



Home Environments

HOME ENVIRONMENTS

10.1 Indoor Air Quality

Indoor air pollution is an important health concern since many Canadians spend much more time indoors than outdoors. Indoor air contains some of the same pollutants found in outdoor air, although generally at lower levels (e.g., ground-level ozone is found at lower levels indoors). In addition, indoor air also contains concentrations of pollutants such as tobacco smoke, formaldehyde and vapours from household products that are much more diluted in outdoor air.

Indoor air in a home or building is a mix of many substances continually being exchanged with the air outdoors. Other than oxygen, nitrogen and carbon dioxide, indoor air contains contaminants such as vapours from consumer products, particles, and various biologicals such as bacteria, fungi, moulds, viruses and mite by-products. These contaminants can be harmful if their concentrations in air become too high.

Canadians have a growing interest in weatherizing homes and buildings to conserve energy and save on heating costs. Ventilation systems in many homes and buildings are not designed to serve these new “tight” buildings. The exchange between inside and outside air may be hindered, and may lead to an increase in indoor air pollutant levels.

Contaminants in Indoor Air

Most of the contaminants in indoor air, such as tobacco smoke, combustion gases and solvent vapours, are released or formed (by human activity or presence) in the home.

In general, ensuring proper ventilation, (including consideration of direction and velocity of supplied air), ensuring proper installation and maintenance of all heating systems and appliances, reducing emissions from consumer products and elimination of tobacco smoke is often a good start in improving indoor air quality. In some cases, pollutants (i.e., sulphur dioxide, benzene), may be entering the home from the outdoor air and in these cases, improving ventilation will not eliminate the problem.

The sources of exposure, health impacts and measures to reduce exposure of common pollutants of concern in the home are described in the following sections.

Aldehydes

Sources of aldehydes include urea formaldehyde foam insulation (now banned in Canada), plywood, particle board, glues, binders, paint preservatives, tobacco smoke, wood smoke, un-vented gas heaters, cosmetics and some permanent press fabrics. These can release pungent, irritating vapours, although emissions generally decrease with time. Some people are exceptionally sensitive to formaldehyde. Formaldehyde is an upper respiratory irritant that irritates the mucous membranes of the eyes, nose and throat and is a recognized allergen.

CANADIANS SPEND, ON AVERAGE, 90 PERCENT OF THEIR TIME INDOORS, USUALLY IN THE HOME.

Repeated exposure may cause hypersensitivity reactions, such as asthma and laryngeal edema. There is some evidence that at high levels (higher than are likely in homes), exposure to formaldehyde may cause cancer.

Exposure reduction: Ventilation should be increased and the amount of new textiles and new furniture containing wood composites introduced into an area could be off-gassed in an unoccupied area for several days or restricted. Tobacco smoke should be eliminated from the home or building.

Asbestos

For information on asbestos, see *Contaminant Profiles*.

Biological Agents

These include a vast range of agents such as viruses, bacteria, moulds, mildews, pollen grains, cell debris (such as pet dander) and dust mites. They are the major components of house dust. The normal level of biological agents in indoor air usually causes few health problems, but they can result in illness if levels are too high. Large amounts of pollen or fungal spores in the air can cause allergic reactions and aggravate asthma. Micro-organisms can be carried on dust particles or droplets of water. Moulds and fungi can grow in parts of the home that are constantly damp.

Moulds in the home can cause many health problems, from allergic reactions, acute infections, to chronic illness. Moulds produce particles (spores and residual matter) and gases (mouldy or musty odours). High moisture levels in the home will encourage the growth of moulds. If it is allowed to become stagnant, water in the tanks of humidifiers can be a source of disease-causing bacteria and moulds. (For more information on mould, see *Contaminant Profiles*.)

Building Materials

Indoor air can contain gases (e.g., formaldehyde, toluene, xylenes, VOCs) released by new building materials and by new furnishings.

Exposure reduction: Exposure to chemicals can be reduced by airing out a new home for the first several months. Ventilation should be increased in rooms with new furniture, carpeting etc.

