Improving Home Indoor Air Quality

There are three general ways of improving air quality in your home: (1) reduce or remove sources of pollution (prevention/source reduction), (2) ventilate properly to get rid of pollution when it is present (ventilation), and (3) remove the pollution from air using a proper control device (air purifier) in your HVAC system or as a stand alone unit (control). Some helpful hints are provided below, but are not intended to be an all inclusive list. For additional information you should visit the websites listed on the back of this sheet.

Prevention / Source Reduction

✓ Do not smoke or allow anyone to smoke in or around your home.

✓ Do not burn incense or candles. Like cigarettes, incense and candles emit small particles that can deposit in the deepest recesses of the lungs where they can do damage.

✓ Do not use unvented fossil-fuel-based space heaters, e.g., kerosene heaters, under any circumstances. These devices release deadly carbon monoxide (amongst other pollutants).

✓ If you have persistent flu-like symptoms, consider the possibility that you suffer from exposure to carbon monoxide in your home. Carbon monoxide can cause headaches and other flu-like symptoms, and is sometimes emitted from faulty gas wall heaters and other combustion appliances. Consider hiring a qualified professional to test for carbon monoxide in your home.

✓ Avoid exposure to formaldehyde. Do not purchase furniture or shelving/cabinetry consisting of pressed-wood products that contain urea-formaldehyde resins. Also, wash permanent press clothing, sheets and other fabrics before using.

✓ Avoid the use of toilet deodorizers, closet air fresheners, or moth repellents that contain the chemical dichlorobenzene.

✓ If possible, do not store gasoline, pesticides, or liquid cleaning products in your home or garage. Attached garages are very much part of the occupied space of the home. Storage in a locked but properly ventilated shed in a yard is best if possible. If this is not possible, consider the installation of a small fan in the garage that vents garage air to the outdoors (negatively pressurize the garage). As with the installation of any new fans, be aware of the possibility of back-drafting from combustion appliances such as gas water heaters that might be located in the garage.

✓ Do not combine uses of chlorinated bleaches or cleaners that contain either ammonia or acidic cleaning agents. Combining these products can lead to the liberation of toxic gases that can lead to severe health effects or even death.

✓ Avoid nursery or other extensive home renovations (new carpet, paint, furniture) during pregnancy or for several years after a child is born.

✓ Avoid having a newborn in the near vicinity of a kitchen when cooking. Natural gas burners can lead to emissions and accumulation of carbon monoxide and nitrogen dioxide in the kitchen and surrounding rooms. Elevated levels of carbon monoxide may induce short-term health effects in newborns (headaches, etc.). Nitrogen dioxide levels in kitchens during the use of gas burners often exceed outdoor regulations several-fold and have been shown to have negative effects on the respiratory system of young children. Whether gas or electric burners are used, cooking can emit additional harmful gases and particles.

✓ Do not allow indoor/outdoor pets to stay in outdoor areas that have recently been sprayed with pesticides. Pets, and especially dogs, can be very effective at carrying pesticides into a home on their paws and fur.

✓ Make sure that your home is not prone to contamination by naturally-occurring radon. Find out from your State health department or other reputable source (see USEPA website at end of this document) whether the area where you live is prone to indoor radon. If so, have the home tested for radon and consider remediation options (positive pressurization or sub-slab ventilation) if radon levels are high. Note that radon is generally not a major indoor air pollution problem in most of Texas.

Ventilation

✓ Ventilate your home properly by opening windows when painting, wallpapering, applying floor stains, and other highly volatile products.

✓ Make sure that you switch on a bathroom fan or open a window in the bathroom while showering/bathing or using any chemicals to clean in the bathroom.

✓ Use a properly vented stove hood when cooking on burners (even with electric burners). Note that many hood vents simply circulate air through a grease trap back into the kitchen. Find out whether your hood vent actually vents to the outside, and if not consider a retrofit to do so.

