



IAQ (INDOOR AIR QUALITY): IS YOUR HOUSE MAKING YOU SICK?

Approximately 70% of asthmatics have allergy-induced asthma. AAFA-TX teaches how to identify and eliminate the most common allergens – pet dander, dust, dust mites, mold, roach droppings, smoke and pollens. All agree outdoor air pollution and ozone have a bad health impact for those with asthma or allergies, too. We're told on high ozone days to remain indoors, but is your home's indoor air quality (IAQ) as bad as, or worse than, outdoor air quality? And is it making you sick?

Indoor air pollution is one of the top 5 environmental health risks. If you feel better when you leave your home than you do when inside, you might be having allergic reactions to the air inside. Poor indoor air quality (IAQ), although not a true allergen, can trigger asthma flares, be a cause of sore throats and hoarseness, cause red and itchy eyes, rhinitis (runny nose), headaches, general crankiness, and even fatigue due to allergic reactions.

How can you tell if your house has poor IAQ?

- ✓ When you walk into your home does the air smell “stuffy” or stale?
- ✓ Can you smell lingering, unpleasant odors – from pets, mold, cooking or smoke?
- ✓ When you're inside, are your eyes, nose or throat irritated?
- ✓ Can you see mold or mildew on surfaces in your home?
- ✓ Is it too humid (over 60%) or too dry (under 30%)?
- ✓ Is furniture covered with dust or pet hair?

If you answered yes to some or all of these questions, then you may have poor IAQ in your home.

There are some irritants that affect your home's indoor air quality that aren't easily detected without scientific equipment: radon gas seepage; gases that contain carbon monoxide or nitrogen dioxide from poorly ventilated appliances or vehicles; pesticides, insecticides, herbicides, fungicides or rat poisons that are stored too close to the living quarters of the home; asbestos from deteriorating insulation. All of these chemical irritants cause poor air quality– and poor air quality, indoor or out, DOES affect your health.

We asked Dr. Richard Corsi, PhD, the ECH Bantel Professor of Professional Practice in the Department of Civil, Architectural and Environmental Engineering at The University of Texas at Austin about pollutants found in the home that can affect allergies or asthma. Dr. Corsi serves as Director of a new National Science Foundation graduate program on Indoor Environmental Science and Engineering and focuses on sources, physics and chemistry of indoor air pollution.

Dr. Corsi believes indoor air pollutants are so numerous an entire book could be written on the subject. He lists just three that are common in many homes: 1) **Radon gas**, which originates from radium in soil below buildings, and is possibly the greatest environmental health risk to Americans. The second leading cause of lung cancer in the United States, it is responsible for nearly 20,000 deaths per year. While Texans aren't exposed to as much radon as others, there are “pockets” of elevated radon levels in the Texas Hill Country and West Texas. 2) **Carbon monoxide**, an important killer accounting for approximately 600 deaths a year in the United States, many from faulty space heaters. Many people are harmed by low-level exposure to carbon monoxide which causes prolonged flu-like symptoms that are often mistaken as flu by physicians. Unfortunately, most carbon monoxide detectors are not sensitive enough to identify low level exposures. 3) **Formaldehyde**, which is detectable in almost every home. There is increasing evidence of its toxicity and effects on the family. Its main source is man-made wood products - pressed-wood or reconstituted wood - commonly used in modern construction, including particleboard used for kitchen and closet shelving and medium density fiberboard used in furniture. Formaldehyde can cause irritation to human eyes, nose, throat and the upper-respiratory system imitating rhinitis, cold, flu and allergy symptoms.

Living in a new house can affect your health; these homes often have high levels of **formaldehyde** that decrease slowly over the first year or two. High levels of other chemical compounds are often found in new homes and can be irritating to the upper respiratory system, or can cause slight and persistent odors. **Carpet** emits a wide range of volatile organic compounds (VOCs); some levels remain high several weeks to months in new or remodeled homes. **Latex paint** also emits a small number of VOCs that can linger in homes for months to years.

New wood products in homes always lead to high levels of chemicals known as *terpenes and terpenoids*. Dr. Corsi's team at UT Austin measures these chemical levels in homes and they are tens to hundreds of times what would be found outdoors. These chemicals are generally harmless, but if any ozone is around (outdoor or emitted from indoor ozone-generating devices) it can react with these terpenes and terpenoids and lead to by-products that are not so harmless & can be irritating to the eyes and upper-respiratory system. There is increasing evidence of the importance of these *reactions between terpenes and ozone*. Terpenes are also used in the wonderfully scented products – think lemon, orange, pine scented cleaners and fragrances- Americans enjoy bringing into their homes.

Dr. Corsi cautions consumers to be wary of claims regarding indoor air purifiers as a way to “clean or rid indoor air” of pollutants and allergens. Our hair and computer keyboard both remove allergens from air but neither is worth marketing as an air purifier. In general, an **effective air purifier** must be designed to treat a *volume of air per minute comparable to or greater than the air flow rate through the room*. An air purifier might be quite “efficient,” removing a large fraction of particles that enter the device, but may be ineffective if very little air flows through the device. The clean air delivery rate (CADR) is calculated by multiplying the purifier's removal efficiency for a pollutant or particles, by the air flow rate through the device. Generalizing, devices with CADR greater than 300 cubic feet per minute (cfm) can be quite effective for removing airborne particles, including allergens, in a typical bedroom.

