

Indoor Air Quality Problems at Home, School, and Work

What are indoor air quality problems?

Indoor air quality problems are problems with how clean the air we breathe is in buildings such as homes, schools, and workplaces. Poor or inadequate indoor air quality can cause breathing problems and other medical issues. Because we spend so much time indoors, including at work and at home, we are at risk of having symptoms related to the quality of indoor air. People often think more about outdoor air pollution, but it is important to think about the quality of our air indoors as well.



What causes indoor air problems?

Indoor air problems can be caused by a variety of factors related to the building and what people are doing in it, whether the building is a home, school, or workplace. Usually problems result from a combination of issues, such as a source of contaminants from inside or outside the building and inadequate ventilation. Some problems may relate to exposure to substances a person is allergic to while other exposures may cause irritation or injury to the airways or lungs.

Ventilation is supposed to exchange indoor air for clean outdoor air. Ventilation can contribute to the problem if there is an inadequate building ventilation system, if the source of the indoor air problem is stronger than the ability of the ventilation to clear it, or if the outdoor air that is brought into the building is polluted.

Indoor exposures that can cause or worsen respiratory problems include:

- Cleaning products and disinfectants, particularly ones with fragrances and/or that cause strong odors
- Mold and dampness in water-damaged buildings
- Indoor tobacco smoking, both direct and second-hand
- Pets such as dogs, cats, and birds
- Dust mites, which can be found in carpeting, mattresses, pillows, and furniture
- Pests including cockroaches and rodents, and pest control products
- Heating and machinery such as furnaces and their filters
- Electric generators used indoors

- Indoor cooking
- Materials or processes associated with construction or renovations
- New furniture, carpeting, or other products which can off-gas volatile organic compounds (VOCs)
- Hobby supplies and activities that release particles or chemicals in the air
- Outdoor air pollution from vehicles, fires, and other outdoor sources

Who gets sick because of indoor air problems?

People who have allergies and/or asthma are more likely to experience symptoms related to indoor air quality, but anyone could potentially get sick or be affected from some exposures. People with asthma may notice more asthma symptoms at home if the home has a problem with air quality. Schools can also have some of these issues, as can office buildings, stores, and healthcare facilities. If the conditions of the workplace make a person's asthma symptoms worse, this is called work-exacerbated asthma (WEA). See the ATS Patient Information Series fact sheet on WEA at www.thoracic.org/patients.

What are the symptoms caused by indoor air problems?

Many symptoms may be associated with exposure to indoor air problems, including

- Trouble breathing
- Wheezing
- Coughing
- Runny/stuffy nose
- Dry/itchy eyes

- Skin rash
- Headaches
- Fatigue

Symptoms may come and go and you may notice a pattern of having more symptoms during or just after you are in a place that has problems with indoor air quality.

How do I know if there is a problem with the air at my home or workplace?

You may suspect that there is a problem with the air quality if you have the above symptoms when you are in the particular building, but you do not have them when you are away from the building. The building could be a home, school, store or workplace. For example, if you have trouble breathing when you are at school but your breathing improves at home, the problem may be related to the air quality at your school. Take note if there is a particular time or place where your symptoms occur, or if there are any activities, events or products that trigger your symptoms. It can be useful to use a diary to keep track of the time, place, and duration of your symptoms. You may want to discuss the symptoms with your healthcare provider to determine if there is a pattern that could be associated with indoor air quality problems.

How can I prevent indoor air problems at home?

Most indoor air quality problems at home can be prevented or controlled. Ideally, you want to find and eliminate (if possible) sources of exposure. You want to be sure you have good ventilation (including air exchange and well maintained heating and cooling equipment). This involves determining where and when your symptoms occur. You may notice that your symptoms are worse during a particular activity such as cleaning or doing a hobby that uses chemical products. You may notice they are worse in a particular room in the house.

Questions you may want to ask if you suspect an indoor air quality problem at home include:

- Is anybody smoking inside?
- What cleaning products or pesticides are used and how frequently?
- Has there been recent water damage such as broken pipes or leaking roof? Do you see areas of water leakage, dampness, or mold?
- Are fuel-burning appliances such as heaters or stoves venting poorly?
- Did your home have recent construction done?
- Could paint, insulation, carpets, or floor coverings be contributing?
- Are there outdoor sources of exposure such as car exhaust?
- Is the ventilation system adequate? Keep in mind that sealing or insulating houses to make them more energy efficient may reduce fresh air intake.
- Are there any unusual odors? Keep in mind you cannot smell all air pollutants.

It is important to address any of the above issues promptly.

For example, leaky pipes should be repaired and damp wall or carpeting should be replaced. You can learn more about mold and health at the United States Environmental Protection Agency website (<https://www.epa.gov/mold/mold-and-health>). Ensure heating, ventilation and air conditioning (HVAC) servicing is up to date. This may require talking to your landlord if you cannot do the work yourself. Always follow an indoor no smoking policy.

What if I think there is a problem at my child's school?

If you suspect that your child's symptoms are related to indoor air at school, you can start by discussing the issue with a teacher, school nurse, or other parents, to find out if other children are experiencing symptoms as well. You may also wish to speak with your child's healthcare provider. Tools for Schools provided by the United States Environmental Protection Agency provides information to improve the indoor air quality in schools (<https://www.epa.gov/iaq-schools>).

I am concerned about the air quality at my job—what can I do?

If you have concerns about the indoor air quality at your workplace, you should discuss this with your supervisor at work and/or your healthcare provider.

For more information about workplace-related lung problems see the American Thoracic Society information sheet on work-related lung diseases (www.thoracic.org/patients).

A resource for more information about the indoor air environment in the workplace can be found at the National Institute for Occupational Safety and Health website for Indoor Environmental Quality (<https://www.cdc.gov/niosh/topics/indoorenv/default.html>).

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Resources

American Thoracic Society

- www.thoracic.org/patients

American Lung Association

- <http://www.lung.org/our-initiatives/healthy-air/indoor/>

U.S. Environmental Protection Agency (EPA)

- <https://www.epa.gov/indoor-air-quality-iaq>

U.S. Occupational Safety and Health Administration (OSHA)

- <https://www.osha.gov/SLTC/indoorairquality/>

National Institute for Occupational Safety and Health

- www.cdc.gov/niosh/topics/indoorenv/default.html

California Dept of Public Health

- <https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/WRAPP/Pages/WRAPP.aspx>

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