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! 5 SURPRISING
WAYS YOUR
BODY IS UNDER
ATTACK—
AND HOW TO
FIGHT BACK.

toxic
shockers



BY *Alexa Joy Sherman* ILLUSTRATION BY *Gary Taxali*

It's no secret that we're living in an increasingly toxic world—and researchers are learning more every day about what they refer to as our toxic “body burden” or “pollution in people.” For instance, bisphenol A (BPA), a petroleum-derived compound that mimics estrogen in the body and is most commonly found in a wide range of plastics, has been associated with increased risks for cardiovascular disease, miscarriages, breast and prostate cancer, reproductive and metabolic dysfunction, diabetes, and neurological and behavioral disorders. Meanwhile, phthalates—found in products including toys, personal care items, pharmaceuticals and cleaning supplies—have been linked to breast and liver cancers and the disruption of male and female reproductive systems.

Although companies and policymakers are working to better regulate or even eradicate such toxins in consumer products, the dangers continue to lurk in a shocking number of places. “People are exposed to several hundred chemicals that we know of on a regular basis and studies show that many of them have adverse health effects in people,” says Ted Schettler, M.D., M.P.H., California-based science director for the Science and Environmental Health Network (sehn.org). Scary as that sounds, there's a lot you can do to lower your own body burden. In fact, a study published in 2011 in the journal *Environmental Health Perspectives* found that when test subjects consumed a fresh diet devoid of canned or packaged foods for just three days, the BPA levels in their blood dropped by 66 percent and their phthalate metabolites by up to 56 percent. “You can never fully eliminate your exposures to hazardous chemicals, but you can certainly minimize them,” says Jane Houlihan, senior vice president of research for the Environmental Working Group (EWG) in Washington, D.C. To do that, you need to know where the toxins are hiding and what you can do about them—which is precisely why we put together this guide.

CARS

You know that many automobiles are bad for the environment, but they can be just as hazardous to your health when you're sitting inside of them—and the stronger that “new car smell,” the worse off you could be. According to research from the Ann Arbor, Mich.-based Ecology Center, the average American spends more than 1½ hours in a car daily, breathing in chemicals including hazardous flame retardants, plasticizers, lead and heavy metals that off-gas from such interior parts as the armrests, dashboard, seats and steering wheel. The health problems that have been associated with these chemicals include allergies, birth

defects, impaired learning, liver toxicity and cancer. “Since these chemicals are not regulated, consumers have no way of knowing the dangers they face,” says Jeff Gearhart, the Ecology Center's research director. The good news is that many automobile manufacturers are taking steps to make their interiors safer; 17 percent of new vehicles now have interiors free of polyvinyl chloride (PVC) and 60 percent are produced without brominated flame retardants, according to the Ecology Center.

Smart solutions Vacuum the interior of your vehicle regularly to reduce toxic dust, and open windows and/or doors for five minutes before getting into your vehicle, Gearhart advises. Then, while driving, keep windows closed to prevent exposure to engine and roadway pollutants and crank the A/C (sans outside air intake). “Using recirculation ventilation settings can reduce levels of interior chemicals by up to 2½ times,” Gearhart explains. “Higher fan settings reduce levels more quickly.” There's another reason to keep your car interior cool, too: “High levels of ultraviolet rays and heat can cause chemicals to break down into more hazardous chemicals,” Gearhart says. So park in shaded areas or garages whenever possible and use sunscreens to help deflect the rays and reduce interior temps. If you're in the market for a new car, check out the Ecology Center's consumer guide to toxic chemicals in cars at healthystuff.org. Topping the list of safest picks in 2012: The Honda Civic, Toyota Prius and Honda CR-Z.

FOOD PACKAGING

Of course plastic containers, as well as food and drink cans with resin linings, should be avoided to minimize exposure to BPA and phthalates in particular. But less obvious sources of chemicals are also found in grease-resistant coatings used in products including many fast food containers, microwave popcorn bags and even pet food bags. These can leach



STUDY CHEMISTRY

Read the ingredients lists on products and learn about the many chemicals and places they're lurking by visiting sites like the U.S. National Library of Medicine's Tox Town (toxtown.nlm.nih.gov). You can also look up products on sites including healthystuff.org and ewg.org.

harmful perfluorochemicals (PFCs)—which have been linked to smaller birth weight and size in newborn babies, elevated cholesterol, abnormal thyroid hormone levels, liver inflammation and weaker immune defense against disease—into food. Research has also found high levels of phthalates in delivery pizza boxes made from recycled cardboard. Meanwhile, a study in the October 2011 issue of *The Journal of Steroid Biochemistry and Molecular Biology* found not just BPA and phthalates,

researchers ARE LEARNING
MORE ABOUT WHAT THEY
CALL “POLLUTION IN PEOPLE.”



fresh foods ARE USUALLY BETTER THAN PACKAGED ONES FOR AVERTING CHEMICALS.

but also endocrine-disrupting organotins and the carcinogen benzophenone among the many toxic chemicals that can migrate from packaging into food. "Printing inks, adhesives, recycled cardboard and plastic containers all can introduce unwanted chemicals into a single food product," notes study author Jane Muncke, Ph.D., an environmental toxicologist in Cham, Switzerland, who adds that chemicals may degrade over time or form new compounds that migrate into food, which are challenging or even impossible to regulate or measure.

