

Toxics and Plastics

Plastic makes our lives easier. We use products made from plastic for hundreds of purposes, including packaging, toys, furniture, computers, food containers, trash bags, foam cups, pipes, shrink wrap, outdoor furniture among many uses. As a society we are now realizing that plastic products bring health risks that we didn't previously recognize.

The Smart Plastics Guide reports, “a myriad of petroleum-based chemicals go into the manufacture of plastics. These chemicals can leach into food and drinks and affect human health. The leaching increases when plastic comes in contact with oily or fatty foods, when heated, or when it becomes old or scratched. The types of plastics shown to leach toxic chemicals are polycarbonate, PVC and styrene. This does not imply that other plastics are entirely safe. These plastics have just been studied more.”

For perspective on plastics, the U.S. generates or imports about 42 billion pounds of chemicals per day, leaving Americans awash in a sea of synthetics. These are the molecules that shape the new materials that attempt to make good on the old slogan, “better living through chemistry.” These ingredients are found in items like baby bottles, plastic food containers, ice chests and big-screen TVs, even some fabrics. The chemicals in these substances have a habit of finding their way out of these products and into the environment — and ultimately into people, animals and plants.

A recent biomonitoring survey by the Center for Disease Control (CDC) found an average of 212 chemicals in Americans — including toxic metals like arsenic and cadmium, pesticides, flame retardants and even perchlorate, a rocket fuel ingredient. “It's not the environment that's contaminated so much,” says Dr. Bruce Lanphear, director of the Cincinnati Children's Environmental Health Center. “It's us.”

As scientists refine their ability to detect chemicals in our bodies, they're discovering that even tiny quantities of toxins have a potentially serious impact on our health — and our children's future. Chemicals like bisphenol-A (BPA) and phthalates — key ingredients in plastics — disrupt the delicately-tuned endocrine system, leading to developmental problems. A host of modern ills that have been rising unchecked for a generation — obesity, diabetes, autism, attention-deficit/hyperactivity disorder — the chemicals in plastics are prime suspects in these conditions.

“We don't give environmental exposure the attention it deserves,” says Dr. Philip Landrigan, director of the Children's Environmental Health Center at New York City's Mount Sinai Medical Center. “But there's an emerging understanding that kids are uniquely susceptible to environmental hazards.”

Toxicity is not the only problem with plastics. An equally serious issue is their persistence. Plastics don't break down like natural substances. They persist in the environment long after they complete their original purpose. Estimates are that about ten percent of all plastics eventually float into the oceans where small particles make

their way into the food chain. All sea creatures from whales down to tiny zooplankton are threatened by floating plastic. Captain Charles Moore, sailing through the Pacific, found a huge patch of floating plastic, hundreds of miles across. He writes about “a basic moral horror in seeing the consequences: a sea turtle with a plastic band strangling its shell into an hourglass shape; a humpback whale towing plastic nets that cut into its flesh, and make it impossible to hunt.” More than a million seabirds, 100,000 marine mammals and countless fish die just in the North Pacific each year, either from mistakenly eating junk plastic or from becoming ensnared in it and drowning.

The plastic floating in the ocean is only the visible side of the problem. A close examination of sea water shows that while plastic molecules do not break down, the material does fracture into smaller and smaller pieces. By dragging a fine net through ocean water, researchers find that minuscule plastic pieces, some barely visible, swirl through the ocean almost like fish food. As fish ingest the plastic, the chemicals move up the food chain, eventually often into people. Scientists are just now beginning to see long term consequences of all this plastic that is migrating into the food chain.

On land the situation is equally challenging. Dr. Marc Goldstein, MD, director of the Cornell Institute for Reproductive Medicine, observed that fertility rates have been declining and exposure to synthetic estrogen found in plastic can have an adverse effect. This is because the whole biosphere is becoming mixed with plastic particles. The more we use plastic, the more we are unwittingly exposing ourselves to low levels of toxicity.