Carbon Dioxide (CO₂)

Carbon dioxide is a colourless, odourless gas formed during combustion (e.g., in gas furnaces, stoves, kerosene heaters) and when people and animals breathe. Carbon dioxide may build up in poorly ventilated homes. Carbon dioxide can also be a significant problem in schools and offices if there are large numbers of people and inadequate fresh-air intake in the building. High CO₂ concentrations can cause headaches and drowsiness.

Exposure reduction: Chimneys, furnaces, and other fuel-fired appliances should be regularly cleaned, adjusted and properly maintained to keep toxic gases from building up in the home. Make sure there is adequate ventilation for

all devices that use air in their operation — such as fireplaces, furnaces, wood-burning stoves, exhaust fans and clothes dryers. Attention should be paid to air exchange, for example, in overcrowding situations ensure adequate air intake into the building.

Carbon Monoxide (CO)

For an overview of CO, see *Contaminant Profiles*.

Combustion By-Products

Gas stoves, wood stoves, fireplaces, unvented heaters, water heaters and tobacco products can produce CO, CO₂, SO₂, formaldehyde, hydrocarbons, nitrogen oxides (NO_x), particulates, and polycyclic aromatic hydrocarbons. For more information on CO, SO₂, NO_x, particulates, and polycyclic aromatic hydrocarbons see *Contaminant Profiles*, which also contains information on CO₂, formaldehyde.

Q. Are kerosene heaters safe?

- A. Gases emitted by unvented kerosene heaters are a definite health risk when fuel fumes and combustion gasses are allowed to build up in living spaces. Carbon monoxide, for example, may be harmful to individuals who have cardiovascular or chronic obstructive lung diseases, as well as for pregnant women, the newborn and the elderly. Symptoms of carbon monoxide poisoning include headache, dizziness and nausea. Nitrogen dioxide and sulphur dioxide both have harmful effects, particularly on children, who may suffer more frequent bouts of respiratory illness when exposed to increased amounts of these gases. Lung function may also be impaired. (For more information on CO, SO₂, NO_x see *Contaminant Profiles*.)

The following guidelines should be followed during operation of kerosene heaters:

- Use only for temporary heating. Turn off when people are sleeping or when the room is left empty for some time.
- NEVER leave children alone in a room with a kerosene heater.
- Follow manufacturers instructions carefully. Pay particular attention to specifications for fresh air ventilation, flame size and recommended clearances for combustible materials. Ventilation is particularly important in homes where people have heart problems or respiratory diseases such as asthma or emphysema.
- Do not touch the surface of the heater as it can become extremely hot. Keep out of reach of children.
- Use only low sulphur fuel (type number 1-K kerosene) in order to minimize sulphur dioxide emissions.
- NEVER use naphtha or gasoline in a kerosene heater as explosion and fire may result.

- Refuel the heater OUTDOORS and only when cool to the touch. Kerosene expands when it warms up, so the tank should never be filled to greater than 90 percent of its capacity.
- Store kerosene in a well-ventilated area, away from sources of heat, flame or sparks.

Do not use or store barbecues or barbecue fuel containers in the living quarters or in garages attached to homes. The fuel containers may leak and should be stored outdoors. Fumes from barbecuing may have health effects similar to those of kerosene heaters.

Consumer Products

These may include volatile organic solvents, pesticides, hair sprays, disinfectants and other products. Examples of consumer products containing solvents are cleaning fluids, cleansers, paint, art supplies, aerosol propellants and pest control products. Short exposures to solvent vapours can cause temporary dizziness. Prolonged or repeated exposures can irritate the eyes, lungs and skin, and damage the nervous system, liver and kidneys depending on the level and duration of exposure. Pest control products contain a variety of substances that may be poisonous at high doses. It should be noted that some substances can remain in indoor air for a long time, even after usage has stopped.

Exposure reduction: The use of paint strippers and other strong chemicals should be avoided in the home, as it is difficult to ventilate adequately. Such work should be done outside if possible. Product directions should always be followed [see Box on Paint Strippers, page 166] . Safety precautions must be followed when removing lead-based paint in the home (see “Removing Lead-based Paint” page 164 and in *Contaminant Profiles*.) Substitute non-toxic alternatives for cleaning and personal care products.

