CEHC FACT SHEETS: Endocrine Disrupters

What are endocrine disruptors?
Hormones are chemical messengers that are produced by endocrine glands in the body such as the pituitary, the thyroid, the adrenal glands, the ovaries, and the testes. They circulate throughout the body and control metabolism, growth, development, and some aspects of human behavior. Evidence is increasing that some synthetic chemicals in the environment can interfere with hormone function. They can do this by blocking the effects of a natural hormone, by mimicking a natural hormone, or by directly interfering with the endocrine glands. Chemicals that have this capability are called endocrine disruptors (EDs). These substances have been shown to be able to alter the function of estrogen, androgen, thyroid hormone, and even the hormones of the pituitary gland.

Certain insecticides, herbicides, fumigants, and fungicides as well as industrial chemicals such as detergents, resins, and plasticizers are among the kinds of chemicals that are proven or suspected endocrine disruptors. Some of these substances have been banned in the U.S. at least in part because of their ability to interfere with the endocrine system. These banned substances include the insecticide DDT, DES (diethylstilbestrol), a synthetic estrogen prescribed in the 1950s and 1960s to prevent miscarriage, and PCBs (polychlorinated biphenyls), electrical insulating chemicals that are highly persistent in the environment and accumulate in the fatty tissue of animals. It is unknown how many endocrine disruptors are currently in use because most industrial chemicals have not been tested for their ability to interfere with the endocrine system.

How does exposure to endocrine disruptors occur?
Humans may be exposed to endocrine disruptors through inhalation, through the skin, or through food and water. People can come into direct contact with endocrine disruptors in the workplace or at home. Air can be a source of exposure. Humans may ingest endocrine disruptors through food and through breast milk. Endocrine disruptors can persist in sediments for years and can contaminate areas far removed from the source of contamination. Because so little is known about the endocrine disruption potential of most chemicals, it is difficult to determine exposure patterns in humans.

What are the health effects and symptoms of exposure to endocrine disruptors?
While human exposure to these substances is ongoing, fundamental questions about their effects have yet to be answered. Endocrine disruptors have been linked to significant declines in some wildlife populations, such as fish and birds of the Great Lakes region and alligators of Lake Apopka, Florida. They have been linked to a wide range of abnormalities in wildlife and laboratory animals, such as thinned eggshells, abnormalities of the reproductive tract, and suppression of the immune system.

Far less is known about the effects of endocrine disruptors in humans. Understanding the possible effects on human health of toxic environmental exposures is difficult for several reasons: 1) Humans are potentially exposed to thousands of chemicals in the environment, most of which have not been screened for their ability to disrupt the endocrine system; 2) Humans are exposed to mixtures of substances, and the possible cumulative effects of these mixtures have yet to be determined; and 3)
Human health outcomes may be subtle, unreported, or delayed.

Despite these uncertainties, endocrine disruptors have been suspected of contributing to a range of adverse health effects in humans, including reproductive and developmental disorders, learning problems, and immune system dysfunction. Several recent trends in human health may be related to endocrine disruptors in the environment: widespread occurrence of neurobehavioral dysfunction at birth and in childhood; an increasing incidence of testicular cancer in young men; an increasing incidence of congenital malformations of the male reproductive tract; the increasing incidence of breast cancer; and declining sperm counts.

Exposure to endocrine disruptors during pregnancy may have significant health risks because of the particular vulnerability of developing organ systems. Disturbances of the early course of human development could lead to lifelong alteration of behavior or endocrine function.

**How is exposure to endocrine disrupted diagnosed?**

All humans are exposed to endocrine disrupting chemicals. Each of us has a "body burden" of a mixture of numerous industrial chemicals and heavy metals in our tissues, blood, fat, sperm, breast milk, and amniotic fluid. The best known of these contaminants is lead. Others include pesticide residues (DDT and DDE), dioxins, and PCBs. With the exception of lead, we do not know the significance of the chemical exposures indicated by these body burdens.

**How is exposure to endocrine disruptors treated?**

There is no treatment for exposure to endocrine disrupters. Most importantly is to limit sources of known exposures to EDs.

**How can exposure to endocrine disruptors be diagnosed?**

- Avoid using pesticides in your home or yard, or on your pet -- use integrated pest management.
- Find out if pesticides are used in your child's school or day care center and campaign for non-toxic alternatives.
- If you eat fish from lakes, rivers, or bays, check with your state to see if they are contaminated.
- Avoid heating food in plastic containers, or storing fatty foods in plastic containers or plastic wrap.
- Research the ingredients of your children’s plastic toys, teething rings and baby bottles to ensure they are using the safest products.
- Support efforts to get strong government regulation of and increased research on endocrine disrupting chemicals.