

Wood Smoke and Your Health

Many people don't think of the smoke from their wood stove or fireplace as air pollution. Some people even like the smell of wood smoke. But wood smoke is one of the main sources of air pollution in Washington. Home wood burning devices such as wood stoves and fireplaces put out hundreds of times more air pollution than other sources of heat such as natural gas or electricity.

What's in wood smoke?

Much like cigarette smoke, wood smoke contains hundreds of air pollutants that can cause cancer and other health problems.

Tiny smoke particles:

- can cause chemical and structural changes in lungs;
- reduce lung function;
- reduce resistance to infection; and
- cause cancer.

Carbon monoxide:

- interferes with the blood's ability to carry oxygen to the brain, which impairs thinking and reflexes;
- causes heart pain;
- linked to lower birth weights and increased deaths in newborns; and
- can cause death.

Formaldehyde and other organic gases:

- irritate eyes, nose, and throat;
- inflame mucous membranes, causing irritation of the throat and sinuses;
- interfere with lung function;
- can cause allergic reactions; and
- cause nose and throat cancer in animals, and may cause cancer in humans.

Nitrogen oxides

- irritate eyes and respiratory system;
- may damage the immune system by impairing ability to fight respiratory infection; and
- affect lung function.

WHY IT MATTERS

In many areas of Washington, pollution from wood smoke is causing significant health effects. These effects include increases in asthma and other lung diseases, heart attacks, and strokes.

Health effects also have an economic cost for things such as emergency room and doctor visits, and missed work and school days.

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Special accommodations:

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Health effects

Breathing wood smoke can:

- reduce lung function, especially in children;
- worsen existing lung diseases such as asthma, emphysema, pneumonia and bronchitis;
- aggravate heart disease;
- increase the risk of lower respiratory diseases;
- irritate eyes, lungs, throat and sinuses; and
- trigger headaches and allergies.

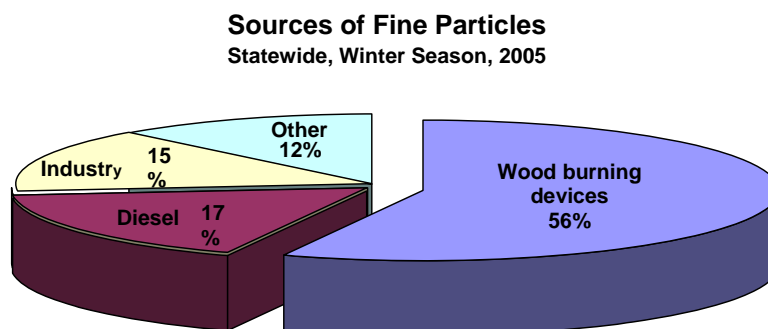
Long-term exposure to wood smoke may lead to:

- chronic lung disease;
- chronic bronchitis; and
- increased risk of cancer and genetic mutations (based on animal studies).

The tiny particles in wood smoke are especially dangerous to health. Because they are so small, our bodies' natural defenses cannot filter them out. Instead, we inhale them deep into our lungs, where they become lodged. Cancer-causing and toxic compounds often attach themselves to the tiny particles and hitchhike on them into the lungs. Wood stoves and fireplaces release more of these particles into the air in Washington each year than industry and motor vehicle exhaust sources combined.

How much pollution comes from wood smoke?

In winter, more than half (56 percent) of Washington's fine particle air pollution comes from wood burning devices such as wood stoves and fireplaces.



Who is most at risk?

Those most at risk from wood smoke include:

- fetuses, infants and children;
- people with asthma, bronchitis, emphysema, or pneumonia;
- people with other lung, heart, or circulatory system diseases;
- the elderly;
- people with allergies; and
- cigarette smokers and ex-smokers.

Infants and young children are the most vulnerable to wood smoke because it interferes with the normal development of their lungs. It also increases their risk of respiratory tract infections, which are a major cause of early childhood death and illness.

University of Washington research shows that Seattle preschool children who live in neighborhoods with higher wood smoke levels have more respiratory disease symptoms than preschool children who live in areas with lower wood smoke levels. Tests also show reduced lung function in asthmatic children in smoky Seattle neighborhoods in the winter.

Even healthy people are at risk from wood smoke. Those who are physically active are advised to reduce their physical activity when wood smoke levels are high.

Wood smoke gets around

During the winter heating season, Washington's weather patterns often keep the air from circulating as it usually does. Any pollution in the air becomes trapped and concentrated near the ground during these periods. Unfortunately, even staying indoors doesn't keep you from being exposed to this pollution. Wood smoke particles are so tiny they seep into houses even when doors and windows are closed.

Even people who don't use a wood stove or fireplace can be at risk. If you burn wood, your neighbors may be breathing the smoke. A recent study shows that wood smoke pollution indoors can be almost as high as the pollution levels outdoors, even in homes that do not burn wood.

What you can do

- Replace wood heat with cleaner heating choices such as gas, electric, or oil heat.
- Be sure your house is properly weatherized to use energy in the most efficient way possible.
- If you must use wood, replace older stoves with newer certified cleaner-burning models.

- If you heat with wood, learn the correct way to use your stove and reduce its pollution. You can reduce smoke by burning properly:
 - Burn only dry, seasoned wood. Be sure your firewood has been split and dried for at least one year. Store it under cover.
 - Never burn wet, painted, stained or treated wood; colored newsprint; plastic; garbage; diapers; or magazines.
 - Burn small, hot fires. This helps the wood burn completely and cleanly. Never allow the fire to smolder. This wastes wood, produces little heat, and causes a lot of smoke.
 - Make sure your fire gets enough air. Dampering down too much can cause smoldering. You can tell if your fire has enough air by checking the smoke coming from your chimney. You should see only heat waves. If you see smoke, increase the air supply to your fire.
 - Make sure your wood stove is the right size for its space. A stove that is too large for the space it is heating will have to be damped down, causing more smoke. Make sure your stove is properly installed.

For more information

- For information on Washington's wood stove and fireplace laws and regulations, contact Ecology's Wood Stove Coordinator:

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(360) 407-6978
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- For information on cleaner sources of heat, call the Washington State Energy Office Toll Free Energy Hotline: 1-800-962-9731.
- For information about home heating burn bans in your area, visit Ecology's web site at http://www.ecy.wa.gov/programs/air/outdoor_woodsmoke/burn_ban.htm
- See Ecology's more detailed publication "Health Effects of Wood Smoke" online at <http://www.ecy.wa.gov/pubs/92046.pdf>