

ISSUE BRIEF



Are Bisphenol A (BPA) Plastic Products Safe for Infants and Children?

By Diana Zuckerman, PhD, Paul Brown, BS, and Laura Walls, BA

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Bisphenol A (BPA) is a chemical used to make plastics, and is frequently used in baby bottles, sports equipment, water bottles, medical devices, and as a coating in food and beverage cans. It leaches out of plastic into liquids and foods, and the Centers for Disease Control and Prevention found measurable amounts of BPA in the bodies of more than 90 percent of the U.S. population studied.¹

The highest estimated daily intakes of BPA occur in infants and children.² Many plastic baby bottles contain BPA, and BPA is more likely to leach out of plastic when its temperature is increased, as when one warms a baby bottle or warms up food in the microwave.²

Scientists are concerned about BPA's behavioral effects on fetuses, infants, and children at current exposure levels, and whether it can affect the prostate gland, brain, and behavior.² There is also concern about the impact of BPA on the mammary gland and early puberty in girls. BPA mimics and interferes with the action of estrogen—an important reproduction and development regulator.³ Studies have also linked BPA to miscarriages, insulin resistance (a risk factor for Type II diabetes), and increased formation and growth of fat cells (which can lead to obesity).⁴ While early concerns were based primarily on animal studies and research

on cells, there is increasing evidence from human studies that BPA causes serious harm.

BPA experiments on rats linked the chemical to precancerous lesions in the prostate and mammary glands, and to early puberty in females at BPA dosages similar to human exposures, according to a 2008 report on BPA by the National Institutes of Health's National Toxicology Program.² Studies have linked the hormonal effects of BPA from canned cat food to the epidemic of hyperthyroidism in cats, especially females.⁵ After studies of rats and mice linked BPA to hyperactivity and brain activity, the first study of nonhuman primates found that BPA levels were associated with cognitive problems that could affect learning and memory.⁶

The National Toxicology Program 2008 report recommended that more studies be conducted on BPA's health effects on humans, and the report stated: “The possibility that bisphenol A may alter human development cannot be dismissed.”²

Also in 2008, based primarily on two chemical industry-funded studies, the Food and Drug Administration (FDA) claimed that BPA is safe.³ However, according to a publication of the American Chemical Society, the national professional association for chemists, 153

government-funded BPA experiments on lab animals and tissues found adverse effects while only 14 did not.¹

After the 2008 National Toxicology report and FDA report, new studies of humans added greatly to concerns about the health risks of BPA.

In the fall of 2008, a major study was published in the *Journal of the American Medical Association* indicating that adults with higher levels of BPA in their bodies were more likely to be diagnosed with diabetes or heart disease.⁷ Adults with higher BPA were also more likely to be obese, but diabetes and heart disease were correlated with BPA levels even when obesity was statistically controlled.

Is it possible that BPA is contributing to the obesity epidemic and diabetes epidemic among children and adults? Wouldn't it be ironic if the most popular water bottles for athletes contributed to obesity and diabetes?

A study published in October 2008 found that cancer cells exposed to low levels of BPA were more resistant to chemotherapy.⁸

A 2009 research article reported that men who were exposed to very high levels of BPA at work were four times as likely to experience erectile dysfunction and reduced sexual desire compared to men who did not work with BPA.⁹ BPA-exposed workers were also seven times as likely to have problems with ejaculation. Although the men in this study had much higher levels of BPA exposure than the average man, this study demonstrates that BPA can harm men's sexual health and that workers need to be protected. Research is needed to study the effects of more typical BPA exposures on men's sexual health.

Even before this most recent study, the FDA Science Board, which consists of independent scientists who do not work for the FDA, disagreed with the FDA's safety claims. The Science Board recommended in October 2008 that the FDA analyze the research literature again, relying less on the two industry-funded

studies and taking into account the best independent studies. It also recommended that new research be conducted to examine BPA safety concerns. Government funding for that research was announced in late 2009.

While we wait for more research to be conducted, you may want to avoid BPA. Is that possible? BPA is found in polycarbonate (PC) plastics, which are typically clear and hard, marked with the recycle symbol "7" or may contain the letters "PC" near the recycle symbol. To avoid the risks of baby bottles with BPA or other questionable chemicals, parents should look for packages that say "BPA-free" and also consider alternatives such as glass bottles. And to avoid warming up food in plastic containers with these chemicals, use stoneware, china, or glass dishes and containers in your microwave.

In 2008, Canada announced that it intended to reduce infant and newborn exposure to BPA by banning its use in baby bottles, setting stringent BPA migration standards in infant formula cans, and working with industry to develop alternative food packaging.¹⁰ In the U.S., bills were introduced in several states, cities, and in the U.S. Senate and House of Representatives (S. 593/H.R. 1523) to ban BPA in children's products. Suffolk County in New York became the first in the U.S. to ban BPA in baby bottles and sippy cups, in March, 2009.

