<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>SOURCE</th>
<th>HEALTH EFFECTS</th>
<th>PREVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>• Unvented kerosene and gas space heaters &lt;br&gt; • Leaking chimneys and furnaces &lt;br&gt; • Back-drafting from furnaces, gas water heaters, wood stoves, and fireplaces &lt;br&gt; • Gas stoves &lt;br&gt; • Generators and other gasoline powered equipment &lt;br&gt; • Automobile exhaust from attached garages &lt;br&gt; • Tobacco smoke &lt;br&gt; • Incomplete oxidation during combustion in gas ranges and unvented gas or kerosene heaters may cause high concentrations of CO in indoor air. &lt;br&gt; • Worn or poorly adjusted and maintained combustion devices (e.g., boilers, furnaces) can be significant sources, or if the flue is improperly sized, blocked, disconnected, or is leaking.</td>
<td>At low concentrations &lt;br&gt; • fatigue in healthy people and chest pain in people with heart disease. &lt;br&gt; At moderate concentrations &lt;br&gt; • Angina (chest pain) &lt;br&gt; • impaired vision &lt;br&gt; • reduced brain function &lt;br&gt; At higher concentrations &lt;br&gt; • impaired vision and coordination &lt;br&gt; • headaches &lt;br&gt; • dizziness &lt;br&gt; • confusion &lt;br&gt; • nausea &lt;br&gt; • Can cause flu-like symptoms that clear up after leaving home. &lt;br&gt; Fatal at very high concentrations. Acute effects are due to the formation of carboxyhemoglobin in the blood, which inhibits oxygen intake.</td>
<td>• Keep gas appliances properly adjusted. &lt;br&gt; • Consider purchasing a vented space heater when replacing an unvented one. &lt;br&gt; • Use proper fuel in kerosene space heaters. &lt;br&gt; • Install and use an exhaust fan vented to outdoors over gas stoves. &lt;br&gt; • Open flues when fireplaces are in use. &lt;br&gt; • Choose properly sized wood stoves that are certified to meet EPA emission standards. Make certain that doors on all wood stoves fit tightly. &lt;br&gt; • Have a trained professional inspect, clean, and tune-up central heating system (furnaces, flues, and chimneys) annually. Repair any leaks promptly. &lt;br&gt; • Do not idle the car inside garage.</td>
</tr>
<tr>
<td>Asbestos</td>
<td>Asbestos has not been used in building projects since 1989, therefore all current sources of asbestos can be found in the following deteriorating, damaged, or disturbed materials built before 1989: &lt;br&gt; • insulation &lt;br&gt; • fireproofing &lt;br&gt; • acoustical materials &lt;br&gt; • floor tiles</td>
<td>The most dangerous asbestos fibers are too small to be visible. &lt;br&gt; • No immediate symptoms, but after they are inhaled, they can remain and accumulate in the lungs and can cause lung cancer, mesothelioma (a cancer of the chest and abdominal linings), and asbestosis (irreversible lung scarring that can be fatal). Smokers are at higher risk of developing asbestos-induced lung cancer.</td>
<td>Steps to Reduce Exposure &lt;br&gt; • It is best to leave undamaged asbestos material alone if it is not likely to be disturbed. &lt;br&gt; • Use trained and qualified contractors for control measures that may disturb asbestos and for cleanup. &lt;br&gt; • Follow proper procedures in replacing wood stove door gaskets that may contain asbestos.</td>
</tr>
</tbody>
</table>
| **Formaldehyde** | Can currently be found in many of the following products:  
- Pressed wood products (hardwood plywood wall paneling, particleboard, fiberboard)  
- Furniture made with these pressed wood products  
- Urea-formaldehyde foam insulation (UFFI)  
- Environmental tobacco smoke  
- Durable press drapes and other textiles  
- Glues. | Formaldehyde, a colorless, pungent-smelling gas, can cause:  
- Watery eyes  
- Burning sensations in the eyes and throat  
- Wheezing and coughing  
- Fatigue  
- Skin rash  
- Nausea, and difficulty in breathing in some humans exposed at elevated levels (above 0.1 parts per million)  
- High concentrations may trigger attacks in people with asthma.  
- There is evidence that some people can develop a sensitivity to formaldehyde and cause severe allergic reactions. | • Use "exterior-grade" pressed wood products (lower-emitting because they contain phenol resins, not urea resins).  
• Use air conditioning and dehumidifiers to maintain moderate temperature and reduce humidity levels.  
• Increase ventilation, particularly after bringing new sources of formaldehyde into the home.  
• Ask about the formaldehyde content of pressed wood products, including building materials, cabinetry, and furniture before you purchase them.  
• Some studies suggest that coating pressed wood products with polyurethane may reduce formaldehyde emissions for some period of time. To be effective, any such coating must cover all surfaces and edges and remain intact. Increase the ventilation and carefully follow the manufacturer instructions while applying these coatings. |
|---|---|---|
| **Lead** | Lead-based paints in houses built before 1960  
• Some homes built as recently as 1978 may also contain lead paint.  
• Contaminated soil  
• Dust  
• Drinking water. | Lead at high levels can cause:  
- Convulsions  
- Coma  
- Death.  

**Lower levels of lead can cause:**  
- Adverse health effects on the central nervous system  
- Kidney  
- Blood cells. Blood lead levels as low as 10 micrograms per deciliter can impair mental and physical development.  