“My colleagues and I have done extensive testing in large lab chambers on a wide range of air purifiers: portable HEPA filtration units, ion generators and ozone generators. I have even tested several in my own home. For comparably-priced systems (\$200 to \$400 range) we found *portable HEPA filtration systems to be much more effective at removing a wider range of particles* than the ion generators we tested. Every ion generator we tested also emitted some incidental ozone. We tested explicit ozone generators in both the lab and in homes. These devices are ineffective at removing particles from air and actually increase levels of ultra-fine particles. They also emit relatively large amounts of ozone, a pollutant that should be avoided indoors. **Ozone reacts with almost all indoor surfaces and terpenes and terpenoids** in indoor air which can form a wide range of irritants, including formaldehyde, and they can be very high when an ozone generator is used in the presence of scented products like cleaners, deodorizers, perfumes and colognes” states Dr. Corsi.

We asked Dr. Corsi if **air duct cleaning** is an efficient and effective method to rid our homes of allergens. “Basically, there are **two general types of problems where the benefits of duct cleaning are quite different**. 1) In situations where there is obvious mold growth, insect or rodent infestation or excessive dust/dirt accumulation, then duct cleaning should be considered as a temporary way to fix the problem. However, it's not the final solution. The **best solution is to discover and eliminate the root cause** of the original problem. 2) For every day scenarios (none of the problems listed above), various types of particles from different sources can collect in HVAC (Heating, Ventilation and Air Conditioning) ducts and other parts of the system (coils, etc.). Generally, the amount of these particles that might re-enter the home [through air circulation] is small. There are some studies suggesting little to no benefit from duct cleaning under these everyday scenarios. In fact, there are some studies that show dramatic increases in particle levels in the home during and immediately after duct cleaning **when it is done improperly**. Yet other studies show people have a **perception of significant improvement** in the environment with an improved ability to concentrate and reduced nasal symptoms after duct cleaning. So, **evidence about the benefit of duct cleaning** under everyday circumstances **remains mixed**.” (For more information on the benefits of duct cleaning, check the U.S. Environmental Protection Agency (EPA) website www.epa.gov/iaq/pubs/airduct or ask AAFA-TX).

It's difficult to individually improve outdoor air quality. AAFA-TX believes **you can control your home's indoor air quality** by following some simple steps:

- 1) If you can't stop smoking, then **don't smoke indoors**. **Smoking** is a major air pollutant and a major health deterrent. Tobacco smoke – cigarettes, cigars, pipes – contain more than 4000 chemicals, many toxic or cancer-causing. It's unhealthy for the smoker and unhealthier to others as secondhand smoke, especially for those with asthma.
- 2) Check that wood-burning **fireplaces** are properly vented so the smoke is drawn up the chimney and not into the room. Installing a glass hearth screen and cleaning and inspecting your chimney each season will help keep nitrogen dioxide gases and irritating particles from affecting your health.
- 3) Examine **gas stoves & gas water heaters**. They should have working exhaust fans vented to the outside. The burner flame should be blue, not yellow. This gas is odorless but a sour smelling chemical is added so we can detect gas leaks. If you detect this odor, turn off the appliance and call your gas company. The carbon monoxide that is leaking is toxic and can cause headaches, dizziness, nausea, or fatigue – even death.
- 4) High humidity can lead to mold which can make allergy and asthma symptoms worse. **Control humidity** in your home by installing vents in your attic, basement or crawl space. If you have a humidifier or dehumidifier, clean them frequently according to manufacturer's instructions.

5) If you have **pets**, especially cats, then dander on furniture, carpeting and clothing is always a potential problem for people with allergies to dander. If you can't find a new home for your pet or don't want to part with them, restrict their access within the house, especially keeping them out of bedrooms. Bathe and comb your furry pet frequently, too.

6) **Carpeting** presents a whole array of potential health issues. **New carpets release chemicals** from the fibers, adhesives and padding which can cause headaches, sore throat, eye irritation and even fatigue so it's important to ventilate after carpet installation. **Existing carpeting that has water damage can be a breeding nest for mold and bacteria.** It's best to get rid of water damaged carpet and if possible, replace it with tile, wood, or linoleum.

7) **Eliminate as many household cleaning chemicals as possible** and store any necessary chemicals in a separate, well-ventilated place. Open windows or use fans when using these products, especially mildew removing products in bathrooms. Avoid scented room deodorizers, candles and incense too. Use "environmentally safe" products as an alternative to using dangerous chemicals to clean. Use diluted vinegar to clean glass and mirrored surfaces, wash tile floors or freshen drains; use baking soda instead of cleansers or drain cleaners; use 3% hydrogen peroxide instead of bleach to whiten clothes, lift spots and kill mildew. For more information, ask AAFA-TX.

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