Art supplies should be used only under very well ventilated conditions. Resources are available on the topic of art and safety. (See Health Canada, Environmental Health Directorate in the Resource Guide.)

Acetone

Acetone is found in products such as household chemicals, nail polish, and paint.

Breathing moderate to high levels of acetone for short periods of time can cause nose, throat, lung, and eye irritation; headaches; light-headedness, confusion; increased pulse rate; nausea; vomiting; unconsciousness and possibly coma; and shortening of the menstrual cycle in women. Swallowing very high levels of acetone can result in unconsciousness and damage to the skin in the mouth. Skin contact can result in irritation and damage to the skin.

Warning signs of exposure to moderate levels of acetone are the smell and respiratory irritation and burning eyes. If these symptoms occur, the individual should remove herself/himself from the source of exposure.

Consumer products containing acetone should only be used in well ventilated areas, preferably outdoors and care should be taken in handling these products.

(See *Contaminant Profiles*.)

Environmental Tobacco Smoke (ETS)

Environmental tobacco smoke (ETS) consists of more than 4000 compounds, over 50 of which are known to cause cancer. ETS includes sidestream smoke, the smoke emitted from the burning cigarette, cigar, or pipe between puffs; and mainstream smoke exhaled by the smoker. Undiluted sidestream smoke, because it burns at a lower temperature, contains higher concentrations of many of the toxic chemicals in tobacco smoke, including nicotine, carbon monoxide, benzene, ammonia, 4-aminobiphenyl, and benzo[a]pyrene. Sidestream smoke particles are also smaller than those of mainstream smoke and thus can be inhaled more deeply into the lungs.



In 1992, the U.S. Environmental Protection Agency classified environmental tobacco smoke as a “Group A” carcinogen, producing cancer in humans. Canadian research has concluded that ETS causes more than 300 lung cancer deaths in non-smokers each year. ETS has also been declared a major preventable cause of cardiovascular disease and death by several authorities, including the American Heart Association.

Numerous studies indicate that children are at greater risk than adults from exposure to ETS. They have smaller airways and they breathe more rapidly (which means they inhale more air and more pollutants relative to their total body weight). The exposure of Canadian children is likely higher than for children in many other countries because Canadian children spend more time indoors. Lower indoor ventilation rates in colder climates result in higher rates of ETS contaminants in indoor environments.

The following are examples of some of the health effects associated with the exposure of children to ETS from parental smoking:

- More than 20 percent of all deaths from sudden infant death syndrome (SIDS) in Canada are associated with maternal tobacco use. Children in the United States are three times more likely to die from SIDS caused by maternal smoking than die from homicide or child abuse.
- Exposure to ETS substantially increases the risk of lower respiratory tract infections, and is responsible for an estimated 350 000 cases of bronchitis and 152 000 cases of pneumonia annually in the United States or 16 percent of all lung infections in children under the age of five.
- Children exposed to household smoking are at greater risk of requiring surgery for recurrent ear infections or tonsillitis.
- ETS exposure is associated with higher risk of developing asthma and more frequent and severe asthma attacks in children who already have the disease. In the United States an estimated 11 percent of all asthma cases and more than half a million physician visits for asthma each year are due to smoking in the home.
- ETS exposure in childhood may also be associated with an increased risk of developing chronic obstructive airway disease and cancer as adults.

Forty percent of Canadian households with children under the age of 15 have one or more smokers in the home. Another 41 percent of households do not include a smoker but permit visitors to smoke. This means that only 19 percent of homes are completely smoke-free. It is very difficult to quantify the exposure of non-smokers to ETS as it is extensively diluted by the surrounding air. The size of the room, ventilation system, number and brand of cigarettes smoked, number of people in the room, and humidity, all have an impact on the level of ETS. Smoking in confined spaces, such as in a small enclosed room or a car, can greatly increase concentrations of ETS.

Studies have attempted to measure exposure to various ETS compounds. Nicotine levels in homes have been found to range from 2 to 11 micrograms per cubic metre. One study estimated average concentrations of nicotine in the home to be 5.8 micrograms per cubic metre, with peak values being 10 times these average values. To put this in context, the level of exposure beyond which environmental carcinogens have been strictly regulated by U.S. federal agencies occurs at an exposure of 2.3 micrograms of nicotine per cubic metre of daily exposure over a working lifetime. Thus ETS exposure in the home is typically well above an acceptable level of risk.

