

Fact Sheet for Health Professionals: Endocrine-Disrupting Chemicals and Breast Cancer Risk

Endocrine-Disrupting Chemicals and Health

- Endocrine disruptors are naturally occurring compounds or man-made substances that may mimic estrogen or interfere with the function of other hormones in the body. Endocrine disrupting chemicals (EDCs) are also referred to as having estrogenic effects.
- Many EDCs have been linked with developmental, reproductive, neural, immune, and other problems in wildlife and laboratory animals, even when exposure to such chemicals occur at very low levels.¹
 - The current evidence is strong that the cumulative effect of low-dose exposure to EDCs, especially during particularly vulnerable developmental windows, can lead to long-term consequences in later health.²
 - Although EDC exposures may occur early in life and continue for many years, the results may not manifest themselves for 50 or 60 years.²
- There is evidence that endocrine disruptors lead to adverse reproductive health issues, including some cancers.¹
 - While hormone effects are, for the most part, reversible in adults, animal studies suggest that exposure to hormones, such as EDCs, early in life may affect the structure and function of the target organs in an irreversible manner.²
- Exposure to endocrine disruptors could alter the timing of puberty in girls.³⁻⁴
- Girls who enter puberty early may be at a greater risk for developing breast cancer later in life.⁵

Phthalates and Bisphenol A (BPA)

- Scientists are paying particular attention to endocrine-disrupting compounds called phthalates⁶ and bisphenol A (BPA).⁷

Phthalates

- Phthalates are a group of chemicals used to make certain plastics more flexible. They are used in food and beverage containers, toys, detergents, food packaging, and personal care products such as fragrance, nail polish, deodorant, hair care, and body lotion.
- The ubiquitous use of phthalates results in widespread general population exposure.⁷
Pathways of exposure include:
 - Ingestion, inhalation, and skin absorption;

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- Through the leaching of phthalates from one product into another, as may occur with food packaging;
- Transfer of phthalates from the mother to the developing fetus or while breast feeding her infant.⁷

Bisphenol A

- Bisphenol A (BPA) is a clear plastic chemical with estrogenic effects that is widely used in certain hard-plastic containers, often used for food and beverages, and in the material that lines the insides of many metal cans used for foods.
 - BPA can be released from plastics in concentrations high enough to change gene expression patterns.²
 - Heating plastic containers made with BPA in microwaves releases small amounts into the food or beverage.⁸
- Recent studies have found BPA in some cash register receipts.
- Studies exposing laboratory animals to some EDCs during periods of rapid cellular growth – periods known as “windows of susceptibility” – make animals more vulnerable to their effects. Exposing rodents to BPA during two of these windows of susceptibility (*in utero* and neonatal/prepubertal) resulted in:
 - Increased mammary cancer susceptibility, as demonstrated by a greater number of mammary tumors per animal, as well as decreased time between exposures and cancer progression (latency period).⁹⁻¹²
 - Alterations in protein expression patterns for key proteins involved with the regulation of cell proliferation.⁹⁻¹⁰

Reducing Exposures

Phthalates

- Look at the labels of products like nail polish, deodorant, shampoo, body lotion, cosmetics, detergents, hair spray, and soap. When possible, choose products that say “phthalate-free” or do not have the word “phthalate” anywhere in the list of ingredients. The principal phthalates used in cosmetic products are dibutyl phthalate (DBP), dimethyl phthalate (DMP), and diethyl phthalate (DEP).



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- Consider buying fragrance-free products. Phthalates may not always be listed separately on product labels. Instead, they may be part of what is listed simply as “fragrance” in the ingredients. If parents, caregivers, and patients do not see the words “phthalate-free” on the label of a personal care product, they may wish to buy a fragrance-free version, when a choice exists.
- Reduce use of plastic food and beverage containers and plastic or vinyl toys with the number 3 in the recycling triangle. They contain phthalates.



BPA

- Parents, caregivers, and patients can reduce their use of plastic food and beverage containers with the number 7 in the recycling triangle. They often contain BPA. Instead, they can use glass food and beverage containers, including baby bottles.
- If you use plastic baby bottles, use those that do not contain the number 7 in the recycling triangle, or use glass bottles instead.
- Microwave food in glass containers.
- Add fresh or frozen fruits and vegetables to family meals, instead of using canned foods.
- Wash hands after handling cash register receipts or ask to receive receipts by e-mail, if possible. Recent studies have found BPA in some cash register receipts. The NIEHS and the National Toxicology Program have initiated studies on exposure via cash register receipts.



To learn more about environmental exposures and breast cancer risk, download a monograph for health professionals and/or patient education materials at www.info.bcerp.org.

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