

## How to Guard Against Invisible Enemies at Home

Children have a lower toxic threshold than adults. So they're the first to issue an early warning sign that something's wrong in the home, daycare, school or neighborhood environment. Many families are first prompted to create a healthier home while trying to pinpoint and eliminate a childhood allergy, sleepless nights or some chronic illness. Knowing something about the invisible pollutants at work inside and outside living spaces can go a long way in ridding a family of these common invisible enemies.

### THE AIR WE BREATHE

**Problem:** Connecticut is daily plagued with thousands of tons of chemical-laden particle air pollutants. We call it soot. It originates in diesel truck exhaust, coal-fired power plant stacks and incinerators. Soot is behind much of the asthma and lead and mercury poisoning reported in our area.

**Solution:** A good way to protect our children and ourselves from particulate pollution is to use home air filters that meet the Occupational Health and Safety Administration's HEPA standards for delivery of "High Efficiency Particulate Air." These remove chemical and mercury-laden particles, pollen and airborne pesticides before they enter a building. They also alleviate unhealthy intruders like dust, pet allergens and some mold spores.

Many good quality HEPA filters are available. One with ionization is recommended, which adds good negative ions to the air. These ions aid the lungs in absorbing oxygen. Tiny air sacks in the lungs called alveoli have a positive charge, so they naturally attract and absorb their opposite, negatively charged healthy oxygen air ions. It makes breathing easier.

### GOOD NATURAL LIGHT

**Problem:** It's no mystery why gray days depress us. We hunger for natural daylight.

**Solution:** Nothing beats day lighting to create a cheerful space for children. Skylights and light tubes can bring light into even dark interiors. When that's not possible, the best all around artificial light for children's play areas are multiple ceiling-mounted, full spectrum fluorescent lamps. It can make them feel as if they've been out in the early morning on a summer day.

### PESTICIDES ARE TOUGH ON BUGS AND HUMANS

**Problem:** Comparing results of industry reports against academic tests for many of the same products in the pesticide category is an eye opener. Pesticides are far more dangerous than we suspect. More of them should be banned from the shelves by the Environmental Protection Agency. Repeated or any use of pesticides inside or outside the house can affect the family's health. Traditional termiticides, for example, often show up in well water and are known to contribute to frog and fish kills from runoff into streams. Such chemicals applied outside the house can also enter as a toxic gas creeping through cracks in basement walls. This is the same way radon enters, in the form of radioactive gas.

**Solution:** We have access to many safe products on the market today that are toxic only to bugs. Household bugs will die from generic borax powder dusted behind counters and in crevices where they hide. On new construction, products made from plain old safe borax called Borate and Timbor, sprayed on raw wood surfaces, renders the material toxic to bugs like termites and carpenter ants while providing fire resistance. For termites, a sealed ground bait and switch system like Sentricon is recommended.

### GET THE LEAD OUT

**Problem:** Lead is a highly toxic metal proven to be neurologically destructive. Lead was banned in 1978 after accumulating evidence showed that lead in flaking paint was turning up in children's bloodstreams. Paint flaking off of windowsills is mouth-high to a teething child. This deadly substance is often found in the soil surrounding a house where debris has dropped from past scrapings of old house paint.

**Solution:** Buy a post-1978 residence, or stay put but replace the toxic soil outside, and change out windows and sills. You can also encapsulate old wall paint with an approved bonding paint material.

### MOLD TAKES HOLD

**Problem:** Mold needs two ingredients to grow, life-giving moisture and a cellulose material to eat, like drywall backing, paper or wood. Water leaks are a common entry point where mold takes hold. More frequently it comes from warm air, which contains more water than cool air.

When warm humid air cools or comes in contact with a cool surface, it can't hold its water, reaches a lower temperature called its "dew point," and drops it. This happens every evening when the air cools and drops dew on the grass. Such condensation on a mold food source provides a perfect incubator. As mold grows, it shoots off microscopic particles called spores. We breathe them into our lungs and they enter our bloodstream, causing illness.

Basement dwellings as well as homes and offices built on a ground-level slab have a greater chance of developing mold. These pesky fungi also like to form in places with little air circulation, such as under and behind beds and in closets.

**Solution:** The best overall remedy is use of humidifiers or air conditioning. This equipment removes humidity and dries the air, so that it can't reach its dew point on cool surfaces. Louvered doors on closets also help with circulation. In summer it's wise to create airspace between walls and furniture.