Alternatives to BPA are available. In 2008, manufacturers such as Playtex and Nalgene and retailers such as Wal-Mart pledged to remove BPA from their products and stores by the end of the year.¹¹ In March 2009, the six major manufacturers of baby bottles in the United States announced that they would no longer sell baby bottles made with BPA in the U.S.¹² A few days later, SUNOCO, a BPA manufacturer, announced that it would require customers to confirm that no BPA would be used in food or water containers for children under 3 years of age.¹³

However, BPA is in many canned food and beverages sold to people and pets in the U.S. and other countries. At least two producers of canned foods in the U.S. have BPA-free cans:

Eden Foods began using BPA-free cans in 1999 and now uses BFA-free cans for everything except highly acidic tomato products, and Vital Choice introduced new cans and pouches for its fish products at the end of 2008.^{14, 15} According

to Eden, it costs the company \$300,000 more a year to produce BPA-free cans, which are 14% more expensive than industry standard cans; this translates into about 2 cents more per can.¹⁶

¹ Hileman, B. (2007, April). Bisphenol A on Trial. *Chemical & Engineering News Government & Policy*, Vol. 85, Number 16. Retrieved April 3, 2009 from <http://pubs.acs.org/cen/government/85/8516gov2.html>

² National Toxicology Program. U.S. Department of Health and Human Services (HHS). (2008, September). NTP-CEHR Monograph on the Potential Human Reproductive and Developmental Effects of Bisphenol A. Retrieved April 3, 2009 from <http://cerhr.niehs.nih.gov/chemicals/bisphenol/bisphenol.pdf>

³ Schierow, L., Lister, S.A. (2008, May). Bisphenol A (BPA) in Plastics and Possible Human Health Effects. Congressional Research Service Report for Congress, The Library of Congress.

⁴ Environmental Working Group. (2007, March). Bisphenol A: Toxic Plastics Chemical in Canned Food. Retrieved April 3, 2009 from <http://www.ewg.org/book/export/html/20928>.

⁵ Edinboro, C.H., Scott-Moncrieff, C., Janovitz, E., Thacker, H.L., and Glickman, L.T. (2004). Epidemiologic study of relationships between consumption of commercial canned food and risk of hyperthyroidism in cats. *Journal of the American Veterinary Medical Association*, 224(6), 879-886.

⁶ Leranath, C., Hajszan, T., Szigeti-Buck, K., Bober, J., and Maclusky, N.J. (2008). Bisphenol A prevents the synaptogenic response to estradiol in hippocampus and prefrontal cortex of ovariectomized nonhuman primates. *Proceedings of the National Academy of Sciences of the United States of America*. *PNAS*, 105(37), 14187-14191.

⁷ Lang I.A., Galloway T.S., Scarlett A. et al. (2008). Association of Urinary Bisphenol A Concentration With Medical Disorders and Laboratory Abnormalities in Adults. *Journal of American Medical Association* 300(11),1303-1310.

⁸ LaPensee, E.W., Tuttle, T.R., Fox, S.R., & Ben-Jonathan, N.B.(2008). Bisphenol A at Low Nanomolar Doses Confers Chemoresistance in Estrogen Receptor Alpha Positive and Negative Breast Cancer Cells. *Environmental Health Perspectives*, 117 (2), 175-180.

⁹ Li, D., Zhou, Z, Qing, D., et al. (November 10, 2009). Occupational Exposure to Bisphenol-A (BPA) and the Risk of Self-Reported Male Sexual Dysfunction. *Human Reproduction, online publication*, 1-9. doi:10.1093/humrep/dep381

¹⁰ Health Canada, (April 18, 2008). Government of Canada Takes Action on Another Chemical of Concern: Bisphenol A. Press release retrieved April 3, 2009 from http://www.hc-sc.gc.ca/ahe-asc/media/nr-cp/_2008/2008_59-eng.php

¹¹ Parker-Pope, T. (2008, April 22). A Hard Plastic is Raising Hard Questions. *The New York Times*. Retrieved on April 3, 2009 from <http://www.washingtonpost.com/wp-dyn/content/article/2009/03/05/AR2009030503285.html>

¹² Layton, L. (2009, March 6). No BPA for Baby Bottles in U.S. *The Washington Post*. Retrieved on April 3, 2009 from <http://www.washingtonpost.com/wp-dyn/content/article/2009/03/05/AR2009030503285.html>

¹³ Rust, S. and Kissinger, M. (2009, March 12). Maker acknowledges BPA worries. *JSOnline. Milwaukee Wisconsin Journal Sentinel*. Retrieved on April 3, 2009 from <http://www.jsonline.com/watchdog/watchdogreports/41186522.html>

¹⁴ <http://www.edenfoods.com/about/environment.php> Retrieved on April 6, 2009.

¹⁵ http://newsletter.vitalchoice.com/e_article001303243.cfm?x=b11.0.w Retrieved on April 6, 2009.

¹⁶ Deardoff, J. (2008, June 30). Where to find BPA free cans. *Julie's Health Club*. Retrieved on April 6, 2009 from http://featuresblogs.chicagotribune.com/features_julieshealthclub/2008/06/where-to-find-b.html