

Phthalates: Should You Be Concerned?

By Yi Li, Environmental Health Columnist
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If you own anything that's plastic and flexible, chances are likely that you own something containing phthalates. Phthalates, also known as phthalate esters, were first introduced in the 1920s and are a group of compounds added to plastics to convert them from a hard to a flexible plastic. When added to a hard plastic substance, phthalates react with the polyvinyl molecules, disrupting the rigidity of their interactions and allowing them to slide over one another more easily. Different types of phthalates are found in products as diverse as flooring material, PVC pipes, perfumes, pesticides, children's toys, nail polish, adhesives, cars, medical devices and caulk. Debates in the health literature about the potential harms of phthalates are ongoing, but worth examining. In this article, I will present some basic information on current knowledge about phthalates' effects on human health and argue that the U.S. should regulate the manufacture of phthalates.



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In the body, phthalates are fat soluble, so when ingested, will tend to accumulate in areas of the body with a high fat concentration. A National Health and Nutrition Examination survey conducted in 2003 found that most of the U.S. population had some measurable exposure to various phthalates. In high doses, several phthalates have been shown to stimulate hormonal activity in rodent models. One particular phthalate, DEHP, has been recognized as a testicular toxicant and an androgen disruptor, leading to malformation of male genitalia and death of testicular germ cells. At even low exposures, another type of phthalate, DBP, has been shown to act as an endocrine disruptor and damage the reproductive system in male rats. Some phthalates are also thought to be estrogen imitators, potentially causing infant boys to display an increase in female sexual characteristics. In 2005, a study conducted at the University of Missouri-Columbia showed that infant boys born to mothers with high phthalates urine concentrations displayed a significant shortening of the anogenital distance (AGD), a smaller penis size, and were more likely to have non-descended testes. The National Toxicology Program, however, has criticized this study for its use of a small sample population from a homogenous area. Further studies are currently underway to provide more conclusive data.

Despite all this literature on the harmful effects of phthalates, research indicating the contrary – that there are no harmful effects of phthalates on human health – also exists. A study conducted by the Children’s National Medical Center showed no conclusive adverse physical or chemical effects in adolescent children who were exposed to phthalates as neonates. Additionally, a study conducted in September of this year showed that high levels of DEHP phthalate caused no adverse effect on the development of sex organs in male marmosets.

Given that there is some uncertainty about the dangers of phthalates, what should we as consumers do to protect ourselves from possible adverse effects? The European Union has already banned the use of six phthalates in the production of children’s toys as a precautionary measure against potential harms. The regulation of phthalates is an excellent illustration of the Precautionary Principle at work. That is, even in the absence of definitive data concerning the harms of phthalates, those who create public policy have an obligation to take precautionary measures and ensure public safety by enacting policies that mandate safer alternatives-- unless and until phthalates are proven to be safe.

Manufacturers and lobbyists may insist that a switch from phthalates to other substances will be expensive, but these costs are often exaggerated. Even if the costs are substantial, they would diminish over time after the switchover. From a public health perspective, the public has a right to insist on safer alternatives, even if the risks of phthalates and the costs involved in restricting or banning them are controversial. The FDA does not mandate manufacturers to investigate the risks of their products before marketing; thus, the burden of investigations falls upon scientists and public health officials – a process that may take years to complete. A responsible approach in the meantime would be to restrict the use of phthalates until more conclusive data is available.

For additional information on phthalate safety, see the U.S. EPA website, the Center for Food Safety and Applied Nutrition website of the FDA, the Official Journal of the European Union (with a recently published commission recommendation on risk reduction measures), and the website of the CDC. The Phthalate Information Center (www.phthalate.org) of the American Chemistry Council provides the perspective of phthalate manufacturers.

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