

Common Sources of Indoor Air Pollutants and Associated Health Impacts

Substance & Source	Health Impact	To Reduce Exposure . . .
<p style="text-align: center;"><u>ALDEHYDES</u></p> <p>Formaldehyde foam insulation (banned); Plywood, particle board, glues, binders; Unvented gas heaters; Some permanent press fabrics; cosmetics; Burning of wood, gas, oil and tobacco</p>	<ul style="list-style-type: none"> • irritate eyes, nose, and throat. • repeated exposure can cause reactions of hypersensitivity, such as asthma, laryngeal edema, and possibly cancer. 	<ul style="list-style-type: none"> • restrict introduction of textiles with formaldehyde • restrict introduction of new furniture containing wood composites • eliminate tobacco smoke • increase ventilation
<p style="text-align: center;"><u>ASBESTOS & FIBROUS MATERIAL</u></p> <p>Insulation from heat, cold, electricity, and noise; Fire-proofing; currently used for insulating automobile brake linings, clutch facings and automatic transmissions</p>	<ul style="list-style-type: none"> • potential for fibrosis of the lungs • potential for cancer of the pleural sac lining the lungs, peritoneal sac lining the abdomen, or cancer of the lung 	<ul style="list-style-type: none"> • have professional assess areas where asbestos is open • it is often better to enclose or encapsulate than try to remove it (i.e., prevent airborne fibres) • do not dust, vacuum or sweep if it falls on floor • instead, wipe with a wet rag or sponge and place in a dust-proof plastic bag for disposal
<p style="text-align: center;"><u>BIOLOGICAL AGENTS</u></p> <p>Viruses and bacteria in dust particles and water droplets; Mould, mildews and fungi where damp; Bacteria and moulds in stagnant humidifiers; Pollen grains, cell debris (e.g., pet dander) and mites</p>	<ul style="list-style-type: none"> • allergic reactions • aggravate asthma • affect lung function 	<ul style="list-style-type: none"> • do not use humidifiers if not needed • thoroughly clean and disinfect humidifiers weekly using a (1-part to 4-parts) chlorine bleach to water solution • keep humidifiers dry when not in use • use distilled or de-ionized water to clean ultrasonic humidifiers • wipe dust & vacuum regularly • clean heating ducts • dry out damp or mouldy areas by stopping moisture at the source or by opening a window and running an exhaust fan • use a dehumidifier or air conditioner in the summer

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<p style="text-align: center;"><u>CARBON DIOXIDE</u></p> <p>Gas formed during combustion (e.g., in gas furnaces, stoves, kerosene heaters); Gas formed while we breathe</p>	<ul style="list-style-type: none"> • high concentrations can cause headaches and drowsiness 	<ul style="list-style-type: none"> • regularly clean, adjust and properly maintain chimneys, furnaces, and other fuel-fired appliances • ensure adequate fresh air for devices that use air in their operation, such as fireplaces, furnaces, wood-burning stoves, exhaust fans and clothes dryers • ensure that there is adequate air intake per person
<p style="text-align: center;"><u>CARBON MONOXIDE</u></p> <p>Gas formed in burning; Gas stoves; Kerosene heaters; Tobacco smoke; Vehicle exhaust;</p>	<ul style="list-style-type: none"> • combines with blood and reduces ability to use oxygen • decreases ability to exercise • worsens symptoms of heart disease • high levels can cause nausea, headaches, dizziness and even death 	<ul style="list-style-type: none"> • avoid running vehicle engines in an attached garage • Never use unvented kerosene heaters • make sure fire places are drawing well and fireplaces have enough air in order to prevent “backdraughting”
<p style="text-align: center;"><u>CONSUMER PRODUCTS</u></p> <p>Include volatile organic solvents, pesticides, disinfectants, hair sprays, etc. (e.g., cleaning fluids, cleansers, paint, art supplies, aerosols, and pest control products); Some substances can remain in indoor air long after use</p>	<ul style="list-style-type: none"> • temporary dizziness on short exposure • when prolonged, irritation of eyes, and lungs • damage to nervous system, skin, liver and kidneys • potential poisonous reactions from high doses of pesticides 	<ul style="list-style-type: none"> • substitute non-toxic product alternatives (e.g., vinegar and water and baking soda) for cleaning and personal care • always use products with good ventilation • avoid using paint strippers and other strong chemicals in home (do that work outdoors) • always follow precautions and directions on the label • art supplies should be used only under well ventilated conditions
<p style="text-align: center;"><u>LEAD</u></p> <p>Mainly from dust that settles on to surfaces and then may be swallowed with food; Miniblinds - inexpensive 1” (2.54 cm) horizontal PVC (plastic) blinds made in Indonesia, China, Hong Kong, Taiwan, & Mexico; Indoor Paint - manufactured prior to 1976</p>	<ul style="list-style-type: none"> • can cause anemia, abdominal cramps, constipation, damage to brain and kidneys • children especially at risk • lead poisoning in children associated with behavioural problems, learning disabilities, hearing problems and growth retardation 	<ul style="list-style-type: none"> • keep surfaces clean, especially where food is prepared • remove implicated miniblinds from home or areas frequented by children under age six in order to prevent any immediate health impacts from lead dust transferred hand-to-mouth • use precautions when stripping cracked or chipped old paint. Never use sanding, heat guns, or blow lamps. Better to seal painted surface with vinyl wallpaper, wallboard, or paneling if not cracked

