



Institute for Women's Health Research

Putting Women's Health First

April 2011

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Dear Friends,

This edition of our monthly e-newsletter focuses on the environment in recognition of Earth Day 2011, which falls on April 22. The first Earth Day was celebrated in 1970 by 20 million people across America and has evolved into a worldwide campaign to learn more about protecting the environment and changes in the environment that impact our health and well being.

The environment is everything around you, indoors or outdoors--the air you breathe, the water you drink, the ground you walk on, and the food you eat. These factors affect us all, but our focus is on women. We hope you learn something new and celebrate Earth Day by joining a rally, changing to more efficient light bulbs, or going organic in your garden.

As always, we invite your comments on this topic and ideas about other women's health issues that are important to you (instwhr@northwestern.edu).

Happy Spring!

The Institute Staff



INSTITUTE FOR
WOMEN'S HEALTH
RESEARCH™

AT NORTHWESTERN UNIVERSITY

THE ENVIRONMENT AND WOMEN'S HEALTH

Chemicals and other substances that pollute the

environment can also cause serious health problems in women, such as cancer, lung disease, or reproductive system problems. They can also make health conditions worse. Scientists are studying the ways toxins in the environment may play a role in conditions such as breast cancer, endometriosis, and menopause.



COMMON SOURCES OF ENVIRONMENTAL TOXINS

Outdoor air pollution affects everyone but especially children whose lungs are still developing and adults with lung conditions. Ground level ozone and particle pollution are two of the most common pollutants and pose the greatest threat to human health in the U.S. These are monitored by the EPA and reported publicly. When the levels of pollution are high, you can protect yourself and your family by limiting outdoor physical activity because it makes you take faster, deeper breaths, inhaling more pollutants into your lungs.

Acid rain is a term used to describe rain, snow, fog, dry gases, and particles containing acids. Sulfur dioxide and nitrogen oxides released by power plants, cars, and other machinery are the primary cause of acid rain. Acid rain harms plants, animals, fish, and building surfaces. It does not directly affect human health, but the main components of acid rain--sulfur dioxide and nitrogen oxides--do. These gases contribute to particulate pollution, which can affect the heart and lungs.

Indoor air pollution can affect you immediately and can cause headaches, dizziness, or sudden fatigue. Sources of indoor pollution include gases from burning fuel for heating and cooking, smoke from tobacco, building materials (asbestos insulation, pressed woods), radon, household chemicals used for cleaning and decorating, certain beauty products (nail polish, hair spray), and biological contaminants such as mold and pet dander. Well-ventilated homes reduce the effect of these products. Air cleaners may also be helpful.

Workplace pollutants are of particular concern to employees who work with chemicals or substances that are hazardous to health. This includes people who work in laboratories and handle chemicals and radioactive equipment and substances. For more information on workplace safety, visit [Occupational Safety and Health Administration](#).

Water contamination can be found in tap water, well water and even bottled water and includes bacteria, parasites, minerals, radiation, pesticides and volatile organic compounds (VOCs) that are often found in household products like paint, cleaners, adhesives, and building materials. The EPA does not regulate well water but it does monitor tap water. If you have well water, it should be tested annually and information is available from the [EPA](#). Bottled water is required to meet the same standards as tap water and is not necessarily safer than tap water. If you have a weakened immune system, check to see if your bottled or tap water is treated in one of four acceptable ways: distillation, reverse osmosis, UV light, or micron filtration with a filter whose holes are smaller than one micron.

Pesticides are chemicals used to kill pests such as insects, rodents, weeds, mold and bacteria and while helpful could also be harmful to your health. Health effects will depend on the type of pesticide, the amount of exposure and frequency of use. The health effects may take years to show up and include birth defects, nerve damage and

cancer.

ENDOCRINE DISRUPTORS

There is increasing evidence that some toxic substances harm the body by disrupting the endocrine system. The body's endocrine (or hormone) system is made up of several organs and glands (e.g., ovaries, testes, pancreas, thyroid, pituitary, adrenals); the hormones made by these tissues that are released throughout the body; and the receptors in various organs and tissues that recognize and respond to these traveling hormones. The hormones interact with cells that have receptors on their surface and connect almost like a lock and key. There are over 50 different hormones (keys) and they each have to find a compatible "lock" in order to bind to a cell enabling a particular event to occur. The endocrine system regulates biological processes from conception to old age and includes processes like brain and reproductive development, metabolism rates and the glucose cycle.

Endocrine disruptors are naturally occurring compounds or man-made substances that mimic or interfere with the function of hormones in the body. They can turn on, turn off, or modify signals that hormones carry, which may interfere with the normal functions of tissues and organs. Because a woman goes through several hormonally-influenced changes in her body across the lifespan, she is at greater risk of experiencing a number of health problems related to endocrine disruptors.

A key impetus to study endocrine disruptors started with the tragic effects of the drug diethylstilbestrol (DES) that was used from the 1940's up until the 1970's. DES was used to treat women at risk for miscarriages, though there was little evidence that it worked. As it turned out, DES-treated mothers gave birth to daughters who developed vaginal cancer and both sons and daughters with reproductive abnormalities. Using DES-exposed animal models, scientists were able to replicate these disorders and were able to study the mechanism involved in DES toxic effects. This experience taught us that hormone disruptors during fetal development can affect the child even if the mother was not harmed; that the impact of hormone disruptors is particularly high during the prenatal period; and that sometimes it takes decades or a generation before the harm of exposure becomes apparent.

