

The New Toxic Threats to Women's Health

They're in your bathroom, your kitchen, your fridge—and mounting research hints they could be wreaking havoc on your weight, fertility and immune system. In a must-read report for all women, Melinda Wenner Moyer investigates the impact of everyday chemicals.

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The Dirty Truth
Experts recommend removing shoes inside—so environmental chemicals don't invade your home.

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IF YOU'VE READ the news lately, you've probably stumbled across headlines about the health risks posed by chemicals in your sports bottle, personal-care products or food containers. THE PERILS OF PLASTIC, read one, in *Time*. CANCER FROM THE KITCHEN? asked *The New York Times*, reviewing the hazards of plastic food containers. It's scary stuff—and the temptation, honestly, can be to turn away from the news and move on. So just how concerned should we be?

Very, say 13 prominent experts interviewed by *Glamour*—especially because women may be particularly vulnerable. For one, we often accumulate higher levels of toxins in our body than men do, according to the 2010 President's Cancer Panel. But it's also because of how these substances behave once they're inside our body. Scientists began to pinpoint some of the possible health risks of certain everyday chemicals back in the 1970s and 1980s, and what they found was startling: Many common chemicals may act like hormones or interfere with a woman's own endocrine, or hormonal, system. (This came as no surprise; scientists first developed one chemical, bisphenol A, *Continued on next page* ➔

or BPA, in the 1930s with the hope of using it as a synthetic estrogen drug.)

Why is the disruption of our hormones a problem? Because hormones aren't just responsible for menstrual cycles and fertility; they are the messengers our cells rely on to communicate just about *everything*, explains Tracey Woodruff, Ph.D., director of the University of California, San Francisco, Program on Reproductive Health and the Environment. When you've eaten enough to sustain your body, it's hormones that tell your brain to put down your fork. When one of your eggs has fully matured, it's hormones that make your ovary release it. Muck with such a finely tuned process, and there's bound to be trouble.

Today the suspects researchers are most concerned about read like a page in a chemistry textbook: BPA, phthalates and tributyltin (TBT). They get into our bodies in a variety of ways—from the air we breathe, the products we use and the food we eat. And experts say they can act as dangerous system-jamming signals. "Even when we're exposed to only tiny amounts" of such so-called endocrine disruptors, explains Laura Vandenberg, Ph.D., a biologist at Tufts University in Medford, Massachusetts, "it could throw crucial bodily processes—like our metabolism, fertility and immune system responses—into disarray."

Yet less than one percent of the more than 80,000 chemicals in use in the United States have ever been safety tested. And many of those products have never been approved by the FDA: It simply isn't required that items we handle be tested as thoroughly as, say, medications we ingest. But in one study, the Centers for Disease Control and Prevention found that 93 percent of Americans had BPA in their body. In essence, says Woodruff, "we're performing a national experiment on ourselves while we continue to use these chemicals."

And the results are starting to come in. Recently, the FDA—as well as groups like the Endocrine Society and the National Toxicology Program—has raised concerns about endocrine disruptors. And in March, eight scientific societies representing 40,000 professionals from fields like genetics and reproductive medicine wrote an open letter urging federal regulators to improve their testing of chemicals.

"I've looked at the evidence—highly credible evidence—and there is definitely enough to warrant avoiding these chemicals," says Pamela Peeke, M.D., assistant clinical professor of medicine at the Uni-

versity of Maryland in Baltimore and author of *Body for Life for Women*. "We suspect there are cancer risks and that some chemicals are also associated with fertility problems, as well as obesity." So how can you live more safely in a world where chemicals are everywhere? Find out here.

Are Chemicals Making Us Fat?

Many people say the obesity epidemic could be solved if we just got off our butt to hit the gym and stopped eating so many Big Macs. Diet and exercise do play a huge role in what we weigh, of course, but there's one glitch with this theory: Over the past quarter century, the incidence of obesity has risen most markedly—by a whopping 74 percent—not in adults or children, but in *infants*.

In fact, six-month-olds today are fatter than they were in 1980, despite the fact that birth weights overall have been decreasing—a finding that makes some scientists

wonder whether environmental chemicals could be causing babies to rapidly gain weight after birth. Bruce Blumberg, Ph.D., a biologist at the University of California-Irvine, is so concerned that these chemicals play a significant role in the rise in obesity that he considers them "obesogens." "Not too long ago, no one would've believed there was such a thing as an obesogen and that anything except eating too much could make you fat," he says. But in Blumberg's research, TBT, a common chemical used to make PVC plastic (of the sort found in some shower curtains), caused mice to develop extra fat cells. And when Blumberg exposed pregnant mice to the chemical, their pups grew to be up to 15 percent fatter than mice that hadn't been exposed.

