

OSC 10
Ohio Safety Congress & Expo

Sustainable health for the next generation – green issues facing the EHS professional
106

Dan Markiewicz, MS, CIH, CSP, CHMM
Topic: CMR chemicals

Thursday, April 1, 2010 3:30 to 4:30 p.m.

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Sustainable Health

- To most effectively prevent illness and disease we should target:
 - Before birth.
 - Major environment.
 - Controllable exposures.

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Record Births U.S.

Is this the next baby boom?

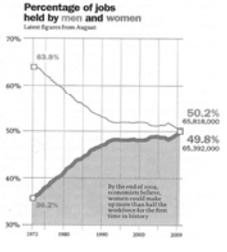


- Record 4.3 million births U.S. 2007.
- 55% of all children born in U.S. today are born to a mom who works.
- 80% of women will become pregnant during their working lifetime.

USA TODAY (Front Page) July 17, 2008.

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Majority of U.S. Workforce *



- Women will outpace number of men at work over next few years.
- Dominate growth occupations such as healthcare.
- All jobs:
 - 3:10 manufacturing
 - 1:10 construction
 - 1:25 firefighters

* Source: "The State of the American Woman" Special Report TIME (October 26, 2009)

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Children's Health Concerns.

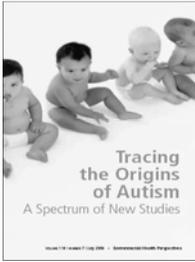
- ✓ 3-5 % major birth defects newborns.
- ✓ 8% low birth weight.
- ✓ 5-10% infertile couples.
- ✓ 17% children with a developmental disability.
- ✓ 50% unsuccessful pregnancies.
- ✓ The US ranks 30 out of 31 industrialized nations for infant mortality. *



* 2005, US beat out Slovakia for last place.

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NIH - Autism Spectrum Disorders



- July '06 NIH report
- 10-fold increase over last decade
- Paradigm shift from genetics to environmental exposures
- More than 1 million pregnant women in global studies

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Preterm Birth

- o July '06 Institute of Medicine report
- o 30% increase last 25 years
- o Highest rate among industrialized nations
- o Effects 1 in 8 live US births
- o \$26 billion per year costs in medical care and lost productivity

TABLE 6 Demographic Risk Factors Associated with Preterm Birth

Race/ethnicity
Single Marital Status
Low Socioeconomic status
Seasonality of pregnancy and birth
Maternal Age
Employment-related physical activity
Occupational exposures
Environment exposures

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Low Birth Weight

National Vital Statistics Reports

NVSS
January 7, 2009

Volume 57, Number 7

The low birthweight (LBW) rate also continued to rise, climbing to 8.3 percent in 2006, the highest level in four decades. The percentage of infants born at less than 2,500 grams has risen 19 percent since 1990. All of the rise for 2005–2006 was among moderately LBW (1,500–2,499 grams) infants. LBW rates rose slightly for Hispanic infants, but were unchanged for non-Hispanic white and non-Hispanic black infants. The LBW rate for infants born in single deliveries also increased in 2006; singleton LBW has risen 10 percent since 1990.

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The Sick Generation

Here's where the U.S. appears to be heading: children today may be the first generation of U.S. children to be less healthy than their parents.

A study released in the February 17, 2010, issue of the *Journal of the American Medical Association*, finds that the rate of chronic disease such as asthma, cystic fibrosis, diabetes, obesity, developmental disabilities, cerebral palsy and consequences of low birth weight and prematurity, among U.S. children has doubled in the last two decades. Chronic diseases now impact more than one in every two U.S. children between the ages of 8-14 years.

