

## Environmental Health Issues: Identifying Risks for Women Across the Lifespan

*March 24, 2012  
North Conway, N.H.  
20<sup>th</sup> Annual Mud Season Nursing Symposium  
Julie Hohmeister, M.S., A.P.R.N.*

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## Our Objectives

- To identify women's health issues that are associated with environmental exposures and toxins
- To identify methods to self assess for personal and occupational exposures
- To identify risk reduction strategies for you and your patients

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## A prelude to the Precautionary Principle-

- *Cowardice asks the question, "Is it safe?"*
- *Expedience asks the question, "Is it politic?"*
- *And Vanity comes along and asks the question, "Is it popular?"*
- *But Conscience asks the question, "Is it right?"*
- *And there comes a time when one must take a position that is neither safe, nor politic, nor popular, but he must do it because Conscience tells him it is right.*
  
- *- Martin Luther King, Jr.*

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## Precautionary Principle

- "When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, should bear the burden of proof. The process of applying the precautionary principle must be open, informed and democratic and must include potentially affected parties. It must also involve an examination of the full range of alternatives, including no action." –
- [Wingspread Statement](#) on the Precautionary Principle, Jan. 1998

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## Critical Issues Before Us Today:

- Fetal Origin of Chronic Illnesses
- Chemical Regulation
- Health Impacts on women's health=family health worldwide
- Environmental degradation and climate change will affect changes in human health as well as the overall biodiversity on your planet.

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## Empowering the Community

- As clinicians, and also as members of your communities, you may empower policy decisions and be a role model for change to promote public health and planetary health.
- Do not underestimate the power of your knowledge and how this can help the environment we all live in.
- Scrutinize and question decisions that may cause harm to oneself and to all others.

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“From the right to know and the duty to inquire flows the obligation to act.”

*Sandra Steingraber*

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*The causation of cancer is*

“EXTRAORDINARILY COMPLEX”

2007: ACS announces that cancer deaths are on the decline

*556,902 in 2003 to*

*553,888 in 2004*

*One half of 1% drop*

*3,014 fewer deaths*

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Evidence for increases in these cancers due to environmental exposures:

Brain cancer – primarily due to non ionizing radiation/EMF

Breast cancer- due to DDT exposures prior to puberty

Leukemia- 1,3 butadiene

Lung cancer- air pollution

NHL- pesticides and solvents

Prostate cancer- pesticides, PAH's, metal working fluids/mineral oils

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## Epigenetic Influences-

Our children's destinies may be predetermined by the chemicals we breathe, ingest, touch, and live around.

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## From the earliest exposures



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# Endocrine Disrupting: The Opening ACT




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## The Legacy of DES

- 1938-1971 approximately 10 million women and children exposed to DES
- DES Women at ~30% higher risk of breast cancer
- DES Daughters at ~ double the risk for developing breast cancer. This risk increases to 2.5 fold after age 40
- DES daughters: Increase in Adenocarcinoma, cervical disorders including cancer, prenatal complications, autoimmune disease, thyroid disruption, infertility, ectopic pregnancy, menstrual irregularities
- DES sons and possibly even third generation effects upon risk of reproductive abnormalities and reproductive cancers

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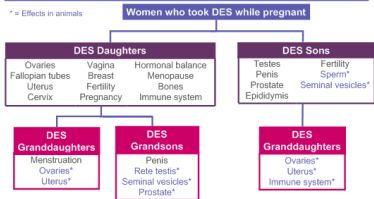
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### DES: An Example of Delayed Effects (continued)




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'Ultimately, the DES story humbles us. It serves as a reminder that though the narrow lens of today might reassure us that an intervention is safe, it is only with the wisdom of time that the full consequences of our actions are revealed.'

Annekathryn Goodman, M.D., John Schorge, M.D., and Michael F. Greene, M.D.  
10.1056/nejmp1104409 nejm.org

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## Endocrine Disruptors

- *Chemicals that alter the function of the endocrine system by mimicking or blocking the actions of hormones, altering the signaling pathways or disrupting production of hormones.*

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## Strength of Evidence-

- The Research:
- 100 independently funded studies with 90% of these finding evidence of adverse health effects with BPA.
- Every industry funded study found no such effects
- 2008: National Toxicology Program of NIH reported "some concern", that BPA harms the human brain and reproductive system

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Carnegie Mellon University: Mice exposed to low dose BPA in pregnancy have evidence of aneuploidy and chromosome damage.