It should also be noted that many ETS pollutants are absorbed onto surfaces and then later released, exposing non-smokers to carcinogens, toxins, and odours long after smoking has ceased.

Exposure reduction: Numerous surveys demonstrate that the public does not understand the nature of the specific risks from ETS exposure and the magnitude of those risks. There is support for an increased role for health professionals in communicating messages about the effects of ETS on children's health. The public also needs to be better informed about ways of reducing the exposure of others to tobacco smoke, since the preferred methods of decreasing exposure — smoking in a separate room or opening a window — are clearly inadequate forms of protection.

In addition to educational messages and legislation, health programs that promote smoke-free families as the norm have the potential to support those who have difficulty enforcing their own preferences at home. Making a home smoke-free is the least costly and the only effective means of substantially eliminating ETS.

As with other tobacco control initiatives, a comprehensive approach, one that includes a strong health promotion component along with regulatory reform based on sound scientific research, promises to be the most effective in changing societal attitudes and practices related to the involuntary exposure of others to the toxic pollutants found in tobacco smoke.

(Adapted from: National Clearing House on Tobacco and Health, Publications: *Environmental Tobacco Smoke (ETS) Series*, 1996.)

(Information on some contaminants found in tobacco smoke such as carbon monoxide (CO), nitrogen oxides (NO_x), particulates, and PAHs can be found in the *Contaminant Profiles*.)

Mercury

For an overview of mercury see *Contaminant Profiles*.

Nitrogen Dioxide (NO₂)

For an overview of NO₂, see *Contaminant Profiles*.

Particulate Matter in Indoor Air

Particulate matter is a variety of minute solid or liquid particles suspended in the air that can be inhaled into the respiratory system. The terms particulate matter, particulates, particles and aerosols are often used interchangeably. However, aerosols are very fine droplets of liquid that may contain dissolved chemicals. Particulate matter can be found in both indoor and outdoor air.

Indoor levels of air particles can be higher than the outdoor levels. The principal sources of particulate matter in indoor air are:

- cooking, especially when using wood, coal, oil or gas as fuel;
- cleaning activities such as vacuuming and dusting;
- heating, ventilation and air conditioning systems;
- use of consumer products such as spray disinfectants, cleaners and repellents;
- unvented clothes dryers;
- tobacco smoke; and
- particles carried into the dwelling from outdoor air.

People living near air pollution sources such as heavily travelled roadways, incinerators, petroleum refineries, metal foundries and other industrial plants, farms, quarries, large construction sites or surface mines are often exposed to relatively high levels of dust and other particulate matter.

The elderly, those with chronic pulmonary or cardiovascular disease and the very young, have been identified as being particularly susceptible to the effects of particles. Asthmatics, and individuals with respiratory infections or bronchitis may also be at particular risk when particulate levels are high.

Exposure reduction: Ensure that filters on furnaces and air conditioning systems are properly installed, cleaned and/or replaced regularly. Combustion appliances should be properly vented to the outdoors. Avoid the use of aerosol products indoors. Ensure proper ventilation of clothes dryers. Ultrasonic humidifiers can cause high levels of particles in indoor air which in turn can affect lung function. Use distilled or de-ionized water in ultrasonic humidifiers to minimize particle formation. Eliminate tobacco smoke in the building.

(For a more complete overview of particulate matter and more information on particle size, see Chapter 7. "Outdoor Air Quality and Human Health" and *Contaminant Profiles*.)

Radon

For an overview of radon, see *Contaminant Profiles*.

Water Vapour (Humidity)

Sources of humidity are washing, bathing and cooking, unvented clothes dryers and breathing by people and animals. Outdoor air that is either hot and moist or cold and dry will have a large effect on indoor humidity. Humidity can affect comfort and health. Low humidity can aggravate the symptoms of asthma and high humidity at high temperatures can sometimes lead to heat exhaustion or heat stroke. In winter, moisture can condense on and in the walls of homes that lack an effective vapour barrier. If ventilation is poor, the moisture may persist after the season changes, allowing moulds and fungi to grow within the building. This can cause allergies and other serious respiratory illnesses.