Source: Maternity Health Protection Report, Markiewicz, March 2010

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The Faroes Statement: Human Health Effects of Developmental Exposure to Chemicals in Our Environment

Philippe Grandjean¹, David Bellinger², Ake Bergman³, Sylvain Cordier⁴, Georg Dreyer-Smidt⁵, Brenda Ekman⁶, David Gee⁷, Kimberly Gray⁸, Mark Hansen⁹, Peter van den Hazel¹⁰, Jerrold J. Heindel¹¹, Birger Heiervang¹², Ieva Hertz-Picciotto¹³, Howard Ho¹⁴, Henry T-K Huang¹⁵, Tina Kold Jensen¹⁶, Philip J. Landrigan¹⁷, I. Caroline McMillen¹⁸, Katsuyuki Murata¹⁹, Beate Ritz²⁰, Greet Schoeters²¹, Nils Erik Skakkebaek²², Staffan Skerfving²³ and Pal Weihe²⁴

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New Studies



THE NATIONAL CHILDREN'S STUDY

HEALTH GROWTH ENVIRONMENT

WHAT IS THE NATIONAL CHILDREN'S STUDY?

The National Children's Study will examine the effects of environmental influences on the health and development of more than 100,000 children across the United States, following them from before birth until age 21. The goal of the study is to improve the health and well-being of children. [For more information click here.](#)

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NCS Locations



Map Legend

- NCS 1 Locations
- NCS 2 Locations
- NCS 3 Locations
- NCS 4 Locations
- Locations Not Available

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Toxic Release Inventory

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Managing the "Right" Side?

Source: Managing Best Practices, Industrial Safety & Hygiene News, December 2009

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Developmental Toxicant

A.7.1.3 *Adverse effects on development of the offspring* means any effect of chemicals which interferes with normal development of the conceptus either before or after birth, which is induced during pregnancy or results from parental exposure. These effects can be manifested at any point in the life span of the organism. The major manifestations of developmental toxicity include death of the developing organism, structural abnormality, altered growth and functional deficiency.

Ref. pg. 50463 OSHA HazCom Proposed Rule 9/30/09

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GHS Reproductive Toxicity

Table 3.7.3
Label elements for reproductive toxicity

Classification	Category 1A or Category 1B	Category 2	Additional criteria for placement on the label
GHS Pictograms			No pictogram
Signal Word	Danger	Warning	No signal word
Hazard Statement	H360D: May damage fertility or the unborn child. H360DF: May affect fetal development. H360FD: May cause fetal or neonatal harm. H360TF: May cause harm to the unborn child. H360TD: May cause harm to the developing fetus. H360TF: May cause harm to the unborn child.	H360D: Suspected of damaging fertility or the unborn child. H360DF: Suspected of affecting fetal development. H360FD: Suspected of causing fetal or neonatal harm. H360TF: Suspected of causing harm to the unborn child. H360TD: Suspected of causing harm to the developing fetus. H360TF: Suspected of causing harm to the unborn child.	H360D: May cause harm to breastfed children.
Precautionary Statement	P201 P202 P281	P201 P202 P281	P201 P202 P203 P204 P272
Precautionary Statement Response	P508 + P511	P508 + P511	P508 + P511
Precautionary Statement Storage	P405	P405	
Precautionary Statement Disposal	P501	P501	

Source: United Nations, 2009, GHS Annex 3, Codification of Hazard and Precautionary Statements

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E.U. – Old Approach

COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 20.11.2000
COM(2000) 466 final/2

CORRIGENDUM
Annule et remplace la page 25 du document COM(2000)466 final du 05.10.2000. L'année de la directive doit se lire 67-548 CEE au lieu de 64-548 CEE.
Concerné les versions FR, EN, et FI.

Pregnant.
 May be pregnant.
 Breastfeeding.

COMMUNICATION FROM THE COMMISSION

on the Guidelines on the assessment of the chemical, physical and biological agents and industrial processes considered hazardous for the safety or health of pregnant workers and workers who have recently given birth or are breastfeeding (Council Directive 92/85/EEC)

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OSHA - New Approach

Federal Register / Vol. 74, No. 189 / Wednesday, September 30, 2009 / Proposed Rules 50467

TABLE A.7.1—GHS-ONLY VALUES/CONCENTRATION LIMITS OF INGREDIENTS OF A MIXTURE CLASSIFIED AS REPRODUCTIVE TOXICANTS OR FOR EFFECTS ON OR VIA LACTATION THAT TRIGGER CLASSIFICATION OF THE MIXTURE