Now, this is *animal* research, and no one knows just how widely humans are exposed to TBT, which hasn't been tested extensively in humans. But last year researchers at the University at Albany in New York found traces of the chemical in every single sample of house dust they analyzed.

BPA and phthalates, chemicals used to make plastic *Continued on page 182* ➔



Risky Plastics
Avoid those with the number 7 on the bottom, experts say.

flexible, may also impact your weight. Boston University research found that teen girls with greater levels of a certain phthalate in their urine were at higher BMIs than those without. Another study found that Americans who were most exposed to both chemicals were more at risk of developing diabetes. As a double whammy, BPA and some pesticides may even disrupt our body's ability to regulate blood sugar and hunger—two key factors in *losing* weight. "For me, there's no doubt common chemicals are playing a role in obesity and related diseases," says Richard Stahlhut, M.D., an environmental health scientist at the University of Rochester in New York. "Some overweight people have been taking a beating for diseases that are not their fault."

The good news, some researchers say, is that we may be able to lose weight not by starving ourselves but by avoiding obesogens. While researching his book *The New American Diet*, journalist Stephen Perrine asked 400 people to cut their obesogen exposure for six weeks. "We had them swap out foods that tended to be high in obesogens, such as canned foods and grain-fed meats, for versions of these foods with lower chemical loads," Perrine says. They were still allowed to eat burgers and pork chops, just ones that were free-range and hormone-free. After six weeks, the subjects had lost, on average, 15 pounds. Filling your plate with (organic) green leafy vegetables like spinach and kale, which are high in folate, also helps, Perrine says: Duke University research suggests that folate could protect against the adverse effects of BPA.

Are Chemicals Making Us Sick?

Experts aren't concerned only about how this chemical soup affects our waistlines—it could also play a role in some of the diseases we fear most, according to research by Ana Soto, M.D., and Carlos Sonnenschein, M.D., biologists at Tufts University School of Medicine in Boston. Back in 1989 they were studying how estrogen affects cell multiplication. In previous experiments, they'd found that breast cells multiplied only in the presence of estrogen. But suddenly, in one experiment, their cells started proliferating without it. "We said, 'Where is the estrogen coming from?' Because we didn't add it," Dr. Soto

Three Chemicals to Know (and How to Avoid Them)

Bisphenol A

Similar in structure to the hormone estrogen, BPA is a building block of many plastics. It's used in food containers and the lining of food cans. More than 90 percent of Americans have traces of it in their body, and human studies have linked it to fertility problems and heart disease. To avoid it, don't microwave food in plastic containers, and choose glass over canned goods.

Phthalates

This family of chemicals, used to make plastics more flexible, is also found in some cosmetics, air fresheners and cleaning products—particularly ones with added fragrance. Research suggests that some phthalates contribute to weight gain and that they may interfere with the male-type hormones (like testosterone) found in both men's and women's bodies. A good bet: Buy fragrance-free.

Tributyltin

Used to preserve boats and as a component of PVC, it can wind up in your home in some shower curtains. Called an obesogen, TBT may turn stem cells into fat cells. Experts suggest buying PVC-free plastics.

recalls. Turns out, an estrogenlike chemical similar to BPA was leaching out of the plastic tubes that were used in their lab.

Since excessive cell multiplication is a hallmark of cancer, Dr. Soto decided to investigate how chemicals that imitate estrogen—like the one in the tubes—might affect our risk of developing cancer. She has since shown, among other things, that mice and rats exposed to BPA in the womb have a higher risk of breast cancer, and other research has linked the presence of BPA to autoimmune disease in animals. "Despite the obvious differences, humans and mice are biologically very similar," says Philip Landrigan, M.D., chairman of the department of preventive medicine at the Mount Sinai School of Medicine in New York City. "And so far, I have yet to see a chemical carcinogen identified in

animals that didn't eventually turn out to cause cancer in humans."

Frightening stuff—and probably not science fiction. Preliminary research has already raised red flags about a connection between BPA and heart disease in humans.

Are Chemicals Making Us Infertile?

When you first hear the word *hormones*, you probably think of your reproductive system—so how do hormonelike chemicals affect that? Patricia Hunt, Ph.D., believes she knows one way, and she owes that knowledge to a mishap involving soap. In 1998, Hunt, then a reproductive biologist at Case Western Reserve University in Cleveland, was studying why, as women age, they are more likely to have babies with chromosomal abnormalities. To do this, she compared egg quality in different groups of mice. "One day, we ran the experiments, and things were fine," recalls Hunt, now at Washington State University in Pullman. "A week later, things were completely bananas." A surprising number of the eggs were abnormal. "We went, 'What the heck is going on?'"