*Children have a lower toxic threshold than adults. A fetus is exceptionally vulnerable to whatever a mother exposes herself to during pregnancy.*

If mechanical air-cooling equipment isn't available or affordable, mold problems also can be alleviated through passive cooling. Keep warm moist summer air out of the house during the day simply by closing windows. The slab and other materials will absorb heat from the air inside through the day, holding down humidity and helping to keep the family more comfortable. Open the windows after twilight to let cooler dryer air into the house and cool down the floor slab and other materials through the night.

Moist air prevalent in kitchen and bathrooms can be defused through exhaust fans. These are recommended even for rooms with windows. Remodeling with plastic air barriers in bathrooms prevents the moist air inside from reaching its dew point. All of these measures work to protect the integrity of the walls and décor.

### TO CARPET OR NOT TO CARPET

**Problem:** Carpet is an open invitation to dirt, dust, mites, bacteria and other childhood allergens as well as mold that can form when carpet rests on a

ground floor concrete slab. Carpets are also prime sources of noxious chemicals in their dyes and backing.

**Solution:** Don't carpet. Or at least choose carpets and pads verified as having Low Volatile Organic Compounds (VOCs). Letting new carpet sit in a warm garage with open windows can out-gas some of the VOCs. Sweep with a HEPA-rated vacuum cleaner regularly. Wash throw rugs as needed. Hardwoods or sustainable fast growing cork and bamboo are beautiful and foot-warm choices for healthful floor finishes.

### MIGHTY LITTLE DUST MITES

**Problem:** Microscopic insects live by the millions in our bedding and wherever we rest our bodies. Their skin casings and pellet wastes are the primary indoor source of asthma, itch and stuffiness allergy symptoms. Mites typically cannot survive in less than 50 percent humidity, as they need to take water from the air. But dust mites also suck moisture from human perspiration and feed on the skin flakes we constantly shed.

**Solution:** Do not try to control dust mites by laying down chemicals or spraying bedding with pesticides. The best solution is to cover the mattress, comforter and pillows with dust mite covers. This seals them from the sheets and washable covers, which can be regularly laundered in hot water.

### DANGEROUS GAS LEAKS

**Problem:** Furnaces, water heaters, kitchen ranges and garaged cars all can create deadly carbon monoxide (CO) gas. For example, when a range exhaust fan is turned on, it can create sufficient suction throughout the house to pull exhaust gas back down a water heater or furnace chimney, flooding the house with CO. Fireplaces will emit CO gas and particle pollutants, even when covered with a glass or metal door. Exposure to this odorless gas first usually shows up in chronic flu-like symptoms.

**Solution:** Have a home inspector check the entire house with a gas

detector. When operating a range exhaust fan, reduce the velocity or open a window. Always keep a window ajar while using a fireplace. Better yet, have a mason cut a permanent vent with a damper to connect the inside of the chimney with an outside air source.

### SLEEPING IN ELECTRIC FIELDS

**Problem:** Sleeping closer than three feet to common household appliances makes the body an antenna for nearby electrical wiring. It attracts a flow of electrons through the air that can deliver up to 50 millivolts in body voltage. Knowing that a pacemaker can keep a heartbeat regularized with just 1 millivolt pulses, imagine what 20 to 50 millivolts can do. One known effect is that the brain's pineal gland reads this electricity as if it were sunlight and interrupts the production of melatonin, resulting in a feeling of exhaustion even after hours of sleep.

**Solution:** Move the bed or couch, or eliminate wiring and electronics like clock radios and CD players anywhere within three feet of the bed. Also cover wiring in the wall behind the bed with aluminum foil to shield the electrical field. For new construction, simply install common foil-covered wiring.

Looking at the home as a partner in healthy family living and understanding its common technological foibles, supplies the motivation to whip it into shape. It will take time, some money and a bit of research. But a healthy house will feel as good as it looks.

Source: *Architect Darek Shapiro is principle of Environmental Architecture, a full-service design firm in Stamford, CT established in 1983. He counsels on building designs that improve inhabitants' health and productivity and actively promotes green building and clean energy generation. He's also a certified Bau-biologist and environmental inspector. For information or to attend a scheduled presentation visit [www.envarch.com](http://www.envarch.com). Shapiro may be reached at 203-329-9775 or [info@envarch.com](mailto:info@envarch.com).*

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