Ingredient classified as:	Cut-off values/concentration limits triggering classification of a mixture as:		Additional criteria for placement on the label
	Category 1 Reproductive Toxicant	Category 2 Reproductive Toxicant	
Category 1 reproductive toxicant	0.1%	0.1%	
Category 2 reproductive toxicant	0.1%	0.1%	
Reproductive toxicant for effects on or via lactation	0.1%	0.1%	

Part II
Department of Labor
Occupational Safety and Health
29 CFR Parts 1910, 1915, and 1926
Hazard Communication; Proposed Rule

Pregnant.
 May be pregnant.
 Breastfeeding.

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NIOSH – New Approach

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
 (Pocket Number NIOSH-100)

Request for Information on Alternative Duty Temporary Reassignment for Health Care Workers Who Work With Hazardous Drugs

AGENCY: National Institute for Occupational Safety and Health (NIOSH) of the Centers for Disease Control and Prevention (CDC), Department of Health and Human Services (HHS).

ADHOC: Notice of public comment period.

SUMMARY: NIOSH intends to publish a Current Intelligence Bulletin (CIB) on alternative duty and other forms of administrative controls for health care workers who work with hazardous drugs and are trying to conceive, are pregnant, and/or are breast feeding. A current intelligence bulletin is a document that provides information on a hazard to the worker in a similar position, but one to which they would not be required to handle hazardous drugs. Exposure to certain hazardous drugs can affect reproduction and have adverse health effects on the developing fetus. Some hazardous drugs are known

A. 101 LABORATORY, 1001A, 1010 Columbia Parkway, Cincinnati, OH 45226.

* **Personnel:** (513) 533-8285. All information received in response to this notice will be available for review.

MAILING: Director, 45226, if contact is needed. <http://www.niosh.gov>.

by request. **ADHOC:** Notice of public comment period. **ADHOC:** Notice of public comment period.

FOR FURTHER INFORMATION CONTACT: Thomas C. Gorman, P.E., NIOSH Bureau A, 101 Laboratory, 1001A, 1010 Columbia Parkway, Cincinnati, OH 45226. (513) 533-8299, email: tcgorman@cdc.gov.

SUPPLEMENTARY INFORMATION: Drugs have a medical history in treating disease and disease, and are responsible for many of our medical advances over the past century. However, virtually all drugs can have side effects associated with patient care (NIOSH 2004). In addition to risks to patients, workers who handle these are at risk of suffering these effects. In addition, it is known that exposure to even very small concentrations of chemotoxicologic and immunologic disease (NIOSH 2004). When exposed to hazardous drugs, health care workers face several health risks, including reproductive risks. A reproductive based adverse effect of women or men who have handled some chemicals, drugs, and some hazardous materials at work. These may affect fertility, or cause

It is known that these drugs have caused adverse reproductive outcomes in health care workers. For example, nurses and pharmacists exposed to hazardous drugs at their workplace reported an increase in adverse reproductive events including spontaneous abortions, stillbirths, and congenital malformations when compared with unexposed health care workers (NIOSH 2004). In addition, some drugs that negatively affect sperm cell growth and egg development (Machuga and Suckley 1996). In that March 2004, an estimated 8 million health care workers (HLS 2007) are potentially exposed to hazardous drugs at their workplace and may be vulnerable to reproductive risks. These workers include pharmacists and pharmacy technicians, nursing personnel, physicians, operating room

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OSHA HazCom - GHS

data sheets, and is trained in accordance with the provisions of HCS and paragraph (1). The employer shall ensure that at least the following hazards are addressed: Reproductive/developmental toxicity; central nervous system effects; kidney effects; blood effects; and acute toxicity effects.

(m) Signs.

(1) General.

(i) The employer shall post the following warning signs in each work area where an employees exposure to lead is above the PEL.

