

Fact Sheet: The Chemical Connection



Endocrine Disrupting Chemicals and Breast Cancer Risk

- Numerous chemicals, both natural and man-made, may interfere with the endocrine system and produce adverse effects in laboratory animals, wildlife, and humans.¹
 - Scientists often refer to these chemicals as “endocrine disruptors.”
 - Endocrine disruptors may turn on, shut off, or modify signals that hormones carry, which may affect the normal functions of tissues and organs.
- Scientists are paying particular attention to endocrine disruptors such as phthalates² and bisphenol A (BPA).³
- There is evidence that exposure to endocrine disruptors, such as phthalates or BPA, may affect when a girl develops breasts or gets her first period.⁴
- Girls who enter puberty early may be at a greater risk for developing breast cancer later in life.⁵

Phthalates

- Phthalates (*THAL-ates*) are chemicals in some detergents; personal care products, like fragrances, nail polish, deodorant, hair care products, and body lotions; plastic food and beverage containers; and plastic or vinyl toys.
 - The ubiquitous use of phthalates results in widespread population exposure.²
 - Phthalates can cross the placenta in pregnant women and have been found in human breast milk.⁵
- Ingestion, inhalation, and skin absorption are potential pathways of exposure. Human exposure to phthalates can occur as a result of:
 - Direct contact or use of products such as deodorant or body lotions containing phthalates;
 - The leaching of phthalates from one product into another, as may occur with food packaging or personal care products;
 - By general contamination of the air, water, food, and other parts of the ambient environment.²

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Bisphenol A (BPA)

- Bisphenol A (*bis-FEE-nawl A*) (BPA) is a chemical in some plastic bottles, food and beverage containers, and the lining of cans. It is a type of phenol. Phenols are readily absorbed following inhalation, ingestion, or skin contact, and are widely distributed in the body, can cross the placenta in pregnant women, and have been found in human breast milk.³
- Human exposure to BPA is primarily through ingestion³, although it may also be inhaled, or absorbed through the skin.
 - BPA can migrate from plastic bottles or food storage containers into foods or beverages especially once the container has been heated to high temperatures (e.g. boiling water).
 - BPA can migrate from the inner lining of some metal food and drink cans into the food or liquid within the can.
 - BPA may also migrate from plastic in some plastic beverage containers and cutlery (forks, knives, and spoons) into hot or fatty foods.
 - BPA is found in some cash register receipts.

Identifying and Reducing Exposure to Phthalates

- Plastic food and drink containers, and plastic or vinyl toys, with the number 3 in the recycling triangle contain phthalates.
- To reduce exposure to phthalates:
 - Reduce use of vinyl and PVC products as much as possible;
 - Opt for products made of cloth, porcelain or ceramic, metal, and glass;⁶
 - When possible, choose products like fragrances, nail polish, deodorant, hair care products, body lotion, cosmetics, detergents, and soap that say “phthalate-free” or do not have the word “phthalate” anywhere in the list of ingredients (this includes ingredients like “di-n-butyl phthalate” or “diethyl phthalate” or “benzylbutyl phthalate”);
 - Consider buying fragrance-free products. Phthalates may not always be listed separately on product labels and may instead be part of what is listed simply as “fragrance” in the ingredients (if the words “phthalate free” are not on the label of a personal care product, a consumer may wish to buy a fragrance-free version if there is a choice);



Cetyl Alcohol, Synthetic Beeswax,
Stearyl Alcohol, Benzyl Alcohol,
DEP (diethyl phthalate)
Methylparaben, Propylparaben,
Butylparaben, BHT, Sodium

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- Reduce use of plastic food and beverage containers, and plastic or vinyl toys with the number 3 in the recycling triangle.

Identifying and Reducing Exposure to BPA

- Plastic food and drink containers with the number 7 in the recycling triangle often contain BPA.
- To reduce exposure to BPA:
 - Microwave food in glass containers (heating food in containers made with BPA releases BPA into the food);
 - Avoid plastic containers with the number 7 in the recycling triangle on the bottom of the container;
 - Do not wash plastic containers in the dishwasher (BPA can leach out of these products when they are heated at high temperatures);⁷
 - Reduce use of canned foods, and eat fresh or frozen foods whenever possible;
 - When possible, opt for glass, porcelain or ceramic, or stainless steel containers, particularly for hot food or liquids;
 - Use infant formula bottles that are BPA free and look for plastic or vinyl toys that are labeled “BPA free”;⁷
 - Wash hands after handling cash register receipts or ask to receive receipts by e-mail, if possible.



To learn more, visit www.info.bcerp.org

¹ National Institute of Environmental Health Sciences. (2010, May). *Endocrine Disruptors*. Retrieved August 28, 2012, from the National Institute of Environmental Health Sciences Web site: <http://www.niehs.nih.gov/health/topics/agents/endocrine/index.cfm>

² Barlow, J., Brown, K., Johnson, J. P., & Scofield, L. (2007, November 7). *Fact Sheet on Phthalates*. Retrieved June 27, 2012, from the Breast Cancer and the Environment Research Program Web site: <http://www.bcerp.org/cotcpubs.htm>

³ Barlow, J., & Johnson, J. P. (2007, November 7). *Fact Sheet on Phenols*. Retrieved June 27, 2012, from the Breast Cancer and the Environment Research Program Web site: <http://www.bcerp.org/cotcpubs.htm>

⁴ Biro, F. M., Greenspan, L. C., & Galvez, M. P. (2012). Puberty in girls of the 21st century. *Journal of Pediatric and Adolescent Gynecology*, 25 (5), 289–294. doi: 10.1016/j.jpag.2012.05.009

⁵ Claudio, L. (2007). Centered on Breast Cancer. *Environmental Health Perspectives*, 115 (3), A132-133.

⁶ Mount Sinai School of Medicine. (n.d.). *Phthalates (MSSM)*. Retrieved September 17, 2012, from the Breast Cancer and the Environment Research Program Web site: <http://www.bcerp.org/cotcpubs.htm>

⁷ National Toxicology Program. (2010, August). *Bisphenol A (BPA) Fact Sheet*. Retrieved September 16, 2012, from the National Toxicology Program Web site: <http://ntp.niehs.nih.gov/index.cfm?objectid=EF1E5313-F1F6-975E-73B55D30B2966A5A>

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