

ISSUE 13, APRIL 2009

- Sending the wrong signals: the danger to long-term health posed by endocrine disruptors
- High bisphenol-A levels found in hospitalised premature infants
- Cleaning chemicals put nurses at up to 70% increased risk of asthma

Sending the wrong signals: the danger to long-term health posed by endocrine disruptor exposure during developmental windows

When faced with fertility problems or Alzheimer's, we don't usually think about what we were exposed to in the womb – yet this may be from where problems such as these originate.

When a foetus is developing, especially in the first trimester, undifferentiated cells are moving about, gaining function as they become limbs and organs. A precisely balanced and timed hormonal signalling system controls what grows where, when, and how. Chemical interference with this system, changing the quantities and effect of hormones and the times at which they are present, permanently alters the way organs develop.

Generally, exposure to low doses of endocrine disrupting chemicals does not cause gross abnormalities visible at birth. Instead, it interferes with programming which occurs during development, creating disease susceptibilities in later life or subtle changes in organs which increase the likelihood of occurrence of a range of conditions.

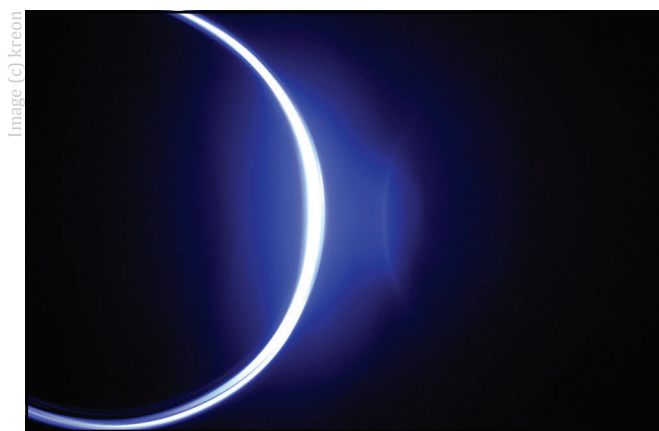
The current poster-child of hormone disruption is Bisphenol-A (BPA), routinely used in drink bottles, food tin linings and medical devices. It is of particular concern because it is so ubiquitous, acts on developing systems in so many ways, and has effects at very low levels.

MAPPING CRITICAL WINDOWS OF DEVELOPMENT

The results of in utero studies showing effects of low doses of endocrine disruptors have been mapped in a new web tool for academics and health professionals.

Created by the Endocrine Disruptor Exchange under Professor Emeritus of the University of Florida Dr Theo Colborn, the tool places peer-reviewed studies on a timeline alongside development of organs and tissues to show when and where chemicals have an effect.

- Site: www.endocrinedisruption.com
- MP3 about the tool: <http://bit.ly/TUi0>
- Review of the tool: <http://bit.ly/qYxdx>



Endocrine disruptors act like hormones, affecting health throughout life - especially during periods of development.

Equally significantly, the effects of BPA are dependent on when exposure occurs. For example, rats exposed to BPA from gestational day six to day 21 (comparable to human prenatal development from approximately week two to week 15) show delayed testicular descent as infants. If exposed to BPA after birth up to five days old, mammalian studies instead show that areas of the brain fail to develop typical gender differences and sex specific behaviours are eliminated.

The implications for public health are ominous: endocrine-related disorders such as diabetes, autism and Parkinson's disease have increased in prevalence since the 1970s. It is highly likely that the incidence of these conditions is influenced by chemical exposures in the womb. If we wait for further evidence, we are effectively making future generations part of an on-going experiment.

Many interventions are available now. For example, education and planned pregnancy can allow parents (especially mothers) to minimise exposure to many chemicals before and during pregnancy.

Ultimately, however, the burden falls on regulators to take precautions in the face of mounting evidence, to ensure phase-out of harmful chemicals in favour of less harmful alternatives. Steps are being taken but more action needs to be urged.

NEW STUDY INDICATES PLASTIC MEDICAL DEVICES ARE A SIGNIFICANT SOURCE OF BPA EXPOSURE FOR PREMATURE BABIES

Premature babies in neonatal intensive care units have been found by researchers to have levels of bisphenol-A (BPA) in their blood 10 times higher than adults. The most likely source of exposure is plastic medical devices.

The babies were grouped according to intensity of treatment with plastic devices. All the babies were found to have BPA in their urine. Those in the heavy treatment category had nine times the BPA level of babies in the low category.

The researchers also found that exposure levels varied from one hospital to the next, suggesting that different medical devices result in different degrees of exposure. The findings are consistent with recent computer modeling which predicted healthy newborns would have BPA levels 11 times that of adults.

The study only measured exposure level. The effects of exposure on the health of the babies remains unclear. However, research to identify devices safer than others could greatly reduce exposure for hospitalised infants.

- Study, published by EHP: <http://bit.ly/Algp9>
- Exposure modeling: <http://bit.ly/11kXt>
- Detailed summary at EHN: <http://bit.ly/aHVwR>

Nurses up to 70% more likely to be diagnosed with asthma

Nurses who use cleaning products and disinfectants are much more likely to develop asthma than occupations without such chemical exposures, US researchers have found.

The study of 3650 healthcare workers, including 941 nurses, revealed that cleaning instruments leads to a 67% increased chance of being diagnosed with asthma. Use of general cleaning products results in a 72% increased likelihood.

Phasing out latex gloves has contributed significantly to reducing asthma and allergic reactions in nurses. The researchers said further reductions could be made by substituting cleaning agents with safer alternatives.

In 2006, Health Care Without Harm published a detailed report on asthma in health-care, identifying the high-risk chemicals and occupations most likely to be exposed to them.

- Study in the BMJ: <http://bit.ly/IZ4EV>
- HCWH report (PDF): <http://bit.ly/7AZTD>



RECENT NEWS AND SCIENCE ABOUT THE ENVIRONMENT AND HEALTH

Rising Thyroid Cancer Incidence in the US by Demographic and Tumor Characteristics: Study finding increase in thyroid cancer rates cannot be fully explained by improvements in detection and diagnosis. <http://bit.ly/wHWuB>

Low levels of BPA raise breast cancer risk in rat offspring: For the first time, scientists have shown that low levels of bisphenol A, even below US EPA safety levels, increase breast cancer risk in rats exposed through breast milk. <http://bit.ly/IW001>

Prostate cancer as an environmental disease [Int J Oncol]: Study suggesting that environmental factors such as the intensive and prolonged exposure to pesticides may be responsible for extreme prostate cancer incidence rates in Martinique and Guadeloupe. <http://bit.ly/3vcgl>

Reducing occupational exposure to chemical carcinogens [Occupational Medicine]: Although it sets a rather low figure of 7000 deaths per year, this paper makes useful points about how many of these lives could be saved by reducing exposure to workplace carcinogens. <http://bit.ly/3vcgl>

Obesity, Diabetes and Heart Disease May Speed Dementia: Obesity and its common companions - diabetes and heart disease - can work together to speed dementia and other brain ills, a series of new studies shows. <http://bit.ly/qIOYt>

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