak to your doctor. Your doctor will recommend corrective action if your blood lead level is over the established intervention level which is expressed in micrograms per decilitre.

GOVERNMENT OF CANADA'S ROLE

The Government of Canada has been working to reduce exposure to lead and minimize health risks to Canadians for many years. The significant decline of lead in the Canadian environment and in Canadians since the 1970s is primarily due to the successful phase-out of lead in gasoline, paints and solder used in food cans, in addition to other government regulation and industry action over this time period.

The federal government has put in place numerous regulations and guidelines directed toward the reduction of lead in consumer products, cosmetics, drinking water, food, natural health products, pharmaceutical products, tobacco, industrial releases, and other sources such as soil and air. These include:

- Federal-Provincial-Territorial Committee on Drinking Water established lead content limits in the Guidelines for Canadian Drinking Water Quality
- Health Canada's Food Directorate and the Canadian Food Inspection Agency developed maximum limits for lead in various foods as specified in the Canada Food and Drug Regulations.
- Health Canada set out new proposed lead limits for four categories of consumer products that children are most likely to be exposed to in the Lead Risk Reduction Strategy for Consumer Products.

These and other actions have brought positive results. The results of the Canada-wide Canadian Health Measures Survey conducted from 2007 to 2009, shows a decline of over 70% in blood lead levels in the Canadian population since the 1970s. It is expected that levels of exposure to lead in Canada will continue to decline.

The Government of Canada also provides active support for international efforts focused on reducing exposure to lead on a global basis, including:

- The Great Lakes Water Quality Agreement
- The Arctic Monitoring and Assessment Program
- The United Nations Environment Programme (UNEP)
- The Organization for Economic Cooperation and Development (OECD)

The Government's work to control exposure to lead in Canada continues. Health Canada is focusing its efforts and resources on reducing exposure to lead in ways that can make the most difference for Canadians' health over the long term. This includes plans to reduce lead in food, consumer products, natural health products, and house dust, as outlined in the federal Risk Management Strategy for Lead. The federal government is also strengthening controls on releases of lead from various industrial sectors, revising blood lead guidelines for health care providers and public health officials, in collaboration with the provinces and territories, and updating the Soil Quality Guideline for Lead.

FOR MORE INFORMATION

- Health Canada's Lead web section at: www.hc-sc.gc.ca/ewh-semt/contaminants/lead-plomb/index-eng.php
- *It's Your Health* – Lead-Based Paint at: www.hc-sc.gc.ca/hl-vs/iyh-vsv/prod/paint-peinture-eng.php
- *It's Your Health* – Lead Crystalware and Your Health at: www.hc-sc.gc.ca/hl-vs/iyh-vsv/prod/crystal-cristal-eng.php
- *It's Your Health* – Safe Use of Arts and Crafts Materials at: www.hc-sc.gc.ca/hl-vs/iyh-vsv/prod/arts-eng.php
- Health Canada article, Minimizing Exposure to Lead from Drinking Water Distribution Systems at: www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/lead-plomb-eng.php
- Lead in Your Home by The Canadian Mortgage and Housing Corporation (CMHC) and Health Canada at: www03.cmhc-schl.gc.ca/catalog/productDetail.cfm?csid=1&cat=4&itm=23&lang=en&fr=1267063981515
- Health Canada's Total Diet Study at: www.hc-sc.gc.ca/fn-an/surveill/total-diet/index-eng.php

RELATED RESOURCES

For safety information about food, health and consumer products, visit the *Healthy Canadians* Web site at: www.healthycanadians.gc.ca

For more articles on health and safety issues go to the *It's Your Health* web section at: www.health.gc.ca/iyh

You can also call toll free at
1-866-225-0709 or
TTY at 1-800-267-1245

Updated: July 2011
Original: November 2002

Catalogue # H13-7/101-1-2011E-PDF
ISBN # 978-1-100-19170-6