Smart solutions Fresh, whole foods are almost always better than packaged ones for averting chemicals and simply ensuring a healthier diet in general. To really cut down on toxic food packaging, stock up on items from bulk bins, which is also better for your budget and the environment (see "Get in with the bin crowd," pg. 16). Glass, ceramic, stoneware, aluminum and stainless steel containers are all safer storage options than plastic, according to the National Resources Defense Council (NRDC), headquartered in New York City. When purchasing cling-wrapped food from the supermarket or deli, the NRDC suggests slicing off a thin layer where the food came into contact with the plastic and storing the rest in a glass or ceramic container.

} FURNITURE

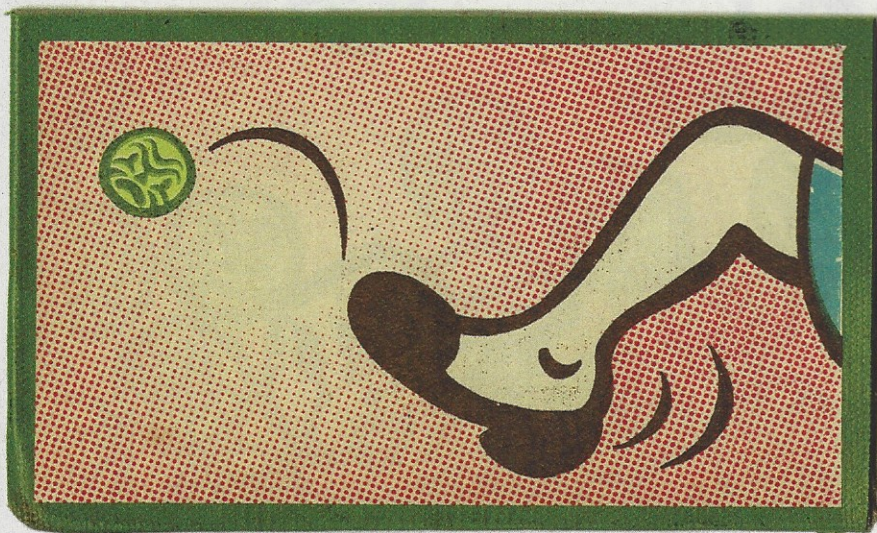
Being a couch potato is dangerous in more ways than one: Polybrominated diphenylethers (PBDEs) are a class of toxic chemicals used to make a wide range of common household products, including foam-padded furniture, computers, television screens and carpet padding, flame-resistant. EWG studies have found these chemicals in the dust of every home and in the body of every participant

tested, with levels in babies and toddlers three times higher than that of their mothers. "Children often have higher exposure levels than adults because they're frequently putting their hands in their mouths," notes Schettler.

Because of health concerns including brain and nerve damage, two forms of PBDEs known as penta and octa are no longer made in the United States. However, these chemicals are still found in furniture and foam items manufactured before a 2005 phase-out. And although several U.S. states and major manufacturers have agreed to eliminate various flame retardants in their products, they continue to be widely used and largely unregulated. "There's also an issue with furniture made out of pressed board or particle board, which is often held together with formaldehyde-based glue," Schettler notes. "This can be an important source of formaldehyde releases, which are known to be carcinogenic as well as irritating to the respiratory tract, among other things."

Smart solutions Your best bet is to use furniture with lower levels of PBDEs and, because dust inhalation is an important source of exposure, clean your home as often as possible, says Schettler. "Vacuums with HEPA filters are best because they don't just re-discharge airborne chemicals back into the environment," Schettler notes. The latest studies from former NASA research scientist Bill Wolverton, Ph.D., author of *Plants: Why You Can't Live Without Them* (Roli Books), show that the lady palm, rubber plant, peace lily, English ivy and golden pothos are among the best plants for removal of common household toxins. Wolverton recommends one or two medium-size (2- to 3-foot) plants per 100 square feet of floor space to help clean the air in an average home or office.

Because the chemicals that are being used in place of PBDEs in foam have not been fully tested for their health effects, seek out furniture made from less flammable materials like leather, wool or cotton—replacing older pieces in your home that contain synthetic foam if you can afford to do so. ("Although older pieces may have off-gassed chemicals over time, materials like foam may have deteriorated, which means the flame retardants or other components will get into the indoor environment," Schettler notes.) Just know that newer products also may be treated with toxic flame retardants, so find out which ones, if any, were used before purchase. If you can't afford to replace items, cover older furniture with sturdy cloth and vacuum and/or wet mop around them frequently.



