

Indoor Air Quality

Why is indoor air quality important?

People spend up to 90 per cent of their time indoors - at home, school and work. Poor indoor air quality may cause symptoms such as headache, wheezing, tiredness, coughing, sneezing, sinus congestion, shortness of breath, dizziness, nausea, and irritation of the eyes, nose or throat. Allergy or asthma symptoms may also get worse because of poor indoor air quality.

Poor indoor air quality is caused by indoor air pollution. By understanding some of the possible causes of this pollution, you can start to improve the quality of the air you breathe indoors.

What are the major indoor pollutants?

Many indoor pollutants exist, including the following:

Biological contaminants can come from both outside and inside the home. Examples of biological contaminants include: fungi (moulds), insects such as dust mites and cockroaches, dander from fur-bearing animals such as dogs or cats, and dusts and pollens. Biological contaminants can cause allergic symptoms. For more information, see [HealthLinkBC File #65b Indoor Air Quality: Mould and Other Biological Contaminants](#).

Combustion (burning) by-products are gases and small particles caused by the incomplete burning of fuels such as oil, gas, kerosene, wood, coal and propane. Examples of combustion by-products found indoors include fine particulate matter, carbon monoxide and nitrogen oxides. Sources include wood heaters and woodstoves, furnaces, gas stoves, fireplaces, car exhaust from an attached garage, and tobacco smoke. For more information, see [HealthLinkBC File #65c Indoor Air Quality: Combustion By-products](#) and [HealthLinkBC File #30a The Harmful Effects of Second-hand Smoke](#).

Formaldehyde and other volatile organic compounds (VOCs): Formaldehyde is a chemical found in many building materials such as plywood and particleboard, in furnishings such as furniture, drapes and carpets, and in personal care products. For example, formaldehyde is an ingredient in some nail polishes, nail glues and nail hardeners. A wide range of products, such as shampoos, eyelash glues, hair gels and liquid body soaps, contain formaldehyde-releasing chemicals. When these chemicals naturally break down, they release low doses of formaldehyde, and create a preservative effect in the product. Cleaning agents, paints, lacquers and varnishes are additional sources of VOCs. VOCs can be released from these

materials for several years. For more information, see [HealthLinkBC File #65d Indoor Air Quality: Volatile Organic Compounds](#).

Asbestos was used as an insulator and fire retardant for many years. It is sometimes still found in insulation around older hot water pipes and boilers. It is also found in old flooring material and some types of insulation used in attics and walls. Asbestos does not cause a health risk unless it is frayed or crumbling and releasing fibers into the air that can be inhaled. For more information, see [HealthLinkBC File #32 Asbestos: When Should I Worry?](#)

Radon is a naturally occurring radioactive gas given off during the decay of uranium which naturally occurs in some soil and rock. Radon gas is odourless, invisible and has no taste. It can enter a home or building directly through the building's foundation from surrounding soil. Over time, high levels of inhaled radon gas may lead to lung cancer. High levels of radon have been found in parts of interior and northern British Columbia. For more information, see [HealthLinkBC File #42 Radon in the Homes and Other Dwellings](#).

How can I improve indoor air quality?

There are 3 basic ways to improve indoor air quality:

1. **Control the source:** Remove the source of pollution or reduce the level of the emissions. This step should always be considered first to improve indoor air quality.
 - a. **Biological contaminants**
 - Keep the house clean and dust-free to reduce allergens such as dust mites, pollen and animal dander. Clean heating ducts and change furnace, humidifier and air conditioning filters regularly.
 - Use a vacuum cleaner that is equipped with a HEPA filter. You may also consider installing a built-in vacuum cleaner that vents outside the main living area, such as into the basement, crawl space or outside.
 - To stop or prevent mould, reduce humidity by venting air from moist areas, such as bathrooms, kitchens and clothes dryers, to the outside.
 - If water damage occurs, repair the source of the leak and dry out damaged carpets, underlay and building material, or consider replacing them.

- Do not carpet any area that is subject to moisture or flooding problems (e.g., certain basements).
- Regularly clean your humidifier.

b. Combustion by-products

- Follow the manufacturers' instructions for fuel burning appliances. Install, service and repair these appliances properly, change filters regularly and vent to the outside. Use fuel correctly in an EPA or CSA certified appliance.
- Do not allow smoking in or near your home.
- Inspect furnace, flues and chimneys, and repair cracks and damaged parts.

c. Volatile Organic Compounds (VOCs)

- Use products with low VOC emissions. If possible, allow gases to be given off in storage before putting new furnishings and carpets into your home. If this is not possible, try to increase the ventilation in rooms with new furniture or carpets by opening windows and doors for as long as possible over several days.
- Store paints and solvents in a separate area of your home. Use only as directed and ensure there is good ventilation when you are using these products. Recycle unwanted paints and solvents.
- Do not mix different household cleaners or solvents together as mixing products can create new pollutants, and can be extremely dangerous.

- 2. Improve ventilation:** Increase the amount of outdoor air coming indoors by keeping your home well ventilated, especially when cooking or painting. Keeping windows open and kitchen and bathroom exhaust fans turned on will improve ventilation.

Lack of proper ventilation may occur in tightly sealed buildings or those with too high a level of re-circulated building air. This may reduce indoor air quality. These types of buildings may also have higher indoor moisture or humidity levels, contributing to the growth of mould and mildew.

On days when outdoor air quality is very poor, such as during wildfires, increasing ventilation can increase indoor air pollution. In such situations consider limiting airflow from outdoors for a short period of time.

- 3. Clean the air:** Air cleaners may be used in the home in addition to improving ventilation and trying to control or eliminate sources of the pollution. Air cleaners often come in one of two forms. The most common are those cleaners designed to remove particles from the air, while less common are those designed remove specific gases and odours.

Using air cleaners

- Air cleaners vary in their cost and in how well they work. They also may have different types of filters. Mechanical or electric air filters are the most common and are designed to remove particles from the whole house (in-duct) or from a single room (portable). For example, HEPA (high efficiency particulate air) filters remove particles from the air, while activated carbon filters are designed to remove one or more gaseous pollutants.
- If you buy a portable air cleaner, review the manufacturer's specifications to make sure it is the appropriate size for the room in which you intend to use it. Use the device that best meets your needs based on the type of pollutants you wish to capture, cost, energy requirements, and maintenance requirements. Change the filters regularly.
- Ozone generators, a type of air cleaner, should not be used in your home because they produce harmful levels of ozone which can cause adverse effects on health.

For More Information

For more information about indoor air quality and your health, visit the following websites:

- Health Canada – Indoor Air Quality www.hc-sc.gc.ca/ewh-semt/air/in/index-eng.php
- The B.C. Lung Association – Air Quality www.bc.lung.ca/airquality/airquality.html or call toll-free 1-800-665-LUNG (5864)

For more HealthLinkBC File topics, visit www.HealthLinkBC.ca/healthfiles or your local public health unit.

Click on www.HealthLinkBC.ca or call **8-1-1** for non-emergency health information and services in B.C.

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