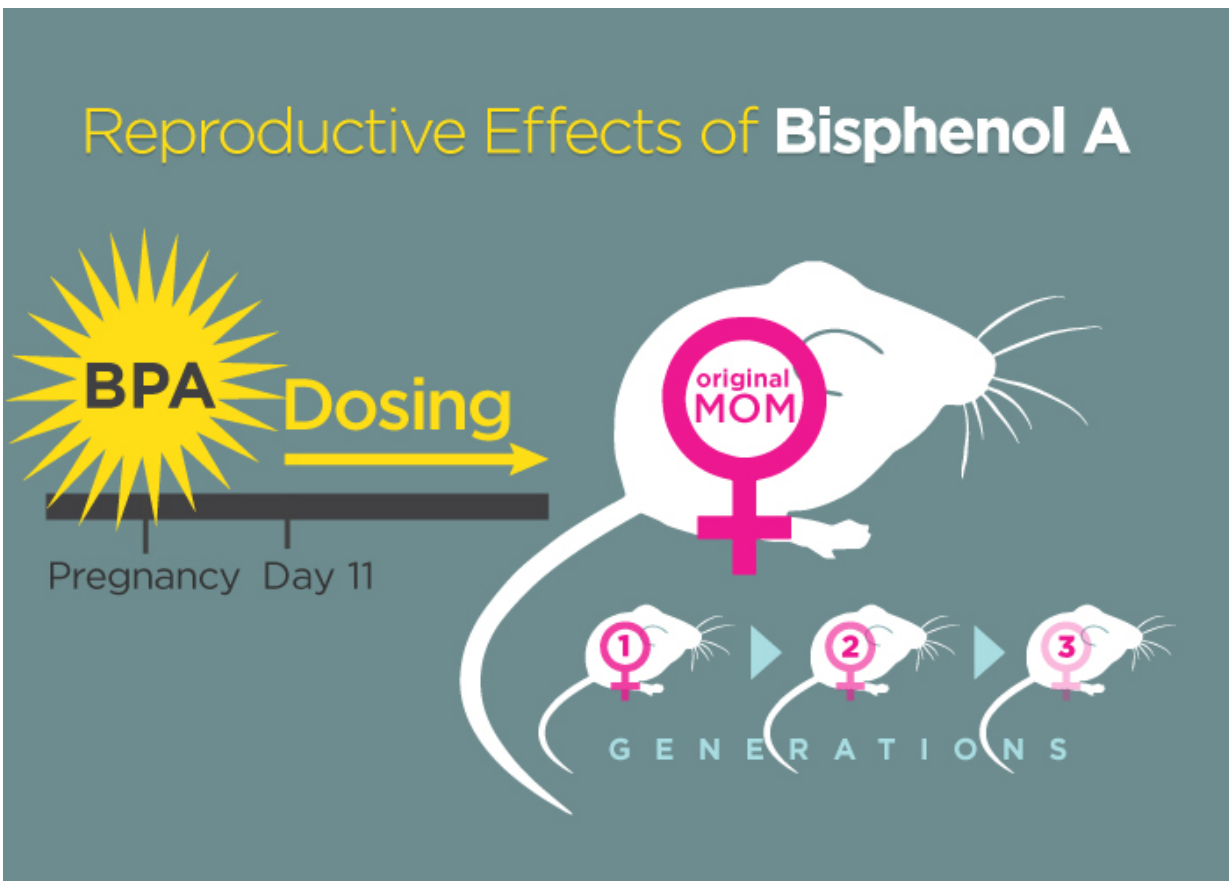


BPA exposure affects fertility in next three generations of mice

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BPA exposure during pregnancy was associated with reproductive problems in the next three generations of mice, researchers report. Credit: Jodi Flaws

When scientists exposed pregnant mice to levels of bisphenol A

equivalent to those considered safe in humans, three generations of female mouse offspring experienced significant reproductive problems, including declines in fertility, sexual maturity and pregnancy success, the scientists report in the journal *Toxicology and Applied Pharmacology*.

Bisphenol A, an industrial chemical, is found in polycarbonate plastics used in food and drink packaging, and in epoxy resins, which coat the insides of some food containers and plumbing pipes. Thermal paper receipts and dental sealants also may contain BPA.