Exposure reduction: Control humidity with proper ventilation and dehumidifiers. Prevent condensation of water in windows and walls. Try to get by without using home humidifiers. Often normal activities such as washing and bathing provide comfortable levels of humidity. During the heating season, the relative humidity should be kept between 30 and 55 percent, and never more than 70 percent. Maintain household cleanliness to reduce moulds and fungi. (See Biological Agents above and Moulds in *Contaminant Profiles*.)

Guidelines on Indoor Air Quality

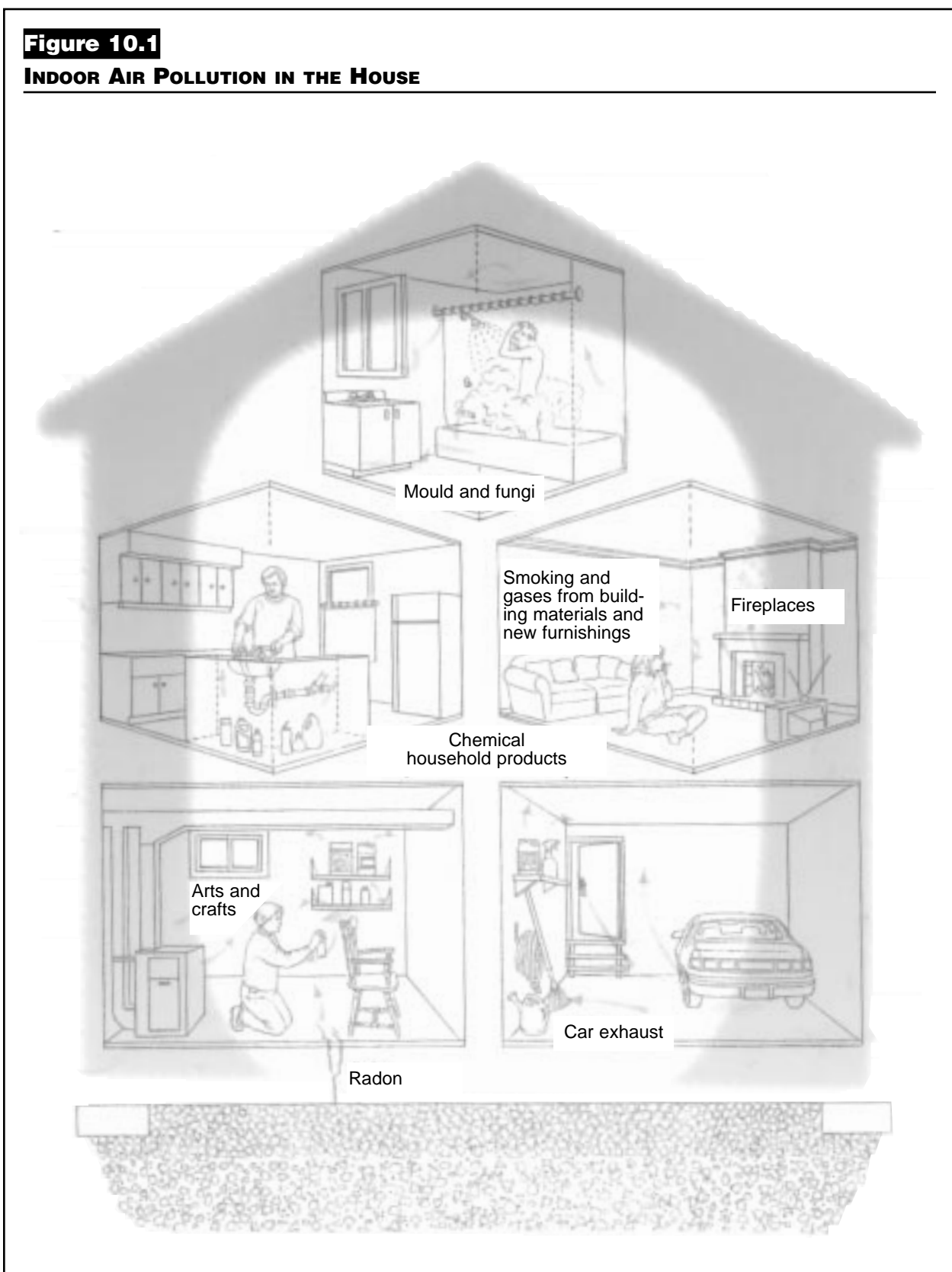
The Federal-Provincial Working Group on Indoor Air Quality (IAQ) has prepared guidelines concerning indoor air quality, which are available in the publication *Exposure Guidelines for Residential Indoor Air Quality*. For some pollutants, the guidelines suggest maximum acceptable concentrations, while for others there are recommendations on controlling exposure. In a few cases, professional help may be necessary to determine pollutant sources or levels; the guidelines also indicate when problems might occur.

