Toxic Effects of the Easily Avoidable Phthalates and Parabens
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**Note: phthalates are associated with nailpolish, hairsprays, and Parabens**

Methyl-, ethyl-, propyl-, butyl-, and benzyl parabens, all esters of p-hydroxybenzoic acid, are widely used as antimicrobial preservatives in cosmetics, pharmaceuticals, food, and beverages. Because of their low cost and low toxicity, they are used commonly throughout the world. Once in the bloodstream they can be conjugated in the liver with glycine, sulfate, or glucuronate for excretion in the urine. But, they are also lipophilic and can be absorbed through the skin and are found intact in tissue. In fact, these compounds have been found in breast cancer tissue in levels ranging from 20 ng/g tissue to 100 ng/g tissue.33 Urinary levels of the parabens (ng/mL) from 100 U.S. residents are provided in Table 4.34.

Parabens have weak estrogenic activity and have been shown to induce the growth of MCF-7 human breast cancer cells in vitro,35 leading some researchers to suggest their potential as initiators or promoters of breast cancer. Part of the concern stems from the fact that an increasing number of breast cancers are occurring in the upper outer quadrant of the breast, where paraben-containing antiperspirant application occurs.36 Others debate that the estrogenic effect is too weak to cause problems.37 The current consensus is that parabens’ effect on health, including cancer risk, is due to much more than estrogen mimicry. An alternative mechanism by which parabens can indirectly affect estrogen levels is via inhibition of sulfotransferase activity inside the cytosol of human skin cells. By blocking sulfotransferases, the estrogen levels can remain higher than normal.38 If this same action occurs in breast tissue, then these compounds may indeed be linked to increased rates of breast cancer.

Methyl- and propyl parabens, the two most commonly found, are also potent inhibitors of mitochondrial function.39,40 This action alone would make them unwanted xenobiotics, especially for anyone with mitochondrial dysfunction-related health problems. This effect on mitochondrial function has been proposed as a mechanism for their possible role in male infertility.41

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