**The effects of lead exposure on fetuses and young children can be severe.** Fetuses, | • Keep areas where children play as dust-free and clean as possible.  
• Leave lead-based paint undisturbed if it is in good condition; do not sand or burn off paint that may contain lead.  
• Do not remove lead paint yourself.  
• Do not bring lead dust into the home.  
• If your work or hobby involves lead, change clothes and use doormats before entering your home.  
• Eat a balanced diet, rich in calcium and iron. |
| **Lead** | infants, and children are more vulnerable to lead exposure than adults since lead is more easily absorbed into growing bodies, and the tissues of small children are more sensitive to the damaging effects of lead. Children may have higher exposures since they are more likely to get lead dust on their hands and then put their fingers or other lead-contaminated objects into their mouths. The health effects to children can include:  
• Delays in physical and mental development  
• Lower IQ levels  
• Shortened attention spans  
• Increased behavioral problems. |
| **Nitrogen Dioxide (NO₂)** | NO₂ acts mainly as an irritant affecting the mucosa of the eyes, nose, throat, and respiratory tract. Low level NO₂ exposure may cause increased bronchial reactivity in some asthmatics, decreased lung function in patients with chronic obstructive pulmonary disease and increased risk of respiratory infections, especially in young children.  
  
  • Eye, nose, and throat irritation.  
  • Impaired lung function  
  • Increased respiratory infections in young children  

Extremely high-dose exposure (as in a building fire) to NO₂ may result in:  
  • Pulmonary edema (fluid in the lung) and lung injury. |
| **Pesticides** | Pesticides are chemicals that are used to kill or control pests which include bacteria, fungi, and other organisms, in addition to insects and  
• Irritation to eye, nose, and throat  
• Increased risk of cancer.  
• Headache  
• Dizziness |
|  |  
• Keep gas appliances properly adjusted.  
• Consider purchasing a vented space heater when replacing an un-vented one.  
• Use proper fuel in kerosene space heaters.  
• Install and use an exhaust fan vented to outdoors over gas stoves.  
• Open flues when fireplaces are in use.  
• Choose properly sized wood stoves that are certified to meet EPA emission standards. Make certain that doors on all wood stoves fit tightly.  
• Have a trained professional inspect, clean, and tune-up central heating system (furnaces, flues, and chimneys) annually. Repair any leaks promptly.  
• Do not idle the car inside garage.  
• Read the label and follow the directions. It is illegal to use any pesticide in any manner inconsistent with the directions on its label.  
• Mix or dilute outdoors. |
# Pesticides

Pesticides are classed as semi-volatile organic compounds and include a variety of chemicals in various forms. Pesticides are inherently toxic.

**Exposure to high levels of cyclodiene pesticides, commonly caused by misapplication, has produced various symptoms, including:**

- Headaches
- Dizziness
- Muscle twitching
- Weakness
- Tingling sensations
- Nausea.

- Might cause long-term damage to the liver and the central nervous system, as well as an increased risk of cancer.

There is no further sale or commercial use permitted for the following cyclodiene or related pesticides: chlordane, aldrin, dieldrin, and heptachlor. The only exception is the use of heptachlor by utility companies to control fire ants in underground cable boxes.

- Apply only in recommended quantities.
- Increase ventilation when using indoors. Take plants or pets outdoors when applying pesticides/flea and tick treatments.
- Use non-chemical methods of pest control where possible.
- If you use a pest control company, select it carefully.
- Do not store unneeded pesticides inside home; dispose of unwanted containers safely.
- Store clothes with moth repellents in separately ventilated areas, if possible.
- Keep indoor spaces clean, dry, and well ventilated to avoid pest and odor problems.

Unless you have had special training and are certified, never use a pesticide that is restricted to use by state-certified pest control operators. Such pesticides are simply too dangerous for application by a non-certified person. Use only the pesticides approved for use by the general public and then only in recommended amounts; increasing the amount does not offer more protection against pests and can be harmful to you and your plants and pets.

---

# Radon

- Radon can enter a home through cracks and openings in floors and walls that are in contact with the ground.
- Radon in generated through the decomposition of granite rock, specifically, Radon-222 is the decay product of radium-226. Radon-222 and its parent, radium-226, are part of the long decay chain for uranium-238.
- radium-226 and radon-222 are

**Exposure to radon contributes to lung cancer:**

- Smoking, radon, and secondhand smoke are the leading causes of lung cancer. Although lung cancer can be treated, the survival rate is one of the lowest for those with cancer.
- **Smoking** is the leading cause of lung cancer. A smoker who is also exposed to radon has a much higher risk of lung cancer.
- Radon is the number one cause of lung cancer among non-smokers, according to EPA

**For Existing Homes:** Test for radon — testing is the only way to know if radon is in your home. Do-it-yourself test kits are convenient and accessible, or you may choose to have a professional test your home.

- If the test result indicates your radon level is too high a qualified radon service professional can install a radon mitigation system. There are several methods this contractor can use to lower radon levels. Some techniques
| Present in almost all rock and all soil and water. |
| • The amount of radon in the soil depends on soil chemistry, which varies from one house to the next. |
| • The amount of radon that escapes from the soil to enter the house depends on the weather, soil porosity, soil moisture, and the suction within the house. |

| Estimates. Overall, radon is the second leading cause of lung cancer. Radon is responsible for about 21,000 lung cancer deaths every year. About 2,900 of these deaths occur among people who have never smoked. |
| • **Secondhand smoke** is the third leading cause of lung cancer and responsible for an estimated 3,000 lung cancer deaths every year. Smoking affects non-smokers by exposing them to secondhand smoke. |

| Prevent radon from entering your home while others reduce radon levels after it has entered. |
| • **For New Construction**: Radon-resistant new construction (RRNC) draws radon from the soil and vents it through a pipe to the roof, preventing its entry into the house. New home buyers should ask their builder to include RRNC features. All new homes, even new RRNC ones, should be tested for radon. |