DANGER LEAD
MAY DAMAGE FERTILITY OR THE UNBORN CHILD
CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM!
DO NOT EAT, DRINK OR SMOKE IN THIS AREA

- Substance specific standards ... but concept will apply to a growing number of chemicals.
- 50% of costs for toxicological under EU REACH is for CMRs.
- Mostly Rs

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NOSHA - Developmental

OSHA has not set any required limits for developmental hazards i.e. hazards that may harm an unborn child because an unborn child is not an employee. For example:

- OSHA regulates worker exposure to ionizing radiation (dose limits to gonads for reproductive reasons) but the regulation is silent about risks to an unborn child.
- OSHA requires removal of employees from lead exposure when the employee's blood lead level (BLL) is at or above 60 ug/100g of whole blood. OSHA recommends that women who are pregnant limit their BLL to less than 30 ug/100g of whole blood.

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NOSHA – Not Up-to-Date

OSHA's recommendations for developmental hazards, however, are long out-of-date. Here are two examples:

- OSHA's suggested BLL for employees that may be pregnant is based on the U.S. Centers for Disease Control (CDC) recommendations from 1978. In 1991, the CDC recommended that the BLL of pregnant women not exceed 10 ug/dL (note: ug/100g = ug/dL) of whole blood, otherwise they are at risk of delivering a child with an elevated BLL that may increase the child's risk of having cognitive deficits. In 2005, the CDC issued recommendations that even 10 ug/dL may be too high.
- OSHA's website has a category for Reproductive Hazards. The most recent reference, except for a 2007 entry on lead toxicity, at OSHA's Reproductive Hazards – Hazard Recognition webpage [as of February 2010] is more than a decade old.

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NOSHA – Do Not Assume (CO)

You must not assume that any of OSHA's required exposure limits are safe for an unborn child. Consider these examples:

- Carbon monoxide (CO). OSHA's permissible exposure limit (PEL) for CO is 50 parts per million (ppm) averaged over an 8 hour workshift. The International Chemical Safety Card for CO advises that harmful effects to an unborn child are "probable" above 35 ppm averaged over an 8-hr. workshift. The World Health Organization's 2000 Air Quality Guidelines advise that pregnant women should keep their CO exposure to less than 10 ppm over 8 hours.

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NOSHA – Do Not Assume (phthalate)

- Dibutyl phthalate. In 2008, the European Union identified dibutyl phthalate as a "substance of very high concern" that may cause harm to an unborn child. Likewise, the U.S. Consumer Product Safety Improvement Act of 2008 considers dibutyl phthalate to be of high concern and the Act authorized studies to find out how the chemical gets into the body of pregnant women. OSHA's PEL for dibutyl phthalate is 5 mg/m³. The Occupational Reproductive Guideline (based upon developmental health concerns) for pregnant workers is 0.72 mg/m³.
- Noise. OSHA's noise limits for employees are measured on a dBA scale. Noise limits for women that are pregnant (to prevent hearing loss in a newborn child) should be measured on a dBC scale (155 dBC peak and 115 dBC as an 8-hr. average), according to the American Conference of Governmental Industrial Hygienists[®]. There is no direct comparison between a dBA and a dBC measurement.

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Join The Navy

REPRODUCTIVE AND DEVELOPMENTAL HAZARDS:
A GUIDE FOR OCCUPATIONAL HEALTH PROFESSIONALS



Navy and Marine Corps Public Health Center
BUREAU OF MEDICINE AND SURGERY

Navy and Marine Corps Public Health Center
Technical Manual N2ETIC-TM-OCM 6266.01 D July 2009

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Search The Stars



**NASA
Procedural
Requirements**

COMPLIANCE IS MANDATORY



NPR 1800.1C
Effective Date: October 06, 2009
Expiration Date: October 06, 2014

4.5 Reproductive and Developmental Health

4.5.1 Policy

4.5.1.1 NASA shall protect the reproductive health of all employees, students, and visitors from occupational exposures to substances (chemical, biological, radiological, or physical) known or suspected of being capable of posing a hazard to human reproduction and identify potential reproductive and developmental hazards and implement appropriate exposure control measures.

NOTE: This includes protection of the unborn. 

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End - Questions

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