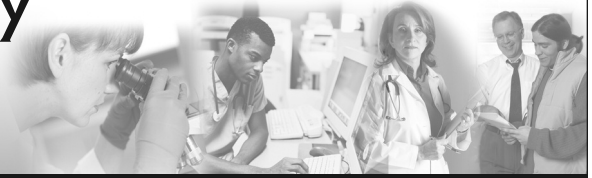


CAUT Health and Safety Fact Sheet



Endocrine Disruptors Fact Sheet

ISSUE 32

In November of 2012, a startling study¹ was released by a group of researchers from Canada, the USA and the UK that linked breast cancers in female workers to exposure to both carcinogenic and endocrine disrupting chemicals (EDCs) in over 40 Windsor plastic auto parts plants. Breast cancer rates among plastics workers were almost five times higher than women in the control group. EDC's were also affecting women in the gaming, agriculture, gaming, canning, and other manufacturing workplace. It also became worryingly clear that the public at large in the Essex and Kent county regions could also be affected from exposure to contaminated soil and air from released industrial chemicals and pesticides. In particular, premenopausal exposure and farm work prior to manufacturing work increased the risk of exposure.

The National Institute of Environmental Health Sciences (NIEHS) defines endocrine disruptors as "...naturally occurring compounds or man-made substances that may mimic or interfere with the function of hormones in the body."² This emerging health and safety hazard is present not only in the workplace but in the communities in which we live. Some drugs, dioxins, pesticides, cosmetics, plastics used in medical devices and even natural occurring phytoestrogens in plants contain endocrine disruptors. Many synthetic compounds are environmental and persistent organic pollutants (POPs) that are toxic and remain in wildlife, domestic animals and humans for extraordinarily long periods of time – long enough to cause serious illness and death.

There is still much research to be done regarding the hazards and effects of endocrine exposure.

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The World Health Organization (WHO) defines EDCs as “Exogenous substance or mixture that alters the function(s) of the hormonal system and consequently causes adverse effects in an intact *organism*, or its *progeny* or its *sub-population*,” and notes that “Human exposure to EDCs occurs via ingestion of food, dust and water, via inhalation of gases and particles in the air and through the skin. EDCs can also be transferred from the pregnant woman to the developing fetus or child through the placenta or breast milk. ...Research also shows that it may increase the susceptibility to non-communicable diseases.”³

Effect on the body

WHO’s training document for the health sector “Developmental & Environmental Origins of Adult Disease”⁴ notes that a mother’s exposure to chemicals and toxicants can impact on embryo, fetus and infant development. “Exposure to environmental pollutants inhaled, or introduced with food by the mother during pregnancy, may disrupt the epigenetic setting of embryo and foetus cells....opening the way to....neuro-endocrine diseases that may occur years/decades later, in adulthood.Epigenetic changes are changes in gene function and expression that could be passed on to the next generation, but are not explained by changes in chromosomal system or DNA sequence.”

The National Network on Environmental and Women’s Health (NNEWH)⁵ notes that synthetic chemicals and pharmaceuticals

Where are they found?

Cosmetics, cleaning compounds, baby and children’s toys, food storage containers, furniture, carpets, phones and appliances; plastics and resins in cars, trucks, planes, trains, sporting goods, outdoor and medical equipment, dental sealants and pharmaceuticals.



contain precipitators than can lead to disrupting the endocrine system. Mimicking hormones, act as a “key” to receptor “locks” and trick cells into thinking they are hormones. They can also bind to proteins that transport hormones, and can inhibit or induce enzymes which interfere with cells and modify the way genes are read.

Drugs like diethylstilbestrol (DES), dioxin and dioxin-like compounds, and polychlorinated biphenyls (PCBs), pesticides, polyvinyl chloride

(PVC), as well as products like cosmetics are known to contain EDC’s that have an impact on human health.

On-going research is identifying that low dose exposure⁶ over extended periods of time is proving just as hazardous as high levels over short periods of time. Work processes and environments should be carefully assessed and analyzed for endocrine exposure with an action plan to eliminate, substitute or reduce the use of and/or exposure to endocrines in the workplace. Work with your academic association Joint Health & Safety

Committee members to identify endocrine exposure, remediation, and an effective prevention plan.

Disruptors in the body

Endocrine disruptors affect or disrupt four main systems in the body:

- reproductive
- neurological
- immune
- developmental

While the research on the effects of EDC's specific to human health is relatively new, it is quickly confirming the results of environmental research on humans and other species.

Karen Kidd, Canada Research Chair at the University of New Brunswick's Biology Department noted, "Municipal wastewaters contain a number of chemicals that are known to affect the endocrine system of aquatic life and their ability to reproduce. These chemicals include detergents, antimicrobial chemicals, flame retardants, plasticizers and hormones. More specifically, women excrete natural and synthetic estrogens that are not completely broken down during most wastewater treatment and are found downstream of sewage discharges. Male fish take up these estrogens from the water and become feminized (i.e. produce egg proteins and eggs). ...Through a whole-lake experiment at the Experimental Lakes Area in northwestern Ontario, researchers showed that continuous inputs of environmentally-relevant concentrations of the synthetic estrogen used in the birth control pill caused the male fish to become feminized and the populations of

a small fish, the fathead minnow, to almost go extinct after two years. This was the first study to show that estrogens in surface waters can affect the abundance of fish. ..."

Canada's Chemical Management Plan (CMP)

This joint initiative between Health Canada and Environment Canada was launched in December 2006. Its purpose is to improve protection against hazardous chemicals and ensure their proper management through a number of proactive measures. The CMP focuses on the Domestic Substances List (DSL), including substances used commercially prior to 1987 that did not have a health or environmental assessment.

