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Air Pollution

by Raymond Francis

The average American breathes in about two heaping tablespoons of airborne particles each day. The smallest of these particles can lodge deep in the lungs where they remain and cause serious problems. Now there are shocking new findings regarding such particles. In mid-May, Canadian researchers reported in the journal *Science* that fine airborne particles can cause genetic mutations that are passed on to future generations. Most of these fine particles emanate from industrial plants, power plants, incinerators, and diesel-burning vehicles.

In 1999, a study in Los Angeles indicated that 71 percent of the cancer risk from air contaminants came from diesel emissions; now we know why. The fine particles from these emissions cause DNA damage, and such damage is the first step in the development of cancer. The researchers said they didn't know if it was the particles themselves or toxic chemicals carried by the particles that were causing the damage. The only good news coming out of this report is that using a HEPA (High Efficiency Particulate Air) filter to clean the air prevents the damage.

Air pollution has been long recognized as a cause of disease. It causes ailments from allergies to cancer, and inhaling particles is known to disrupt the heart's beat-to-beat variations. It is estimated that 64,000 Americans die prematurely each year from heart and lung disease caused by particulate pollution. However, you don't have to live downwind of a power plant or drive behind a truck to be poisoned by air pollution. Some of the most polluted air you can breathe is found right in your own home. Most people are aware that driving in traffic puts a toxic chemical load on the body. However, most are unaware that our biggest pollution load can be found in our homes and offices.

Not only does polluted outside air, with all its particles and chemicals, get into our homes, but then we add to the pollution once inside. Sources of toxic chemicals such as building materials, furnishings, gas appliances, furnaces, cleaning and consumer products, and tobacco smoke all contribute to an unhealthy indoor environment. Data from the Environmental Protection Agency indicate unprecedented amounts of indoor air pollution. Most indoor air is two to five times more polluted than outdoors, but it can easily reach a hundred times more polluted. The combination of indoor pollution and the fact that most Americans spend 90 percent of their time indoors creates a serious health problem, a challenge that must be addressed.

Where is this indoor pollution coming from, and what can be done about it? One important source is the building materials themselves. Plywood, particleboard, and paints off-gas formaldehyde, a common indoor pollutant and carcinogen. Formaldehyde causes serious damage to DNA, and the damage is accumulative as exposure continues. Most especially, do not live in a house or buy furniture made of particleboard, as it off gasses the most.

Another important source of indoor pollution is carpets. Carpets made of synthetic fibers will off-gas dozens of toxic chemicals, some of them for decades. New carpets are especially toxic. Chemicals come not only from the fibers, but from the adhesives, backing, and padding. Consider using carpets made of natural fiber or hardwood floors with area rugs.

Dangerous gasses and particles are generated by household appliances such as gas stoves, water heaters, furnaces, space heaters, and fireplaces. These can release toxins such as nitrogen dioxide, carbon monoxide, methane, and other gasses along with fine particles into the indoor air. Furnaces and gas water heaters should be kept outside the living space, such as in a shed or unattached garage. If this is not possible, consider switching to an electric water heater; this is what I had to do. Gas stoves should be used only with good ventilation, an electric stove is preferable. Use fireplaces sparingly and never use artificial logs as they put a heavy hydrocarbon load into the living space.

Even tap water is dangerous. Tap water contains toxins such as chlorine and chlorinated hydrocarbons. Exposure by breathing these chemicals can rival or exceed exposure from drinking the water. Particularly bad is breathing the fumes from dishwashers, clothes washers, bathtubs, and showers. Bleaches and detergents used in washing add to the toxic load. Good ventilation is essential, as is using a water filter for drinking and showering.

Paradichlorobenzene, found in mothballs and deodorizers, is another common indoor pollutant and also a carcinogen. Cedar chips are a more benign alternative to mothballs.

Attached garages are another problem. Exhaust fumes as well as hydrocarbon vapors coming from the engine can enter the living space. Whenever possible, I leave my garage door open so as to ventilate that space.

