

Wildfire Smoke and Ash: Health Effects and Strategies to Reduce Risk

Smoke from wildfires is a mixture of gases and fine particles from burning trees and other plant materials. After a wildfire, health risks can be caused by breathing in smoke and ash. A major concern raised by the public is whether they run an increased risk of cancer or other long-term health impacts from exposure to wildfire smoke. In general, the long-term risk from short-term smoke exposure is quite low. Smoke-related health problems depend on many factors, such as:

- The level and duration of smoke exposure
- Your age
- Your susceptibility including presence or absence of pre-existing lung or heart disease

Exposure to carbon monoxide (a colorless, odorless gas found in smoke) during a wildfire does not pose a significant threat except to some sensitive individuals and to firefighters close to the fire line. Most healthy adults and children will recover quickly from smoke exposures and will not suffer long-term effects, but certain sensitive populations may experience more severe short-term and chronic symptoms.

Health Effects of Wildfire Smoke and Ash

The principal public health threat from short-term exposure is considered to come from particulate matter. Fine particles are linked to increased aggravation of pre-existing respiratory and cardiovascular disease. Signs that smoke may be affecting you include:

- Coughing
- Scratchy throat
- Irritated sinuses
- Shortness of breath
- Chest pain
- Headache
- Irritated eyes
- Runny nose
- Asthma exacerbation

People with chronic lung or heart disease may experience one or more of the following symptoms after smoke exposure:

- Shortness of breath
- Chest tightness
- Pain in the chest, neck, shoulder or arm
- Palpitations
- Unusual fatigue
- Lightheadedness

The elderly and children may also be especially sensitive to the effects of smoke exposure. The elderly may be more affected because respiratory defenses may decline with age. Children are more sensitive because their lungs are still developing, they spend more time outdoors, and they inhale more air per pound of body weight.

Ash from wildfires may accumulate on indoor and outdoor surfaces. It may be irritating to the skin, nose and throat. Ash, when inhaled, can cause coughing as well as worsen respiratory symptoms.

Always consult your doctor if you experience chest pain, chest tightness, shortness of breath, or increased fatigue.

Strategies to Reduce Effects of Wildfire Smoke and Ash

- Stay indoors with the windows and doors closed. Homes with air-conditioning can be turned on to the “recirculate” setting. Ensure that the furnace filter is changed at appropriate intervals.
- When riding in a car, keep windows and vents closed. You can turn on the air-conditioning using recirculated air to reduce the amount of outside air being drawn into the car.
- Decrease activity to lower the dose of inhaled air pollutants.
- Reduce other sources of indoor pollution (cigarette smoke, gas, propane, wood-burning stoves and furnaces).
- Additional room or central-air filtration systems may help remove airborne particles but they need to adequately filter the area. Keep in mind that some electronic air cleaners and ozone-generating “filters” can generate dangerous amounts of ozone and do not remove harmful air contaminants.
- People with pre-existing health conditions and sensitive populations should find a “clean air” shelter, which may be in their home, in the home of a relative or in a community-provided clean air shelter.
- Avoid spreading ash in the air by wetting down covered surfaces before removal. Do not use leaf blowers or shop-vacuums.
- Wash any home-grown fruits or vegetables before eating.
- Wear gloves, long sleeved shirts, and long pants when handling ash to avoid skin contact.
- Do not allow children or animals to play in ash.

Using Masks for Protection

- In general, do not rely on dust masks for protection. Paper “comfort” or “dust” masks commonly found in hardware stores are designed to trap large particles like sawdust, not small particles from smoke.
- Bandanas (wet or dry) offer little protection
- Surgical masks are designed to filter air coming out of the mouth and do not provide a good seal to prevent inhalation of small particles.

- Masks may be detrimental by giving wearers a false sense of security leading to an increase in physical activity and time spent outdoors, resulting in increased exposures.
- A fitted mask (OSHA N95) can be used to reduce smoke exposure unless it interferes with breathing.

Important points to remember if wildfire smoke is present:

- Stay inside with the windows and doors shut.
- Use the recycle or re-circulate mode on air conditioners in the home or car.
- Avoid cooking or vacuuming, both of which can increase pollutants indoors.
- Avoid activity or physical exertion.
- If you have asthma, follow your asthma action plan.
- Keep at least a five-day supply of medications available.
- Contact your doctor if you experience chest pain, chest tightness, shortness of breath, or severe fatigue.
- Drink lots of water to keep airways moist.
- Dust masks are generally ineffective in filtering the dangerous particles in smoke.

Resources

- Fire Safety Fact Sheet:
www.bt.cdc.gov/disasters/
- Wildfire Smoke-A Guide for Public Health Officials:
www.oehha.ca.gov/air/risk_assess/wildfirev8.pdf
- How Smoke from Fires Can Affect Your Health:
www.epa.gov/air
- Wildland Fire Smoke and Your Health:
www.nps/archive/zion/Fire/SmokeHealth.htm
- Safe Clean Up of Fire Ash:
www.calepa.ca.gov/Disaster/Documents/FireAsh.pdf
- Air Quality Index-A Guide to Air Quality and Your Health:
www.airnow.gov/index.cfm?action=aqibroch.aqi#2