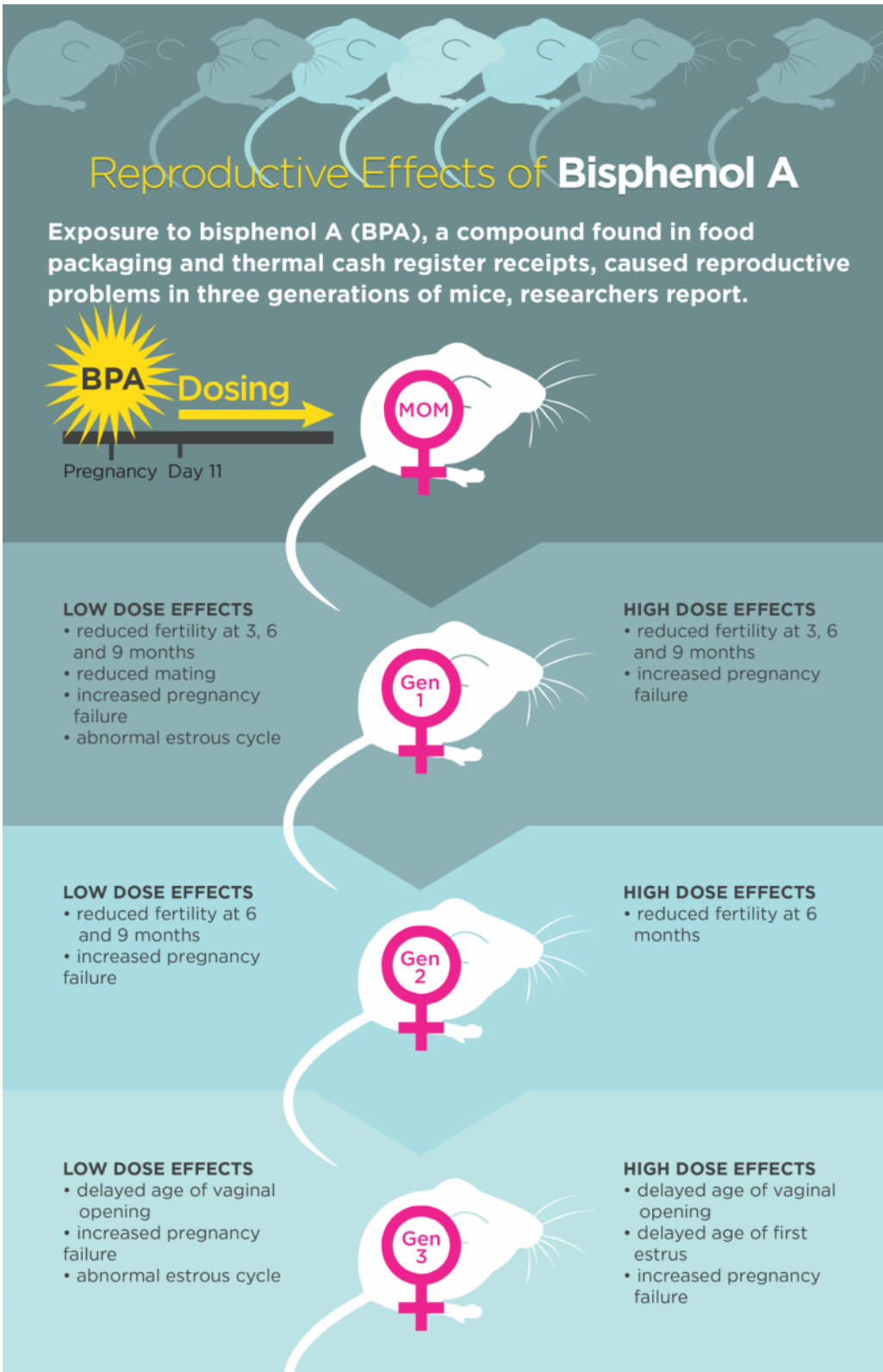
A national study found detectable levels of BPA in 93 percent of 2,517 human urine samples tested in 2003-04, suggesting that most of the U.S. populace is regularly exposed to the chemical. BPA also has been detected in human ovarian follicular fluid, placental tissue and fetal plasma, said University of Illinois comparative biosciences professor Jodi Flaws, who led the new analysis. According to the National Institutes of Health, the primary route of human exposure to BPA is diet.

BPA is an endocrine disruptor, which means that it can interfere with the body's normal hormone signaling. Many studies in animals indicate that BPA exposure can undermine reproductive function, but no previous studies have looked for its effects in three generations of offspring.

"Our study followed up on a previous study of ours that found that BPA can affect the development of the ovary and reduce fertility in the pups of pregnant mice exposed to the chemical," Flaws said. "We found that exposing them to levels of BPA which are below what the U.S. Food and Drug Administration says is a safe dose causes reproductive problems in these mice."

Compared with controls and depending on the dose, many of the mice in the new study saw reductions in fertility and in their ability to carry a

pregnancy to term. The first generation of pups also experienced an abnormal estrous cycle and engaged less in typical mating behavior than mice that had not been exposed in the womb.



Scientists with the U.S. Centers for Disease Control and Prevention found bisphenol A in more than 90% of urine samples tested from a representative sample of the U.S. population.

Credit: University of Illinois at Urbana-Champaign

The third generation - which was not directly exposed to BPA either as a fetus or as an egg in a fetus in its mother's womb - experienced later [sexual maturity](#), reduced fertility and lower pregnancy success than mice whose ancestors were not exposed to BPA. In this generation, the lowest dose of BPA exposure (given to their great-grandmothers) interfered most with their fertility.

"In toxicology, a lot of times people think: The higher the dose, the worse it is," Flaws said. "But with endocrine-disrupting chemicals, it's sometimes the low doses that cause the most profound effects."

Studies in humans suggest BPA also interferes with human fertility and reproductive function, Flaws said.

"There are a lot of studies out there, and when you look at BPA in women's reproductive health, there are a lot of consistencies with the animal studies," she said. "Many of the studies in women have been done by Dr. Russ Hauser at Harvard. He has shown that urinary concentrations of BPA were associated with reduced fertility and women's ability to get pregnant. So I personally think there is pretty good evidence that BPA is a reproductive toxicant in [mice](#) as well as in humans."

More information: The effects of in utero bisphenol A exposure on reproductive capacity in several generations of mice, www.sciencedirect.com/science/.../ii/S0041008X1500085X

Provided by University of Illinois at Urbana-Champaign

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