

Endocrine Disruptors and Neonates

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CALL TO ACTION:

NANN members are encouraged to contact their elected officials in Washington to express their views about the Endocrine Disruption Prevention Act.

[Click here](#) to learn how to contact members of Congress, President Obama, and sign a letter of support.

[Click here](#) to learn more about the The Endocrine Disruption Prevention Act of 2009

BACKGROUND:

Health concerns related to endocrine-disrupting chemicals (EDCs) have been in the news in recent months, and they are of particular concern to those who work with neonates because of their possible effect on neonatal development. An endocrine disruptor interferes with the communication system of glands, hormones, and cellular receptors that control the body's internal functions, one of which is development of the reproductive system. A concern in perinatology is that EDCs might be interfering with normal development of reproductive organs, especially in males, because male genital development is dependent on specific hormones being present at critical times during fetal development. Exposure during these critical developmental windows might be a cause of atypical genitalia (e.g., cryptorchidism and hypospadias) in newborn boys, and, later on, of infertility, testicular cancer, and prostate cancer, all conditions that have increased in incidence since these chemicals became ubiquitous in our lives. The evidence for adverse reproductive outcomes from exposure to EDCs is strong, and evidence for their effects on other endocrine systems (including the neuroendocrine system and the thyroid), obesity and metabolism, and insulin and glucose homeostasis is also mounting.

A group of highly heterogeneous molecules, EDCs include synthetic chemicals used as industrial solvents or lubricants and their byproducts (polychlorinated biphenyls [PCBs], polybrominated biphenyls [PBBs], dioxins), plastics (bisphenol A [BPA]), plasticizers (phthalates), pesticides (methoxychlor, chlorpyrifos, dichlorodiphenyltrichloroethane [DDT]), fungicides (vinclozolin), and pharmaceutical agents (diethylstilbestrol [DES]). Furthermore, some natural chemicals found in human and animal food (e.g., phytoestrogens) can also act as endocrine disruptors. EDCs are widely consumed and are even found in infant formula.

Two EDCs of particular concern for infants and children are BPA and plasticizers (phthalates). BPA is a synthetic chemical used in hard, polycarbonate plastics, such as baby bottles and infant incubators. BPA acts as a weak estrogen in the body. Phthalates are synthetic chemicals used to soften polyvinyl chloride products. Phthalates are found in many flexible plastic products (such as intravenous tubing) and in personal care products (shampoos and lotions). Phthalates are anti-androgenic: they oppose the effect of hormones necessary for male reproductive development. Some exposure to these chemicals comes from inhalation of contaminated dust, but other exposure comes from foods or fluids that are in direct contact with BPA-containing or phthalate-

containing products. Attention to this latter area of exposure is critical to preventing harm from potential EDCs.

To err on the side of caution, we must learn more about EDCs and their potential effects on humans. To do otherwise would be to fail in our role as advocates for the health of newborns. On December 3, 2009, Representative Jim Moran (D-VA) and Senator John Kerry (D-MA) introduced the Endocrine Disruption Prevention Act of 2009 (HR 4190, S 2828) to authorize an ambitious research program in endocrine disruption at the National Institute of Environmental Health Sciences. The goal is to develop reliable and reproducible methods to identify chemicals that can disrupt the human endocrine system and to address the full range of health outcomes from exposure to these chemicals. This information will eventually be used to develop a course of action for dealing with environmental exposure to endocrine disruptors.

Because this issue affects our neonatal patients, NANN's Health Policy and Advocacy Committee has been monitoring developments and seeking to educate members about the proposed legislation. At the Endocrine Disruption Exchange [Web site](#), interested individuals can learn more, and find information about contacting their congressional representatives.

Bibliography

Diamanti-Kandarakis, E., Bourguignon, J. P., Giudice, L. C., Hauser, R., Prins, G. S., Soto, A. M., et al. (2009). Endocrine-disrupting chemicals: An Endocrine Society scientific statement. *Endocrine Reviews*, 30(4), 293–342. Retrieved June 1, 2010, from www.endo-society.org/journals/ScientificStatements/upload/EDC_Scientific_Statement.pdf.

The Endocrine Disruption Exchange. (n.d.). *The Endocrine Disruption Prevention Act of 2009*. Retrieved June 1, 2010, from www.endocrinedisruption.com/endocrine.edlaw.php.

U.S. Congress. House. *Endocrine Disruption Prevention Act of 2009*. HR 4190. 111th Cong., 1st sess. Retrieved June 1, 2010, from www.opencongress.org/bill/111-h4190/text.

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