

Fact Sheet: The Puberty Connection



Early Puberty and Breast Cancer Risk

- Girls who enter puberty early may be at a greater risk for developing breast cancer later in life.¹
 - In girls, puberty includes a growth spurt, development of breasts and hips, growth of body hair, and the beginning of menstruation (having periods).
- While the timing of puberty is different for every child, overall, girls' bodies have begun to show signs of entering puberty earlier now than in the recent past.²
 - This change has been linked to environmental factors including increases in total calories, consumption of fast foods, and decreases in physical activity as well as greater exposures to endocrine disrupting chemicals.³
 - For the purposes of this fact sheet, "environmental factors" include the air we breathe, the food we eat, the water we drink, and things we touch and put on our skin.
- Beginning to have menstrual periods earlier increases the number of years the breast tissue is exposed to estrogen. Being exposed to estrogen over a long time may increase the risk of breast cancer.⁴

Possible Causes for Earlier First Periods

- Studies have demonstrated that a girl who is overweight or obese is more likely to develop breasts and get her period at an earlier age.¹
 - Obesity rates have nearly tripled among youth over the past three decades.⁵
 - Today, about one in three children in the United States is considered overweight or obese.⁴
- Studies in animals are helping scientists learn more about the causes of early maturation and breast cancer. Findings from animal studies often provide the first clues and, while more definitive research in humans is conducted, people may want to do things that might help reduce their disease risk, especially if these changes will not cause any harm.
 - Studies conducted in laboratory animals suggest that high fat diets may cause the animals to mature earlier than animals fed a standard diet.⁶⁻⁷

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- Endocrine disrupting chemicals produce harmful effects in laboratory animals, wildlife, and humans, and may interfere with the normal action of the body's hormones.⁷⁸
 - Endocrine disruptors are substances that may mimic or interfere with the function of hormones in the body.
 - Endocrine disruptors may turn on, shut off, or modify signals that hormones carry, which may affect the normal functions of tissues and organs.
- 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.³
- Animal studies have shown that maternal exposure to bisphenol A (BPA) while breastfeeding can increase mammary cancer susceptibility of the female offspring.⁸⁹
- Animal studies have suggested that maternal exposure to phthalates may be related to less regulation of cell division in the mammary glands of female offspring.⁹¹⁰

Reducing Risk

- Both healthy eating and being active can help people maintain a healthy weight and body fat level, and may help to reduce the risk of developing breast cancer later in life.¹⁰¹
- Pregnant and breastfeeding women may want to limit their own exposure to endocrine disrupting chemicals such as BPA and phthalates whenever possible, since it may be passed on to a developing or breastfeeding baby.
- Parents and caregivers can reduce girls' exposure to endocrine disrupting chemicals such as BPA and phthalates.
 - Reduce the use of plastic food and drink containers, and plastic or vinyl toys, with the number 3 in the recycling triangle. They contain phthalates.
 - Reduce the use of plastic food and drink containers with the number 7 in the recycling triangle. They often contain BPA.



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

¹ Claudio, L. (2007). Centered on Breast Cancer. *Environmental Health Perspectives*, 115 (3), A132-133.

² Euling, S. Y., Herman-Giddens, M. E., Lee, P. A., Selevan, S. G., Juul, A., Sorensen, T. I. A., . . . Swan, S. H. (2008). Examination of US puberty-timing data from 1940 to 1994 for secular trends: Panel findings. *Pediatrics*, 121(Supplement 3), S172-S191. doi: 10.1542/peds.2007-1813D

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- ⁴ National Cancer Institute. (2012, August 10). *Breast Cancer Prevention*. Retrieved September 21, 2012, from the National Cancer Institute Web site: <http://cancer.gov/cancertopics/pdq/prevention/breast/Patient/page3#Keypoint5>
- ⁵ Barlow, S. E., & The Expert Committee. (2007). Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity: Summary Report. *Pediatrics*, 120 (Supplement 4), S164-S192.
- ⁶ Medvedovic, M., Gear, R., Freudenberg, J., Schneider, J., Bornschein, R., Yan, M., et al. (2009). Influence of fatty acid diets on gene expression in rat mammary epithelial cells. *Physiological Genomics*, 38, 80-88.
- ⁷ [Olson L.K., Tan Y., Zhao Y., Aupperlee M.D., & Haslam S.Z. \(2010\) Pubertal exposure to high fat diet causes mouse strain-dependent alterations in mammary gland development and estrogen responsiveness. *International Journal of Obesity*, 34\(9\), 1415–1426. doi: 10.1038/ijo.2010.51](#)
- ⁸⁷ 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>
- ⁹⁸ Jenkins, S., Raghuraman, N., Eltoum, I., Carpenter, D., Russo, J., & Lamartiniere, C. (2009). Oral exposure to bisphenol A increases dimethylbenzanthracene-induced mammary cancer in rats. *Environmental Health Perspectives*, 117 (6), 910-915.
- ⁹¹⁰ Moral, R., Wang, R., Russo, I., Mailo, D., Balogh, G., Lamartiniere, C., et al. (2007). The plasticizer butyl benzyl phthalate induces genomic changes in rat mammary gland after neonatal/prepubertal exposure. *BMC Genomics*, 8, 453.
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Made possible by the Breast Cancer and the Environment Research Program (BCERP) grants U01 ES012770, U01 ES012771, U01 ES012800, U01 ES012801, U01 ES019453, U01 ES019435, U01 ES019454, U01 ES019457, U01 ES019471, U01 ES019466, U01 ES019434, U01 ES019480, U01 ES019482, U01 ES019459, U01 ES019472, and U01 ES019458 from the National Institute of Environmental Health Sciences (NIEHS) and the National Cancer Institute (NCI), NIH, DHHS.