RECEIPTS

You probably didn't count on this hidden cost on your shopping bill: In July 2010, laboratory tests commissioned by the EWG found high levels of BPA on 40 percent of thermal paper receipts (the kind that change color when you scratch them) sampled from major U.S. businesses and services. In some cases, the amount of BPA measured was as much as 1,000 times greater than that found in common sources of BPA, such as canned foods and infant formula. Although most research has focused on BPA levels from ingested sources, a study published in July 2011 found that BPA transfers readily from receipts and can penetrate the skin to such a depth that it can't be washed off.

Obviously this poses problems for shoppers, but it's even more of a risk for the 7.6 million people who work as retail salespeople and cashiers—the occupations with the highest employment, according to the U.S. Department of Labor. "A typical employee running a register could handle hundreds of contaminated receipts in a single day," notes Houlihan.

Smart solutions Fortunately many retailers use receipt paper without BPA, and the EWG has called on the companies whose receipts tested positive for BPA to change to BPA-free receipt paper. Until that happens, be sure to wear gloves if your job requires you to handle thermal paper frequently, only take receipts when you need them (some stores now offer to email them to you) and scrub your hands well after contact with the thermal ones.

TAP WATER

Most people in the U.S. take the safety of their drinking water for granted—potentially to their detriment. In fact, 315 pollutants have been detected in the tap water Americans drink, according to an EWG analysis, and more than half—including many that have been linked to cancer, reproductive and developmental toxicity, and immune system damage—are not subject to health or safety regulations and can legally be present in any amount. The federal government does have health guidelines for others, but even many of those—including known carcinogens like arsenic—have been found in one place or another at levels above the guidelines.

Smart solutions Find out what's in your water by plugging your ZIP code into the search engine at ewg.org/tap-water. Then use the EWG's online water filter guide to get information on which types will best reduce your family's exposure to impurities like chlorine and lead. Schettler also recommends researching drinking water treatment options at the National Sanitation Foundation's website (nsf.org): "The NSF is a certification organization that has plain English discussions of which water filters take care of which contaminants," he notes. "If you know what's in your water, you can pick your filter accordingly." Don't rely on bottled water, which isn't necessarily better, adds the EWG. Instead, save your health—and the environment—by toting your own filtered tap water in a stainless steel, BPA-free Klean Kanteen (kleankanteen.com) or using a Bobble (waterbobble.com), a bottle free of BPA, phthalates and PVC with a built-in carbon filter that cleans your water as you drink it (each filter equates to 300 single-serve bottles).

DETOX YOUR SYSTEM

It's impossible to completely avoid toxins, but there are certain steps you can take to help your body get rid of them. "A variety of supplements and functional foods can help with liver detoxification in particular," says Boston-based naturopath Cathy Wong, N.D., C.N.S., author of *The Inside-Out Diet* (Wiley), who notes that one of the ways that's achieved is with a process called glucuronidation. "Glucuronic acid binds with toxins, such as BPA, phthalates and solvents, in the liver," Wong explains. "The complex is picked up in bile and then eliminated from the body in stool or urine." Wong suggests these foods and supplements for assisting with detoxification:

CALCIUM D-GLUCARATE This chemical, which is similar to the glucaric acid found naturally in the human body and in a variety of fruits and vegetables, helps to remove toxins that mimic estrogen in the body (e.g., BPA), as well as prevent the reabsorption of toxins including solvents, BPA and phthalates, says Wong. **Try:** Source Naturals Calcium D-Glucarate (\$35 for 60 tablets; vitaminshoppe.com).

CHLOROPHYLL The pigment that gives plants their green hue is good for liver detoxification of heavy metals, such as mercury, and pesticides, notes Wong. "Research suggests that chlorophyll may modulate the activity of detoxification enzymes, protect against free radical damage and bind to toxins, promoting their elimination," she says. **Try:** Drinking 2 to 4 ounces of wheatgrass juice several times a week.

CRUCIFEROUS VEGETABLES These are rich in sulfur-containing glucosinolates, which support glucuronidation and glutathione formation, says Wong. "They are also rich in vitamin C and fiber, which help with detoxification," she adds. **Try:** Adding ½ cup of raw broccoli or kale to green smoothies or juices.

FIBER "If you don't have regular bowel movements, chemicals that have been detoxified by the liver and eliminated in the bowels will get reabsorbed into the bloodstream," Wong notes.

Try: Getting 25 to 35 grams of soluble fiber per day, along with plenty of water, suggests Wong, who recommends sources including oatmeal, beans, citrus fruits, pears, plums and carrots, as well as psyllium seeds, chia and ground flaxseeds.

PROBIOTICS When your gut bacteria isn't in balance, the gut releases an enzyme that breaks down glucuronidation complexes in the intestines. "Toxins are then released for reabsorption in blood," says Wong, who notes that getting 10 billion CFUs of probiotics per day can restore the balance of bacteria in your belly. **Try:** Enzymatic Therapy Pearls Elite High Potency Probiotic (\$25 for 30 capsules; vitaminshoppe.com).