✓ Chlorine-containing laundry bleaches and dishwasher detergents contain chlorine that chemically reacts with soiled clothing or foodstuff on dishes and leads to large amounts of chloroform that is released to indoor air. Consider opening a window or vent fan in your laundry room if you use chlorine bleach while doing your laundry. Consider switching on a stove vent in your kitchen while you do your dishwashing. Each will help to direct the chloroform outdoors and reduce its accumulation in the air of your home.

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Control of Indoor Air Pollution

✓ Consider only portable air cleaners with high CADR (clean air delivery rate). A CADR of greater than 200 CFM (cubic feet per minute) is desirable for the removal of particles from the air in a medium-sized bedroom. These types of air cleaners often contain HEPA filters for the removal of small particles in air. They sometimes also contain activated carbon for the removal of gases such as volatile organic compounds (VOCs).

✓ Do not use any “air purifiers” that emit ozone into your home. These include ozone generators (often marketed as releasing activated or tri-atomic oxygen) and many ion generators. Ozone itself is a harmful air pollutant, but also generates irritating and sometimes toxic by-products when it reacts with chemicals in fragranced products and many indoor surfaces.

✓ Whole-house control systems cannot compete with a dedicated HEPA air cleaner in a single room. The dedicated air cleaner works 100% of the time - not just when the HVAC system is running.

✓ Use a medium to high efficiency filter (MERV 8-11) in your heating/air-conditioning system, and change it every three months. A MERV 11 filter will capture 90% of allergen particles in the air and will not generally have a negative effect on air flow.

✓ Make sure that your filter fits tightly and that there is no bypass around the edges. Bypass of air can severely reduce the effectiveness of an air filter.

✓ Vacuum regularly, but use a vacuum cleaner with a HEPA filter and assure that those with dust allergies are not present during a vacuuming event or for several hours thereafter. Vacuum cleaning leads to re-suspension of particles into air, many of which contain allergens.

✓ Use a damp rag to dust in order to capture the dust immediately as opposed to simply distributing it elsewhere in your home.

✓ Use floor mats at all entries to clean shoes, or better yet have family members and guests take their shoes off before entering your home. Shoes are a primary means of tracking harmful chemicals such as pesticides, other heavy organic chemicals, and heavy metals into homes.

✓ Humidity is a major issue in Austin. Consider purchasing a hygrometer and make sure the humidity in your home stays below 50%. This helps to reduce mold and dust mites - two of the major allergens in Austin.

✓ If members of your family are allergic to dust mites, encase their mattresses and pillows in dust mite proof encasements. The vast majority of people with allergies in Austin are allergic to dust mite proteins (feces). Dust mite allergen is heavy and airborne for only a few seconds. It is most commonly found in mattresses, pillows, carpeting and upholstered furniture. The major exposure is at night. In most cases the biggest bang for the buck for allergic people is to encase their mattresses and pillows and wash all bedding in hot water.

✓ Contact your utility provider about duct sealing programs to save energy and improve your indoor air quality.

Education and Personal Action

Become more educated on these and other issues relevant to indoor air quality, and take action to protect the indoor air quality of your own home. The following websites contain good information on indoor air pollutants and their sources.

- US Environmental Protection Agency
  [http://www.epa.gov/iaq/index.html](http://www.epa.gov/iaq/index.html)

- California Air Resources Board
  [http://www.arb.ca.gov/research/indoor/INDOOR.HTM](http://www.arb.ca.gov/research/indoor/INDOOR.HTM)

- American Lung Association

IGERT: Indoor Environmental Science & Engineering

The University of Texas

[www.caee.utexas.edu/igert](http://www.caee.utexas.edu/igert)

At the University of Texas we have one of the largest graduate programs in indoor environmental science and engineering in the world. Our program is funded by the National Science Foundation through its Integrative Graduate Education and Research Traineeship (IGERT) program. We are an interdisciplinary community of Ph.D. students and faculty who study a wide range of important indoor environmental quality problems, and who engage in outreach to help educate the public about indoor environmental quality problems and solutions. We work within the goal of development and improvement of healthy and sustainable buildings. Please visit us at the website provided above.

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