CMP mandates evaluating low, medium and high priority substances chemicals by sector to determine if they meet the three criteria of toxicity under Section 64 of CEPA⁷ and determine whether they should be added to Schedule 1 to place restrictions ("risk management measures") on the chemical, but does not actually require the government to take any action once it is placed on the list. The substance could be found "CEPA-toxic" if industry did not show otherwise.

The CMP has a Ministerial Challenge ("The Challenge") program which asks chemical manufacturers, importers and industrial users to provide new information on properties, uses, releases and management of 200 high priority chemicals that present a high probability of exposure. A number of independent bodies and non-governmental organizations are

indicating that the CMP and The Challenge are weak and insufficient to adequately evaluate, and apply proper precautions for assessments and management proposals. To date, few substances have been found CEPA-toxic, there is no

mandatory evidence-gathering provision and no duty for industry to conduct toxicity testing.

The NNEWH's study on Sex, Gender and Chemicals: Factoring Women into Canada's Chemicals Management Plan notes that "...the rapidly growing body of scientific evidence about risks and harms to unique groups of the population demonstrates the limitations and failings of the present day chemical regulatory system, challenging our thinking about how much information is sufficient to warrant action, how much risk is acceptable, and to whom (Cooper & Vanderlinden, 2009)."

It will always be critical for workers, their unions/associations and their Joint Health & Safety Committee (JHSC) members to differentiate between acceptable vs safe⁸, and

Eliminate,
Substitute,
Reduce

whether legislative and regulatory provisions really provide the measures of protection they appear to.

Where's the MSDS?

As with any product entering the workplace, the employer and the JHSC should ensure that a Material Safety Data Sheet (MSDS) accompanies the product and is available for scrutiny before deciding to use the product. MSDS's have a shelf-life of 3 years, and must be updated by the manufacturer every 3 years or every year if changes are made to the product. Use MSDS's with caution as they may not contain all the information you need to know.

Avoiding and Reducing Exposure

There is still much research to be done regarding the hazards and effects of endocrine exposure. Workers, their workplaces and their communities should take the Precautionary Principle⁹ approach before using products in work processes that may cause EDC exposure. The workplace JHSC should be tasked and supported by the employer in researching potential occupational disease-causing agents before they enter the workplace.

Sari Sairanen, UNIFOR's Director of Health & Safety, whose members participated in the auto plastics study in Windsor, urges workers and their unions to be proactive with regards to prevention. "As we know from years of working with asbestos and other carcinogenic substances, workplace hazards are not always immediately obvious, but that makes them no less deadly. Important

studies like this give credence to the glaring trends we see in our workplaces - it is absolutely urgent that we do not continue to wait until overwhelming evidence piles up before we take action."

The following are a few examples of how to reduce exposure to EDC's in the workplace and in the home:

- solvents and paints – use non-toxic versions
- eliminate chemical cleaners in the home and workplace
- do not heat food in plastic containers
- avoid fish rich in persistent organic pollutants and mercury
- use informed consent (ask questions and understand what you are taking) when taking medications
- make it a practice not to use substances that do not have an MSDS

References

Breast cancer risk in relation to occupations with exposure to carcinogens and endocrine disruptors: A Canadian case-control study NNEWH November 2012; Environmental Health www.ehjournal.net

Canadian Environmental Protection Act, 1999 (S.C. 1999, c. 33) www.ec.gc.ca/lcpe-cepa

Chemical Exposure and Plastics Production: Issues for Women's Health, A Review of Literature

Robert DeMatteo, December 2011

Chemical Exposures of Women Workers in the Plastics Industry with Particular Reference to Breast Cancer and Reproductive Hazards New Solutions, Vol. 22(4) 427-448, 2012; 2012, Baywood Publish Co., Inc. doi: <http://dx.doi.org/10.2190/NS.22.4.d>

Sex, Gender and Chemicals: Factoring Women into Canada's Chemicals Management Plan NNEWH, Sarah Lewis June 2011

Resources

Canadian Women's Health Network www.cwhn.ca

CAREX Canada www.carexcanada.ca

CCOHS www.ccohs.ca

CDC/NIOSH www.cdc.gov/niosh

OHCOW www.ohcow.on.ca

WHSC www.whsc.on.ca

Notes

1 Breast cancer risk in relation to occupations with exposure to carcinogens and endocrine disruptors: a Canadian case-control study, Brophy et al. Environmental Health 1012, 11:87 www.ehjournal.net/content/11/1/87

2 NIEHS Endocrine Disruptors May 2013

3 World Health Organization, Children's environmental health, Endocrine Disrupting Chemicals (EDCs) 2012 www.who.int/ceh

4 WHO Training Package for the Health Sector, Children's Health and the Environment, Developmental & Environmental Origins of Adult Disease October 2011

5 -Defining Endocrine Disruptors: Are Women Workers in the Automotive Plastics Industry Particularly at Risk? - Plastics Industry Workers and Breast Cancer Risk: Q&A www.nnewh.org

6 Chemical Exposures of Women Workers in the Plastics Industry with Particular Reference to Breast Cancer and Reproductive Cancers, NEW SOLUTIONS, Vol. 22(4) 427-448, 2012 doi: <http://dx.doi.org/10.2190/NS.22.4.d>

7 Canadian Environmental Protection Act, 1999 (S.C. 1999, c. 33) <http://laws-lois.justice.gc.ca/eng/acts/C-15.31/index.html>

8 Exposure Limits – Acceptable vs Safe Fact Sheet No. 31, CAUT www.caut.ca

9 Precautionary Principle Fact Sheet No. 21, CAUT www.caut.ca