The guidelines take into account sensitive groups in the population, however, the differences between individuals in a population can be great. Thus, the guidelines are carefully considered opinions of the concentrations that would be unlikely to cause adverse health effects in the average person, even if exposed for a lifetime.

The Federal-Provincial Advisory Committee on Environmental and Occupational health has produced two excellent publications on IAQ in office buildings — *Indoor Air Quality in Office Buildings: A Technical Guide* and *Office Air: A Worker's Guide to Air Quality in Offices, Schools and Hospitals*. For more information on indoor air quality, refer to Health Canada's pamphlet *Indoor Air Quality and You*.

Figure 10.1

INDOOR AIR POLLUTION IN THE HOUSE



10.2 HOME RENOVATIONS

Removing Lead-Based Paint

Older homes may contain lead-based paint. Removing or disturbing old lead-based paint as part of a renovation project can expose people in your home to a health risk. Even small amounts of lead can be harmful, especially to infants and young children. In addition, lead taken in by the mother can interfere with the health of the unborn child.

Children are particularly at risk because they absorb lead more easily than adults do. They are developing rapidly, and are more susceptible to the health hazards of lead. Children also absorb a higher proportion of lead from other sources (food, water and dust, for example) than adults. Contaminated dust is a particularly important source of exposure for babies and small children because they can ingest a significant amount of dust through their natural habit of putting things in their mouths.

The degree of lead poisoning varies depending on the amount of lead we are exposed to, and for how long. Studies show that prolonged exposure of children to even very small amounts of lead is serious. Depending on the level of exposure, lead can cause anemia, impair the functions of the brain and nervous system, and can result in learning disabilities and an inability to concentrate.

If your home was built before 1960, it was likely painted with a lead-based paint. Most paints made before 1950 contained large amounts of lead. In fact, some paint made in the 1940s contained up to 50 percent lead by dry weight. Lead was used to make paint dry quickly and wear well, and to make the colours vibrant. You can find out the level of lead in your paint by scientific testing. Some large Canadian cities have contractors using X-ray fluorescence (XRF) equipment to sense for lead on surfaces. If so, this would be your most economical means of testing for an extensive renovation.

Otherwise, have the paint analysed at a laboratory certified by the Standards Council of Canada or the Canadian Association for Environmental Analytical Laboratories for the analysis of lead in paint. This involves removing all paint and even some plaster from at least a 2 cm by 2 cm section of the wall to be tested. This sample is then sent to the laboratory for analysis.

Exposure reduction: Lead-based paint doesn't present a health hazard as long as the paint is not chipping or flaking, and isn't where it can be chewed by young children, for example, on window sills, older painted cribs and toys, etc. In fact, removing old paint can sometimes result in a more immediate hazard than simply leaving the painted area intact. To lessen any chance of exposure to leaded-paint, surfaces that are still in good condition can be covered with vinyl wallpaper, wallboard or panelling. In areas that children can't reach, applying one or more coats of non- leaded paint to old but intact surfaces will help.