Dr. Frederick vom Saal, a professor at the University of Missouri at Columbia, studies estrogenic chemicals in plastics. He warns parents to “steer clear of the polycarbonate baby bottles. They’re dangerous for newborns whose brains, immune systems and gonads are still developing.” Dr. vom Saal’s research findings hit him so intensely that he went home and threw out every polycarbonate plastic item in his house. He then stopped buying all plastic-wrapped foods and canned goods at the grocery store (because of their plastic covering). “We now know,” he said, “that BPA causes prostate cancer in mice and rats and abnormalities in the prostate’s stem cell, which is the cell implicated in human prostate cancer.”

This is just the beginning of the perils of plastic. None of these problems will be fixed overnight, but the more we learn, the more we realize the need to address this problem. Here are some ways to reduce exposure to the worst aspects of plastics:

◆ **Reduce the use of plastics**

Minimize the use of items made from plastics. Wherever possible, find alternatives.

◆ **Find alternatives to plastic bags**

Use alternatives to plastic packaging whenever possible. Use refillable containers at your local food cooperative. Bring your own take-home containers to restaurants. Bring reusable cloth bags or cardboard boxes to the grocery store. If disposable bags are needed, use biodegradable bags made from corn or other natural substances.

◆ **Never place plastic containers in the microwave**

Since chemicals are released when plastic is heated, it's safest not to microwave food and drinks in plastic containers. Instead use paper, glass or ceramic containers free of metallic paint. If you do microwave in plastic, use only plastic labeled "microwave safe." Note that "microwave safe" does not mean that there is no leaching of chemicals.

◆ **Avoid plastic water bottles**

Bottled water, because it is less regulated, has less-certain purity than tap water. If you do use plastic water bottles, take precautions. If you use a polycarbonate water bottle, do not use it for warm or hot liquids. Discard old or scratched bottles. For all types of plastic, reduce bacterial contamination by thorough washing daily. However, avoid using harsh detergents that can break down the plastic and increase chemical leaching. If you're worried about tap water quality, install a home water filter or use an inexpensive filter pitcher or use the biodegradable bio-based plastic water bottles.

◆ **Do not buy or use plastic toys made with Polyvinyl Chloride (PVC)**

PVC is used for cling wrap, some plastic squeeze bottles, cooking oil and peanut butter jars, detergent and window cleaner bottles, and trays in boxed cookies and chocolates. PVC is a known carcinogen. It also contains phthalates which disrupt hormones. Both the manufacture and incineration of phthalates releases dioxin, a dangerous carcinogen and hormone disruptor. PVC can also cause developmental and reproductive damage. Substitute glass products or wooden or cloth toys for your children.

◆ **Beware of cling wraps**

Instead, use waxed paper or a paper towel for covering foods. If you do use plastic, do not let the plastic touch the food. For plastic-wrapped deli foods, slice off a thin layer where the food came in contact with the plastic and re-wrap in non-PVC plastic wrap or place in a container. Do not microwave foods with cling wraps on them.

◆ **Eliminate styrofoam**

Polystyrene is a popular form of plastics. Styrofoam is the most widely used form. It is used in cups, bowls, plates, take-out containers, meat trays and egg cartons, as well as packaging for shipping and building insulation products. Avoid this form of plastic because it can leach styrene into food, especially when heated. As of June, 2011 styrene is classified as a human carcinogen by the U.S. Dept. of Health and Human Services. It is also harmful to the environment. It does not break down, and it is made with petroleum, a non-sustainable resource. In its place use ceramic cups or recycled paper products.

◆ **Check the plastics that you use as bottles for babies**

Babies and children are at the greatest risk from toxics in plastics. Use alternatives to polycarbonate plastic baby bottles and "sippy" cups. Avoid plastics containing a #3, #6 or #7 on the label. If you must use plastic, choose those with a #1, 2, 4, or 5.

