

Aggregate Exposures to Phthalates in Humans

The below excerpt is from an article published by Health Care Without Harm.

EXECUTIVE SUMMARY

Phthalates are a family of chemicals that are produced in the millions of tons annually worldwide, and are a principal component of many diverse products that consumers come into contact with at home, at work, and in hospitals. They include products made of flexible polyvinyl chloride plastic (PVC), cosmetics and other personal care goods, pesticides, building materials, lubricants, adhesives, and film, among other items.

Phthalates are released into the environment by manufacturers and escape from consumer products in which they are used. Worldwide ecosystem contamination and direct contact with phthalate-containing products result in virtually ubiquitous human exposures. Health effects that may be caused by exposure to phthalates differ among the various individual compound and depend on the timing and the size of the dose. Young, developing organisms are more vulnerable to exposure to phthalates than adults. In particular, the developing male reproductive tract appears to be the most sensitive endpoint, although effects on the liver, kidneys, lungs, and blood clotting are also of concern.

In animal tests considered relevant to humans, several of the phthalates, including di-(2-ethylhexyl) phthalate (DEHP), di-butyl phthalate (DBP), benzyl butyl phthalate (BBP), and perhaps di-isononyl phthalate (DINP), interfere with male reproductive tract development and are toxic to cells in the testes responsible for assuring normal sperm and hormone production. Human exposure to DEHP from PVC medical devices used in patient care has been known for some time. Expert panels of the US National Toxicology Program (NTP) and Health Canada, as well as the US Food and Drug Administration (FDA), however, have recently reviewed the toxicology of DEHP and considered exposures to patients that may result from the use of DEHP-containing equipment. Each review concluded that some patients are likely to be exposed to potentially unsafe amounts of DEHP while receiving medical care. Testing by the US Centers for Disease Control and Prevention (CDC) recently showed that phthalate exposures are virtually ubiquitous in the general population.

Women of reproductive age experience some of the highest exposure levels to phthalates that can interfere with normal male reproductive tract development. In this report, we summarize what is known about human exposures to phthalates and consider the potential health impacts of exposure to real-world mixtures of these chemicals. Using a relative potency approach, based on what is known about mechanisms of action and available experimental data, it becomes clear that, for a large number of women of reproductive age, their aggregate exposure to phthalates is sufficient to significantly increase the risk of abnormal development in male fetuses and baby boys. Women of reproductive age who require medical care may be exposed to additional phthalates, largely DEHP, in the medical setting, that, depending on the procedure, can add significantly to their existing levels. According to sample data from the CDC, an estimated 5% of women of reproductive age from the general population are contaminated with 75% or more of the level of just one of the phthalates, DBP, that may begin to impair normal reproductive tract development in their baby boys. Many of these women are also regularly exposed to significant amounts of BBP and DEHP, so that their aggregate exposures pose even greater risks. When any of these women requires medical care that exposes them to additional DEHP from PVC medical devices, even more is added.