Sanding sends a cloud of paint dust and scatters paint chips through the entire house. Dust from lead-based paint can contaminate the air you breathe, everything you touch, and any food that is exposed. Paint chips might be eaten by young children. Heat guns and blowlamps vaporize the paint, and can fill the air with leaded fumes. These fumes, and paint dust, can migrate out-of-doors,

spreading the lead to soils and gardens, and contributing to the build up of lead throughout the environment.

The safest way to remove lead-based paint on doors or trim is to have the wood stripped off-site, either professionally or outside in a well ventilated space. For walls, ceilings, or immovable trim, chemical strippers are perhaps the best solution. Application strippers, which consist of a paste applied with a brush, are best. However, all chemical paint strippers contain potentially harmful substances, so care must be taken when using them, (see Box "Safe use of paint strippers" page 166).

Some very important rules to follow:

- Pre-school children and pregnant women are especially susceptible to leaded dust. They should limit their exposure as much as possible.
- Remove as much of the furnishings from the work area as possible. Furniture and carpets that can't be removed should be covered completely with plastic sheeting. Isolate the work area to prevent the spread of scrapings, chips and particles of paint to other parts of the house. This can be done by covering doorways and vents with plastic sheeting and tape.
- If using paint strippers, follow all product safety recommendations regarding ventilation, skin and eye protection, use of masks etc. (See box on page 166).
- It's a good idea to keep a pair of coveralls and work shoes to wear only in the work area. Wash all work clothes separately from other clothing.
- Never eat, drink or smoke while removing paint.
- Clean the work area thoroughly at the end of each day. Collect paint scrapings and chips and place them in a sealed container clearly marked "Lead-containing paint scrapings: Hazardous Waste." Wipe the entire work area with a clean damp cloth, and discard the cloth when you're done. In many parts of Canada, special arrangements exist for the disposal of hazardous household wastes. Paint scrapings should not be discarded with the garbage. To find out how to dispose of old paint scrapings, contact either your local municipality, or the local office of the provincial Ministry of the Environment.
- As mentioned previously, another option is to have professionals do the job either in your home, or remove the woodwork for stripping at their shop. If you hire professionals to remove the paint in your home, make sure they follow the advice given here; the method of stripping, proper ventilation, clean up, etc.

Safe use of paint strippers containing methylene chloride

Strippers that contain methylene chloride, also known as dichloromethane, are fast-acting, versatile and easy to use. Methylene chloride, in fact, is the major component of nearly all paint removers on the market. Compared with sanding, which produces a lot of airborne dust, methylene chloride-based paint strippers are among the least hazardous methods available for removing lead-based paint. It is important, however, that safety precautions are taken and the manufacturer's instructions followed.

Methylene chloride is clear, colourless and has a mildly sweet odour. Direct contact with the chemical can cause skin irritation. Exposure to methylene chloride vapours can cause sluggishness, irritability, light-headedness, nausea and headaches depending on the concentration of the vapours in the air. Long-term exposure to high levels has been associated with an increased incidence of cancer in laboratory animals, and it is probably carcinogenic to humans.

When using methylene chloride-based paint strippers indoors, the air can become contaminated. People at risk include other occupants of the building, as well as those who are directly handling these products. If the object being stripped is portable, consider moving the work outdoors.

Here are some other safety practices to follow:

- before starting, turn the furnace and furnace fan off, tape over the air supply and return registers, and open windows in the room where the work is being carried out.
- ensure your work area is properly ventilated. Place an electric fan by an open window, to blow contaminated air outside.
- always wear goggles, gloves and a good quality breathing mask. If stripper gets on your skin, wash it off right away.
- if you develop breathing problems, dizziness, nausea or headaches while working with paint strippers, get some fresh air immediately. Work for 10 minutes at a time and then take a fresh air break.
- consider hiring a professional, if you do not want to be exposed to the hazards of chemical strippers.

10.3 USING HOME PRODUCTS SAFELY

The Ontario Ministry of Environment and Energy and many community-based environmental agencies provide excellent detailed information on biological alternatives to chemical-based products for home and garden use.

Pesticide Use in the Home

Many pesticide products intended for indoor use are designed to have residual activity that can persist for months. These products are often applied to areas near the floor. Because young children have a tendency to mouth objects and

to play on the floor or ground, this increases their risk of exposure to pesticides or their residues. Children can also be exposed to pesticides by playing in areas where the chemicals have been spilled, or improperly stored, and by playing with packages or equipment used in spraying.

