May 27, 2011

More than 10 recent human studies show that BPA is toxic at current levels of exposure

• **Cardiovascular disease and diabetes**- A January 2010 study found an association between BPA exposures in Americans and diagnosis with heart disease and diabetes (Melzer 2010). The study, by a team from the University of Exeter, includes nearly 3,000 American adults enrolled in the Centers for Disease Control's National Health and Nutrition Examination Study (NHANES). The researchers examined the data from 2003-04 and 2005-06. They confirm findings published in 2008 that associated BPA exposures and heart disease from participants in the 2003-04 study (Lang 2008).

• **Female fertility** – Two studies of women undergoing in-vitro fertilization found a relationship between BPA levels and egg quality. A study of 84 women at Massachusetts General Hospital Fertility Center found that those with higher BPA levels had fewer mature oocytes (eggs) retrieved for fertilization and lower peak estradiol levels (Mok-Lin 2010). A second study of 58 women at the UC San Francisco Center for Reproductive Health reports that patients with higher BPA levels had impaired fertilization relative to women with lower BPA levels (Fujimoto 2011).

• **Male fertility** – Several studies find a positive association between BPA levels and male sexual function. Among them are three recent studies that report a relationship between BPA exposure and sperm quality. A study of 218 Chinese men, some of whom had occupational exposures to BPA, found clear links between daily BPA exposure and sperm number and quality. Men with undetectable BPA levels were 3 times less likely to have low sperm vitality and 4 times less likely to have low sperm counts (Li 2011). Similar effects are reported by Harvard University scientists in American men recruited through a Boston-area fertility clinic. In these cases the 25% of men with the highest BPA levels had 7% to 23% more sperm problems as measured by number, movement, shape or DNA impairment than the 25% of study participants with the lowest BPA measurements (Meeker 2010). BPA also appears to affect male sex hormone levels. Another Harvard study of 167 male fertility center recruits reports that those with higher BPA concentrations had altered sex levels of 4 sex hormones related to male fertility (Meeker 2010). In China, 200 BPA-exposed workers reported higher rates of erectile and sexual dysfunction relative to 500 non-occupationally exposed men (Li 2010).

• **Polycystic ovarian syndrome (PCOS) –** In Europe, a study found that 71 women diagnosed with PCOS had statistically significant higher levels of BPA compared to 100 women without the disease (Kandaraki 2011).

• **Toddler Behavior** – In a study of 249 Cincinnati-area families, researchers at the University of North Carolina reported an association between prenatal BPA exposure and aggressive behavior in 2-year-olds girls (Braun 2009). Concentrations in mothers were similar to those measured in the general population (Calafat 2008).

<u>These human studies confirm the findings of the dozens of animal studies showing that low levels of BPA can be harmful.</u>

HEADQUARTERS 1436 U St. NW, Suite 100 Washington, DC 20009 I P: 202.667.6982 F: 202.232.2592
CALIFORNIA OFFICE 2201 Broadway, Suite 308 Oakland, CA 94612 I P: 510.444.0973 F: 510.444.0982
MIDWEST OFFICE 103 E. 6th Street, Suite 201 Ames, IA 50010 I P: 515.598.2221

References:

Braun JM, Yolton K, Dietrich KN, Hornung R, Ye X, Calafat AM, Lanphear BP. 2009. Prenatal Bisphenol A Exposure and Early Childhood Behavior. Environ Health Perspect. 117(12): 1945–1952. (doi: 10.1289/ehp.0900979)

Calafat AM, Ye XY, Wong LY, Reidy JA, Needham LL. 2008. Exposure of the US population to bisphenol A and 4-tertiary-octylphenol: 2003-2004. Environ Health Perspect. 116(1): 39-44.

Fujimoto VY, Kim D, Saal FS, Lamb JD, Taylor JA, Bloom MS. 2011. Serum unconjugated bisphenol A concentrations in women may adversely influence oocyte quality during in vitro fertilization. Fertility and Sterility Article in Press, Corrected Proof

Kandaraki E, Chatzigeorgiou A, Livadas S, Palioura E, Economou F, Koutsilieris M, et al. 2011. Endocrine Disruptors and Polycystic Ovary Syndrome (PCOS): Elevated Serum Levels of Bisphenol A in Women with PCOS. J Clin Endocrinol Metab 96(3): E480-4.

Lang IA, Galloway TS, Scarlett A, Henley WE, Depledge M, Wallace R, Melzer D. 2008. Association of Urinary Bisphenol A Concentration With Medical Disorders and Laboratory Abnormalities in Adults. JAMA. 300(11): 1303-1310.

Li D-K, Zhou Z, Miao M, He Y, Wang J, Ferber J, et al. 2011. Urine bisphenol-A (BPA) level in relation to semen quality. Fertility and Sterility 95(2): 625-30.e4.

Li D-K, Zhou Z, Qing D, He Y, Wu T, Miao M, et al. 2010. Occupational exposure to bisphenol-A (BPA) and the risk of self-reported male sexual dysfunction. Hum Reprod 25(2): 519-27.

Meeker JD, Ehrlich S, Toth TL, Wright DL, Calafat AM, Trisini AT, Ye X, Hauser R. 2010. Semen Quality and Sperm DNA Damage in Relation to Urinary Bisphenol A Among Men from an Infertility Clinic. Reprod Toxicol. 30(4): 532-39.

Meeker JD, Calafat AM, Hauser R. 2009. Urinary bisphenol A concentrations in relation to serum thyroid and reproductive hormone levels in men from an infertility clinic. Environmental science & technology 44(4): 1458-63.

Melzer D, Rice NE, Lewis C, Henley WE, Gallowa TS. 2010. Association of Urinary Bisphenol A Concentration with Heart Disease: Evidence from NHANES 2003/06. PLoS 5(1): e8673.

Mok Lin E, Ehrlich S, Williams PL, Petrozza J, Wright DL, Calafat AM, et al. 2011. Urinary bisphenol A concentrations and ovarian response among women undergoing IVF. International journal of andrology 33(2): 385-93.