Endocrine disruption can also have benefits. Some chemicals mimic a natural hormone, fooling the body into over producing or under producing a hormone (e.g. to manage an over or underactive thyroid). Certain chemicals are used to purposely cause an effect (e.g. contraceptive pills to prevent pregnancy). On the other hand, many chemicals in the environment may cause an unwanted effect and be harmful to one's health immediately or over time.

Suspected endocrine disruptors that cause harm include chemicals that we find in plastics, detergents, flame retardants, building materials, food, toys, cosmetics and pesticides. They can come into contact with the body through the air, food and beverages, and chemicals that we may use in the home and garden. It is very difficult to study the direct cause and effect of these interactions because they are influenced by dosage, concentration, timing of exposure, and an individual's specific genetic profile and health status. However, studies ongoing in animals and humans have demonstrated that certain chemicals can throw off the balance between hormones and their receptors that are necessary for certain biological processes. Scientists are just beginning to understand the long-term effects of these actions.

ENDOCRINE DISRUPTOR CHEMICALS

Besides DES, some common chemicals that are known hormone disruptors are dioxin

Besides DDT, some common chemicals that are known hormone disruptors are dioxin, PCBs (polychlorinated biphenyls-banned in 1976), pesticides (atrazine, heptachlor, DDT), heavy metals (cadmium, arsenic, mercury, lead), phthalates (plastics, cosmetics), and BPA (bisphenol A-used in plastics, lining of canned goods).

IMPACT OF HORMONE DISRUPTORS ON HEALTH

The report, *Girl Disrupted: Hormone Disruptors and Women's Reproductive Health*, produced by the Collaborative on Health and the Environment (CHE) in January 2009, lists some of the female reproductive health problems that are associated with hormone disruption. They include early puberty, impaired fertility, miscarriage, preeclampsia, preterm delivery, menstrual irregularities, polycystic ovarian syndrome, uterine fibroids, endometriosis, breast cancer, and early menopause. While much of the research has focused on reproductive hormones like estrogen, progesterone, and testosterone, we know that other hormones are susceptible to disruptors. For example, thyroid hormone imbalances can influence neurological and developmental deficits, including learning disabilities.

CONCERNS FOR OLDER WOMEN

Pollutants in the environment can contribute to some illnesses that are more common in older adults. Indoor and outdoor air pollution can aggravate the symptoms of lung and cardiovascular diseases, including high blood pressure, chronic obstructive pulmonary disease, and asthma. These conditions are more common in women over the age of 50 than in men over 50.

Older adults who are exposed to pollutants over the course of a lifetime may manifest the results of long-time exposure to chemical toxins and pesticides in the form of cancer or dementia. Lead is a toxic metal that may be stored in bones. In postmenopausal women who were exposed to lead early in life, bone loss can release lead into the bloodstream. This may cause kidney damage, increase the risk of high blood pressure, and decrease cognitive functions.

Sources:

[Girl Disrupted: Hormone Disruptors and Women's Reproductive Health](#). Report produced by the Collaborative on Health and the Environment (CHE). January 2009.

[Endocrine Disruptors Fact Sheet](#). National Institute of Environmental Health Sciences. May 2010.

[The Environment and Women's Health](#). Frequently Asked Questions.

[What are Endocrine Disruptors?](#) US Environmental Protection Agency. April 2010.

UPCOMING EVENTS

April 19, 2011

[Institute for Women's Health Research Monthly Forum: Generations at Risk? Reproductive Health and the Environment](#)
Northwestern Memorial Hospital, Chicago, Illinois

April 5, 2011 - April 8, 2011

[Global Health Week 2011: Northwestern in the World](#)
Northwestern Campus, Chicago, Illinois

April 14, 2011

[Women's Heart Health: Vascular Disease in Women](#)
Prentice Women's Hospital, Chicago, Illinois

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HEALTH TIP: FOOD STORAGE

Plastics used for food storage usually have a number code on the bottom in the middle of the recycle triangle. The safest plastics have the numbers 1, 2, 4 or 5.



#3 products have polyvinyl chloride (PVC) which is found in many containers and plastic wrap and is very toxic.

#6 is found on styrofoam products and food should never be stored in these products which can release styrene.

#7 is found on polycarbonate plastic that will release bisphenol A. It is often found in sports bottles, baby bottles, and 5-gallon water bottles.

Avoid heating food in plastic containers or with plastic wrap that has PVC (there is wrap that is PVC-free).

Plastics labeled #1 PETE, #2HDPE, #4LDPE or #5PP have the lowest health risks.

To be safe, store and heat food in glass, ceramic or stainless steel containers.

[Illinois Women's Health Registry News](#)

If you haven't already, don't forget to join the Illinois Women's Health Registry! Now in its 4th year, the Registry has nearly 6,000 participants! The Registry is a great way to get a snapshot of your own health, and get connected to cutting edge researchers who are investigating health problems that are pertinent to YOU! Join, or get more information, at <https://whr.northwestern.edu/>.

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