Hunt finally figured it out: A new temp in the lab had used the wrong kind of soap to clean the rodents' cages and hard plastic water bottles. The soap had damaged the plastic, causing it to release BPA and contaminate the animals' water. The BPA, she confirmed in subsequent experiments, was causing chromosomal defects in the mouse eggs. BPA, believes Hunt, who has dedicated much of her career to studying its effects, "is a chemical we're all exposed to, and it just derails the process of making a normal egg." Scientists at the University of California, San Francisco, have had similar findings: Women undergoing in vitro fertilization, their research found, saw their number of eggs that would be fertilized drop by half every time levels of BPA in their blood doubled.

"Many of us who study these chemicals are concerned that they are causing problems in fertility," concludes Robert Greene, M.D., medical director of the Sher Institute for Reproductive Medicine in Sacramento, California, "and that they may also contribute to pregnancy complications." *Continued on next page* ➔

How You Can Stay Safe

So how does this growing body of evidence affect you—a normal young woman not planning to radically change the way she lives? First, remember that despite the emerging research, no one knows yet the precise risks posed by the products we use. “We don’t have the necessary data to make a complete assessment,” says Woodruff. And Elizabeth M. Whelan, M.P.H., president of the nonprofit American Council on Science and Health, argues that small amounts of the chemicals may not affect us. “These so-called endocrine disruptors are in the environment at such low levels compared to naturally occurring [hormones] in our bodies,” she says.

But many experts disagree, and counsel doing what you can to minimize exposure to these chemicals. “I know that I am likely to be exposed if I drink from a hard plastic bottle,” says Vandenberg. “I’m almost definitely exposed if I eat food from a can, so I try to cut back.” The good news is that there are simple steps you can take to reduce your exposure to potentially dangerous chemicals. Here’s what the experts do:

1. Eat well and exercise. The healthier your body is, the better your immune system will be at defending against the toxins that it encounters, says Woodruff.

2. Buy fresh produce if possible (no packaging!), and choose foods in glass containers instead of metal cans. More than 10 studies have detected BPA leaching from metal can linings into foods. (A few companies, like Eden Foods and Pomi, make some BPA-free containers.) Especially avoid buying canned acidic foods like tomatoes, Vandenberg says, as the acid encourages the chemical to leach into the food.

3. “Don’t put plastics in the microwave,” says Teresa Woodruff, Ph.D., director of the Center for Reproductive Research at Northwestern University. Some plastic storage containers contain BPA; heat can release the chemical, causing it to leak into food. “One of the frustrations about the health risks of plastics is, unlike food or some cosmetics, we have few ways of knowing what chemicals are in there. They don’t come with any kind of ‘nutritional’ label,” says Susan Freinkel, author of *Plastic: A Toxic Love Story*. To see if your containers are made with BPA, check the number on the bottom. Avoid those marked 7; they often contain BPA and shouldn’t be heated

Caused by Chemicals?

Scientists are investigating whether this list of illnesses could be linked to toxins in our environment. To lower your risk, follow the steps on this page.

- Breast cancer • Diabetes
- Heart disease
- ADHD • Endometriosis
- Infertility • Lupus
- Polycystic ovary syndrome

or washed in the dishwasher. Numbers 1, 2 and 5 are unlikely to contain BPA.

4. “Always buy organic versions of foods that have edible skins—think peaches, apples, berries, leafy greens and celery—to avoid exposure to pesticides,” says Perrine. “My family also eats mostly free-range beef and chicken and avoids processed foods.”

5. Check the safety of your cosmetics and personal-care products on cosmetics database.com, a site from the nonprofit Environmental Working Group that ranks products’ potential health impacts. “Enter the five items you use most,” Vandenberg says, and if they come back as “high hazard,” “see if there’s a safer product.” Two we like: Josie Maran Cosmetics and Burt’s Bees.

6. Cut back on cleaning products with fragrance or air fresheners. Phthalates are often used in some of these products to make fragrances last longer. (Some companies, like SC Johnson, are beginning to phase out phthalates.)

7. “Filter your tap water,” advises Teresa Woodruff. Some experts worry that tap water contains pesticides, some of which are suspected endocrine disruptors.

8. Take off your shoes before entering your home. Otherwise, “you’ll track in things from outdoors, like pesticides and cancer-causing substances,” says Lynn Hildemann, Ph.D., an expert on air pollution at Stanford University.

The bottom line, says Dr. Peeke: “Be proactive. Don’t wait for some governmental agency to announce, ‘Whoa, don’t eat that,’ because by the time they do, too many people will have suffered. We already know these simple steps can make a difference.” ■

Melinda Wenner Moyer has written for Scientific American and Slate.



Food Red Flag
BPA inside certain metal containers may seep into acidic tomatoes. Buy yours in glass when you can.