

OPTIMAL HEALTH UNIVERSITY™

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Reducing VOCs in Your Home

A report by the World Health Organization blames indoor air pollution for 2.7 percent of all disease. Products you use in your home can pollute the air with a variety of potentially harmful volatile organic compounds — or VOCs. Your home's air may harbor up to five times as many VOCs as the air outside, according to the Environmental Protection Agency.



Your doctor at Duluth MultiCare is concerned about the effects of VOCs on your well-being and offers the following tips to help you protect your family's health.

Know the Risks

Volatile organic compounds are chemical compounds that vaporize easily into the air. While some VOCs come from natural sources — such as forest fires and wetlands — others are released by manufactured products commonly found in the home. One study estimates that 1,000 different VOCs are present in indoor air (*Kokuritsu Iyakuhin* 2002;120:36-8). Familiar sources of VOCs in the home include cleaners, air fresheners, solvents, paints, adhesives, wood preservatives, dry cleaned clothing, pesticides and fuels.

Potential short-term health effects of VOC exposure include eye and upper respiratory irritation, nausea, headaches, shortness of breath and nose-bleed. Research has also linked VOC exposure to a wide range of health problems, such as damage to the liver, kidneys and central nervous system.



VOCs have also been linked with cancer in animal tests (*Nippon Eiseigaku Zasshi* 2009;64:683-8, *Environ Int* 2009;35:1136-41). Exposure in utero has been shown to damage the immune and respiratory systems of newborns (*Rev Mal Respir* 2008;25:475).

The good news is that it is relatively simple to significantly reduce in-home exposure to VOCs. Following are several suggestions from your doctor at Duluth MultiCare to diminish levels in your living space.

Keep Your Home Well-Ventilated

The main reason air pollutants are so concentrated indoors is that they often have nowhere to go. Newer homes in particular tend to be airtight, trapping VOCs inside. Research indicates that houses with poor ventilation boost occupants' risks of cancer (*Environ Health Perspect* 2009;117:1925-31).

Increasing your home's ventilation will cut down on VOC exposure. As often as weather permits, open multiple windows to let your home "air out." Also, be sure that your HVAC system is appropriate for your home's size — an underpowered system will not circulate enough fresh air to keep VOC levels at a minimum. Use high quality air filters and change them at least once a quarter. In addition, be sure that gas or oil-burning appliances such as dryers, furnaces and water

heaters properly vent to the outside.

Clear the Air With Plants

Plants are nature's air purifiers, and they can perform their work in your home as well. Numerous houseplants show superior ability to reduce VOC levels, removing as much as 80 percent of VOCs in four hours (*Hort Science* 2009;44:1377-81; *J Amer Soc Hort Sci* 2008;133:521-6). Some of the best air-cleaners include ficus, English ivy, Boston ferns, peace lilies, spider plants and chrysanthemums.

However, it is essential that you choose your houseplants carefully — pesticide residue and plastic pots also produce VOCs (*Hort Science* 2009; 44:396-400). For the cleanest air, your doctor at Duluth MultiCare recommends that you choose organically grown plants when possible, repot them in clay pots, and avoid treating them with chemical pesticides and fertilizers.

Try Natural Cleaners

If the lengthy health warnings on the bottle don't make it clear, the potent fumes will — conventional cleaners are full of VOCs that irritate the respiratory system and can lead to chronic conditions such as asthma (*Environ Health* 2009;8:11). Those containing chlorine bleach are particularly noxious, filling the air you breathe with chemicals like chloroform and carbon tetrachloride, a probable carcinogen (*Environ Sci Technol* 2008;42:1445).

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More and more “green” cleaning products are easily found on the shelves of most grocery stores. However, read labels carefully, as many of these products are promoted with vague or unsubstantiated claims about their safety and eco-friendliness. A better choice might be to make your own cleaning solutions out of safe ingredients such as white vinegar, baking soda and castile soap. Copious recipes can be found in green house-keeping books and online.

Make Green Decorating Choices

Can decorating your home make you sick? A recent study reveals that new homes — with their fresh paint, new carpet and pristine finishes — are rife with VOCs that increase residents’ risk of maladies including headaches, dizziness, nausea, coughing and irritation of the eyes, nose and throat (*Int Arch Occup Environ Health* 2010;83:225-35).

One common culprit is formaldehyde given off by latex paints, carpet, flooring, paneling and pressed wood furniture. Scientists found that formaldehyde is a powerful neurotoxin and is particularly harmful to young children (*Rev Environ Contam Toxicol* 2010;203:105-18).

Whether you are building a new home or redecorating, safer alternatives exist for most of these products. Low-VOC and no-VOC paints are increasingly available for both professionals and do-it-yourselfers. Carpet and flooring options with few or no VOCs also abound. Many are made of natural materials such as cork, bamboo, linoleum and wool. Be sure to look for low- or no-VOC adhesives and finishes for these floors.

For furniture, choose solid wood vs. pressed wood. Pressed wood — also called particleboard or fiberboard — is made of wood fibers and particles bound with an adhesive that often contains formaldehyde.

Beware of Artificial Fragrances

The doctor warns patients that many

of the products we use to make our homes smell “fresh” actually fill our homes with dangerous VOCs. One compound found frequently in deodorizers and air fresheners is 1,4 dichlorobenzene. Exposure to this VOC — which researchers found in the blood of 96 percent of a population sample — may reduce lung function and worsen existing respiratory complications (*Environ Health Perspect* 2006; 114:1210-4).

For a safer alternative, mix a few drops of your favorite pure essential oil with white vinegar in a spray bottle. Or, place baking soda in areas that need freshening.

Candles are another common VOC culprit. A study presented last August at the National Meeting of the American Chemical Society in Washington, DC, examined the VOCs released by burning paraffin candles. These include toluene, which may impair kidney function and benzene, a known human carcinogen also present in cigarette smoke. Beeswax and soy candles, on the other hand, appear to be safe. Look for wicks without a metal core, as the burning metal may produce pollutants.

Control Pests Safely

Ants or cockroaches may bug you, but the VOCs in commercial pesticides can bug your respiratory system even more. They typically contain chemicals called organophosphates and pyrethroids. Scientists have linked regular exposure to these compounds with asthma and chronic bronchitis (*Nippon Eiseigaku Zasshi* 2009;64:672-82).

The most natural solution to pest problems is prevention. Keep your home free of crumbs and open food packages. And be sure garbage containers seal tightly. If you already have an infestation, borax and diatomaceous earth are two all-purpose solutions that are safe for your home’s air (but should be kept away from pets and small children). Essential oils and herbs may also scare away unwanted guests.

Dry Clean With Caution

The distinct odor of dry cleaned clothing comes from perchloroethylene — or “perc” — the solvent most commonly used in dry cleaning. When you bring home clothing from the dry cleaner, it continues to release perc. This VOC has been shown to cause leukemia and liver cancer in animal tests (*Regul Toxicol Pharmacol* 2006; 45:178-84; *Toxicology* 2009;260:77).

New nontoxic advances in garment care include professional “wet cleaning”, which uses water instead of a solvent and cleaning with liquid CO₂. If you must use a dry cleaning service that employs perc, air out your clean clothing outdoors before bringing it into your home.

“Off Gas” Plastics

Newly manufactured plastic products, such as some toys, strollers, shower curtains and tarps, may also release dangerous levels of VOCs into your home. It’s a good idea to “off gas” these items outside, especially if they are giving off a strong odor when first unwrapped.



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