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<p style="text-align: center;"><u>MERCURY</u></p> <p>Latex paint - 30% of interior latex paint contained mercury compounds as a preservative - it was discontinued for interior latex paints in 1991, but exterior paints may still contain mercury; Broken thermometers, barometers, and regulators</p>	<ul style="list-style-type: none"> • 80% absorbed when inhaled • acute inflammation of oral mucous membrane, lungs, bronchitis, GI complaints, tremors and excitability • Chronic failure of muscle coordination and disturbances of peripheral nervous system, etc. • a single broken thermometer can lead to toxic effects and hospitalization 	<ul style="list-style-type: none"> • dispose of partly used cans of latex paint made prior to 1991 • at least use proper ventilation when using mercury-containing paints • DO NOT vacuum up mercury from a broken thermometer. Instead, call local health official for advice
<p style="text-align: center;"><u>NITROGEN OXIDES</u></p> <p>Gas formed in burning; Vehicle exhausts; Industrial emissions; Gas and wood stoves; Unvented kerosene heaters; Tobacco products</p>	<ul style="list-style-type: none"> • difficulty in breathing • prolonged exposure may cause respiratory illness 	<ul style="list-style-type: none"> • ensure adequate ventilation for gas stoves • do not use kerosene heaters
<p style="text-align: center;"><u>OZONE</u></p> <p>Electrostatic air-cleaner; Arcing electric motors; Photocopiers; Outside air</p>	<ul style="list-style-type: none"> • coughs • chest discomfort • irritation of nose, throat and windpipe 	<ul style="list-style-type: none"> • check for proper working of electrical equipment • repair indoor sources • increase ventilation if an indoor source
<p style="text-align: center;"><u>PARTICULATE MATTER</u></p> <p>Cooking; Cleaning; Heating, venting and air condition systems; Consumer products: spray disinfectants, cleaners, repellents; Unvented clothes dryer; Tobacco smoke; Outdoor particles</p>	<ul style="list-style-type: none"> • the smaller the particle, the greater the penetration • discomfort and perhaps disease of the lungs • aggravation of existing heart or lung disorders and asthma symptoms • May increase the effects of other lung irritants • also dependent on the nature of the particle the matter it attracts 	<ul style="list-style-type: none"> • avoid exposure to tobacco smoke wherever possible • ensure wood- and coal- burning stoves are properly installed and maintained and have enough ventilation • ensure that filters on furnaces and air conditioners are high efficiency, properly installed, cleaned and replaced regularly • avoid use of aerosol products indoors. • ensure proper ventilation of clothes dryer • use distilled or deionized water in ultrasonic humidifiers

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<p><u>RADON</u></p> <p>A gas, which can form on the surface of soil particles and escape into tiny airspaces in the ground; Sucked into house through openings in basement floor.</p>	<ul style="list-style-type: none"> • no symptoms of irritation or discomfort • alpha radiation may damage lung tissue and cause cancer • lung cancer risk second only to that of smoking 	<ul style="list-style-type: none"> • if concerned, measure annual average concentration in living area of house • better to divert radon for the soil beneath house to outside and seal basement than to simply increase ventilation
<p><u>TOBACCO SMOKE</u></p> <p>Sidestream smoke from the end of a burning tobacco product; Mainstream smoke which is being inhaled;</p>	<ul style="list-style-type: none"> • headache, nausea, loss of appetite • irritation of the eyes, nose and throat • increased risk of lung cancer, lung and heart disease • unborn children 	<ul style="list-style-type: none"> • avoid exposure wherever possible
<p><u>WATER VAPOUR (HUMIDITY)</u></p> <p>Warm air can hold more than cool air; Washing, bathing, cooking; Unvented clothes dryer; Breathing; Outdoor air; Condensation from winter</p>	<ul style="list-style-type: none"> • low: diverts effect, but aggravates asthma • high (high temp): heat exhaustion • moulds and fungi growing within building can cause allergies and serious respiratory illnesses 	<ul style="list-style-type: none"> • find sources of water intrusion and correct them • proper ventilation • avoid humidifiers if possible • keep humidity between 30%-55%, never above 70% • keep house clean
<p><u>BUILDING MATERIALS</u></p> <p>New materials; New furnishings</p>	<ul style="list-style-type: none"> • depends upon the specific pollutant(s) 	<ul style="list-style-type: none"> • choose low emission products • air out new homes for the first several months • increase ventilation in rooms with new furniture, carpet, etc. • use only a balanced house ventilation system

Source: Health and Environment: A Handbook for Health Professionals (DRAFT, 1995). The Great Lakes Health Effects Program, Health Protection Branch, Health Canada, and The Environmental Health and Toxicology Unity, Public Health Branch, Ontario Ministry of Health.