



New Studies Raise Increased Concerns About Common Exposures to Bisphenol A

- **Premature babies hospitalized in neonatal intensive care units had levels of BPA in their urine 10 times higher than the general population.** *Exposure to Bisphenol A and other Phenols in Neonatal Intensive Care Unit Premature Infants*, A M Calafat, J Weuve, X Ye, L Jia, et al, *Environ. Health Perspectives* in Press, Dec. 2008 www.ehponline.org/docs/2008/0800265/abstract.html
In this first study examining infants' exposure to bisphenol A, premature babies hospitalized in neonatal intensive care units had levels of BPA in their urine 10 times higher than the general population. The source of exposure most likely was plastic medical devices used in the hospital, although some could have come from infant formula. BPA is a plastic compound that is linked to various health abnormalities in humans and lab animals. www.environmentalhealthnews.org
- **First evidence that maternal exposure to BPA during lactation increases mammary carcinogenesis.** *Oral Exposure to Bisphenol A Increases Dimethylbenzanthracene-Induced Mammary Cancer in Rats*, S Jenkins, N Raghuraman, I Eltoun, M Carpenter, J Russo, and CA Lamartiniere, *Environ. Health Perspectives* in Press, Jan. 2009 www.ehponline.org/docs/2009/11751/abstract.html
Researchers gave female rats with nursing litters oral doses of BPA. The result: The baby rats matured with higher levels of breast cancer. This study provides the first evidence that maternal exposure to BPA during lactation increases mammary carcinogenesis in rodents. Animals were tested at concentrations of BPA similar to exposures experienced by people. Co-author Lamartiniere noted, "In fact, it's below the concentration that the EPA deems safe. With BPA we're finding changes that are consistent with oncogenesis, or cancer causation." (Quote from Birmingham News, 1-11-09.)
- **BPA exposure linked to heart disease, diabetes and liver abnormalities in humans.** *Association of urinary bisphenol A concentration with medical disorders and laboratory abnormalities in adults*. IA Lang, TS Galloway, A Scarlett, WE Henley, et al. *JAMA*. 2008, 300(11): 1303-10. Bisphenol A (BPA) is widely used in epoxy resins lining food and beverage containers. Evidence of effects in animals has generated concern over low-level chronic exposures in humans. This study examined associations between urinary BPA concentrations and adult health status, using data from the National Health and Nutrition Examination Survey 2003-2004 for 1455 adults aged 18 through 74 years. Higher urinary BPA concentrations were associated with cardiovascular diagnoses in age-, sex-, and fully adjusted models, also with diabetes, and with clinically abnormal concentrations of the liver enzymes gamma-glutamyltransferase and alkaline phosphatase. The authors conclude that higher BPA exposure, reflected in higher urinary concentrations of BPA, may be associated with avoidable morbidity in the community-dwelling adult population.
- **New study demonstrates an adverse effect of BPA on the brains of nonhuman primates.** *Bisphenol A prevents the synaptogenic response to estradiol in hippocampus and prefrontal cortex of ovariectomized nonhuman primates*. Leranath C, Hajszan T, Szigeti-Buck K, Bober J, MacLusky NJ. *Proc Natl Acad Sci U S A*. 2008, 105(37): 14187-91. Exposure measurements from several countries indicate that humans are routinely exposed to low levels of bisphenol A (BPA). Previous studies demonstrated BPA's interference with the development of many organs and ability to alter cognitive functions and mood in rodent studies. This study examined the influence of continuous BPA administration, at a daily dose equal to the current EPA reference safe daily limit, on estradiol-induced spine synapse formation in the hippocampus and prefrontal cortex of a nonhuman primate model. The study found that even at this relatively low exposure level, BPA completely abolishes the synaptogenic

response to estradiol. Because remodeling of spine synapses may play a critical role in cognition and mood, the ability of BPA to interfere with spine synapse formation has profound implications. This study is the first to demonstrate an adverse effect of BPA on the brain in a nonhuman primate model and further amplifies concerns about the widespread use of BPA in medical equipment, and in food preparation and storage.

- **Prenatal exposure to Bisphenol A is linked to significant adverse reproductive and carcinogenic effects.** *Prenatal Exposure to Bisphenol A at Environmentally-Relevant Doses Adversely Affects the Murine Female Reproductive Tract Later in Life.* R R Newbold, W N Jefferson, E Padilla-Banks. *Environ. Health Perspectives* in Press, Jan. 2009. Exposure to endocrine disrupting chemicals like Bisphenol A during critical development periods causes adverse consequences later in life. In this study the pups of pregnant mice treated with BPA were examined at age eighteen months. The study found that ovarian cysts and ovarian cystadenomas were significantly increased in the BPA exposed group. Some BPA exposed animals experienced more severe pathologies that were not observed in controls, for example atypical hyperplasia, sarcoma of the uterine cervix and mammary adenocarcinoma. These data suggest that BPA causes long-term adverse reproductive and carcinogenic effects if exposure occurs during critical periods of differentiation.

- **Study predicts BPA in babies 11 times higher than adults.** *Predicting plasma concentrations of Bisphenol A in young children (< two years) following typical feeding schedules using a physiologically-based toxicokinetic model.* A Edginton, L Ritter. *Environ. Health Perspectives* in Press, Nov. 2008. www.ehponline.org/docs/2008/0800073/abstract.html Using a mathematical model based on enzymatic differences between newborns and adults, scientists estimate that the amount of bisphenol A (BPA) circulating in the blood of babies is more than 11 times higher than the amount in adult blood. The striking disparity is most likely due to natural differences in metabolism and body size between babies and adults. This study points to the need for chemical exposure standards to better incorporate differences in vulnerabilities between children and adults.

- **Early life BPA linked to permanent hormonal changes resulting in early puberty.** *Neonatal Exposure to Bisphenol A Alters Reproductive Parameters and Gonadotropin Releasing Hormone Signaling in Female Rats.* M Fernández, M Bianchi, V Lux-Lantos, C Libertun. *Environ. Health Perspectives* in Press, Jan. 2009. www.ehponline.org/docs/2009/0800267/abstract.html This study examined how BPA affects reproductive development and hormones in female adolescent and adult rats that were exposed during their first couple of weeks of life. The exposure time frame corresponds to infancy through pre-puberty in humans. Neonatal exposure to BPA accelerated puberty onset and altered estrous cycles. Results demonstrate for the first time that neonatal BPA exposure permanently affects reproductive parameters. Past studies have found similar effects when exposures occur during prenatal development.

- **BPA reduce efficacy of chemotherapy.** *Bisphenol A at Low Nanomolar Doses Confers Chemoresistance in Estrogen Receptor- α -Positive and -Negative Breast Cancer Cells.* E LaPensee, TR Tuttle, SR Fox, N Ben-Jonathan. *Environ. Health Perspectives*, 117(2): 175-80, February 2009. BPA at environmentally relevant doses reduces the efficacy of chemotherapeutic agents. These data provide considerable support to the accumulating evidence that BPA is hazardous to human health.