Never use pesticides in or around the home. If such is necessary, use a safe Beyond Health approved pesticide. Tobacco smoke, perfume, cosmetics, cleaning products, aerosol products, and all manner of scented products are toxic and should be avoided. There are safe alternatives for most things. Beyond Health even has a safe and extraordinarily effective carpet-cleaning product. Other biological contaminants include mold, animal dander, dust mites, and cockroaches.

The negative health effects of air pollution may be felt immediately, years later, or as has now been discovered, even in the next generation. Immediate effects can be felt after a single exposure, but most effects are more insidious, causing damage to health without your knowing it. Even colds, flu, and asthma can result from the damage to immunity caused by breathing polluted air.

Numerous studies have proven that breathing clean air is healthier. Every American needs to reduce their toxic load, and to be aware of the health risks posed by air pollution. To protect ourselves, we must begin with our personal environment and stop introducing pollutants. Be aware of the problems with carpets, paints, cleaning materials, deodorizers, mattresses, gas appliances, perfume, dry cleaning chemicals, and so forth.

After reducing the amount of new pollutants we introduce into our environments, we need to reduce the existing toxic load. Toward this end, filters are what we need: shower, water, and air filters. Even in the above study of genetic damage caused by fine particles, the damage was prevented by filtering the air with a HEPA filter. Due to the unprecedented levels of air pollution we are now exposed to, air filters have become a virtual necessity.

Two years ago, I set out to find an air filter suitable for homes and offices that would meet my exacting standards for quality, safety, and effectiveness—a filter I could recommend to the public. The first units I looked at were the heavily-advertised “ionic” air filters. I rejected these devices. The February 2002 *Consumer Reports* rated them at the bottom for removing air particles and they do not remove chemicals. Worse, they are ozone generators. Ionic air filters are capable of generating worrisome levels of ozone that have actually been measured to exceed safety standards. This is especially bad if you sleep in a small bedroom with the door closed.

Ozone is a powerful oxidizing agent that will deplete the body’s stores of precious antioxidants, such as vitamins C and E. Even low levels of ozone can irritate the nose and airways, increasing the symptoms of allergies and asthma. Low-level exposures to ozone have been shown to cause significant temporary decreases in lung capacity, and people with lung disease or asthma would be particularly at risk. Population studies on humans showed that long-term exposures to low-level ozone can lead to permanent reduction in lung capacity. Humans exposed to 0.5 ppm for three hours a day, six days a week, for twelve weeks showed significant changes in lung function. Animals exposed to 1 ppm for just two days suffered lung damage.

The U.S. National Ambient Air Quality Standard is an hourly average of 0.12 ppm (parts per million). I think this standard is too high. My rule of thumb is this: if you can smell it, it’s too much. The odor of ozone becomes obvious at about 0.05 ppm. Short-term exposures to little more than this can cause increased sensitivity to airborne allergens and irritants. In one study, increased bronchial response was measured following seven hours of exposure to just 0.08 ppm of ozone, and the effects lasted for 18 hours. Given that the effects at 0.08 ppm are not far above the 0.05 ppm detection threshold, one could easily be exposed to these amounts without being aware. To make matters worse, you can’t always trust odor as a reliable indicator. Ozone will initially produce a sharp odor, but after a brief period of exposure, it dulls the sense of smell. Ozone concentrations could increase and you would not be able to detect it.

Ozone toxicity is bad enough, but ozone can react with other pollutants in household air to create even more harmful chemicals. For example, in May 2004, researchers at the U.S. Environmental Protection Agency warned that ozone can react with the chemicals in the air fresheners people often use in their kitchens and bathrooms, producing unhealthy levels of formaldehyde-related compounds. It is a bad idea to pollute the air in your home with these toxic air fresheners in the first place, but when these chemicals react with ozone, it becomes even more toxic.

Indoor air pollution is a serious health problem, and I highly recommend filtering. After carefully researching available filters, I have selected an air filter that earns the Beyond Health seal of approval. It is designed and built to superior standards, and offers the highest levels of protection and reliability. These units are quiet, economical, and safe for continuous operation. They filter both chemicals and particles, and the HEPA filter media is good for up to five years without

replacement (other designs require frequent filter replacement). To obtain a “best buy” Beyond Health approved air filter for your home or office, call 800-250-3063.

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