Although concentrations and toxicities of pesticides for home use tend to be less than for some used in commercial agriculture, home gardeners must still ensure that they follow label directions and use proper hygiene to minimize exposure.

As with any drug or chemical, all pesticide products should be used with care and common sense. Safe application and storage practices can reduce the potential for accidental exposures or harmful reactions.

Safe Handling of Pesticides

- Carefully read and follow directions on the product label. Note the uses, rates, application equipment, cautions and hazards. Always wear protective clothing and safety equipment recommended on the label.
- Do not apply pesticides when wind conditions may cause drift into areas not intended for treatment.
- Do not rub your eyes or touch your mouth while working with pesticides and do not eat, drink or smoke until you have washed your hands thoroughly.
- Shower thoroughly and change your clothes after exposure to, or completing application of a pesticide. Wash the exposed clothes separately from your normal laundry.
- Post signs warning passers-by that you have treated an area with pesticides.
- Keep pets and children away from treated areas for a few days. If others are using pesticides, avoid these areas for a few days. This allows the pesticide residues to evaporate. This is particularly important for children.
- When using indoors, empty any closets, cupboards or counter tops you're treating and make sure there is adequate ventilation. Ensure any food preparation and storage areas are washed with potable water before re-using.
- Keep pesticide containers out of reach of children and do not spray around children or pets. Never store pesticides near food or drink and never transfer pesticides into another container for storage. Dispose of pesticide containers in the manner indicated on the label.






POISONING





IF A PESTICIDE POISONING OCCURS OR IS SUSPECTED, THE LABEL OR CONTAINER SHOULD BE TAKEN WHEN SEEKING HELP FROM A MEDICAL PROFESSIONAL. THE PESTICIDE LABEL IS THE SINGLE MOST IMPORTANT PIECE OF INFORMATION REGARDING A PESTICIDE, BECAUSE IT CONTAINS SECTIONS ON FIRST AID, AND TOXICOLOGICAL INFORMATION. THE SECOND MOST IMPORTANT PIECE OF INFORMATION IS THE MATERIAL SAFETY DATA SHEET (MSDS). THESE ARE AVAILABLE FOR THE MORE HAZARDOUS PRODUCTS AND HAVE A SECTION ENTITLED, TOXICITY/HEALTH EFFECTS.

Figure 10.2

PRECAUTIONARY SIGNS, SYMBOLS AND SIGNAL WORDS

Symbol	Keyword
	danger
	warning
	caution

Degree of risk

	poison
	flammable
	explosive
	corrosive

Degree of Hazard

Safe Use of Personal Insect Repellent Products

- Always read the entire label before using.
- Children may be more sensitive and at a higher risk of harmful reactions. Always supervise application of insect repellent on children. Use the least concentrated products and be extra careful to avoid contact with the eyes. Avoid spraying children's hands with repellent to reduce the chance of getting the repellent in their eyes and mouths.
- Do not use personal insect repellents on children under two years of age.
- Apply the repellent sparingly, and only when you really need protection. It should only be used on exposed skin, and over clothing. Do not use under clothing. Wash treated skin with soap and water when you return indoors or when protection is no longer needed.
- Do not get in eyes and avoid breathing spray mists. If you do get repellent in your eyes, rinse immediately with water.
- Do not use the repellent on open wounds, nor if your skin is irritated or sunburned.
- Some personal insect repellent products contain a skin lotion or sunscreen. Use these products only for their purpose as an insect repellent and according to the safe practices listed here.
- To see if you are sensitive to a particular product, apply the product to a small area of skin on your arm before general use.
- Stop using the product immediately if you experience any reactions. These may include skin or eye irritation, allergic reactions, or nervous system effects including behavioural changes or abnormal movements. Seek medical attention if symptoms persist or are severe and take the product container with you.
- Use only personal insect repellents that are registered in Canada. These have a registration number and are labelled as insect repellents for use on humans.
- Never use a product labelled as an insecticide on your body.
- Keep all insect repellent containers out of reach of children.