According to the American Plastics Council: "low dose effects have unclear biological relevance"

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The Obesity Epidemic and Associated Health Concerns:

30% Youth are obese  
Early Sexual Maturity: 15% of American Girls reach puberty by age 7 years  
23% of African American Girls reach puberty by age 7 years  
Twice the rate as in 1997  
Associated risks of early maturity:  
Health \* Social Risks\* Increase in Cancer Risks\* Increase in Metabolic

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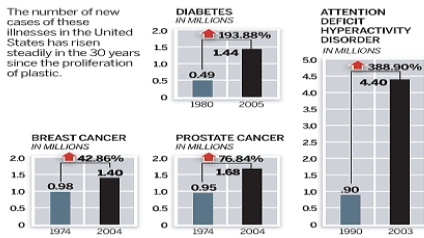
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## Endocrine Disruption and Disease

**Illnesses increase in parallel with plastics use**

The number of new cases of these illnesses in the United States has risen steadily in the 30 years since the proliferation of plastic.



Source: U. S. Centers for Disease Control and Prevention  
ALFRED ELLICERTO / [ellicerto@cornsantinel.com](mailto:ellicerto@cornsantinel.com)

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## Reproductive Disorders and EDC's

- In addition to DES causing reproductive tract anomalies and increased reproductive cancers:
- Endometriosis: TCDD (dioxin) as well as DHEP
- Precocious Puberty: DDT, p,p' DDE; BPA; phthalates
- Premature Thelarche: phthalates
- Impaired lactation: atrazine; DDE\*
- Breast abnormalities and cancer: dioxins; BPA (timing of exposures influences risk)
- PCOS: prenatal testosterone exposures
- \* dichlorodiphenyldichloroethane

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## Menstrual Health Changes

- Menstrual Irregularities: BPA; disinfection by-products; glycol ethers; pesticides; phthalates; solvents; cigarette smoke; DES; chlorinated hydrocarbons; lead;
- Uterine Fibroids: DES/ Tamoxifen

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- Canadian Health Measures Survey 2007-2009:
- Urinary BPA found in 91% of people sampled age 6-79y with children ages 6-11y with the higher concentrations.
- \_\_\_\_\_
- Conduct disorders in children ages 4-9y is associated with prenatal exposure to low molecular weight phthalates such as those found in personal care products, insect repellents, adhesives, caulking, solvents and medications.

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## Thermal Transfer of BPA



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## It is all about timing..

- Timing: *Epigenetic and Transgenerational*
- Temporal and Spatial control of gene activity without changing the actual DNA sequence
- Intrauterine exposures: may change fetal programming causing adult diseases such as diabetes, coronary risk, reproductive problems, as well as increased cancer risks.
- Low exposures may be just as critical as higher exposures

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## BPA effects can occur at very low levels of exposure

- "1000 times below the dose that the regulatory agencies presume causes no effect in humans"

Frederick vom Saal

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## It's the little things...



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## Increases in urogenital abnormalities:

- Hypospadias is estimated to have doubled since the 1970s, and now occurs in 1 of every 125 live male births in the United States.

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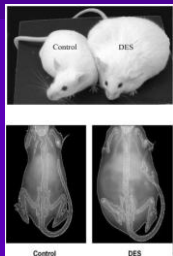
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## Rodent Studies and Obesogens

Altered expression of obesity genes and modified hormone levels, not different numbers of fat cells, but increased fat cell size following DES exposure prenatally.

BPA reduces the # of fat cells, but programs them to incorporate more fat.

BPA is related to DES



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## Pathogenetic Mechanisms of Perinatal malprogramming:

- Maternal DM or OW during pregnancy
- → Fetal &/or Early postnatal Over nutrition
- → Perinatal hyperinsulinism, hyperleptinism, hypercortisolism
- → OW & Obesity → Insulin Resistance →  $\uparrow$ BP, atherosclerosis, Glucose intolerance, CVD, Type 1,2 DM

Adapted from: Andreas Piegemann 2010 J. Perinatal Med

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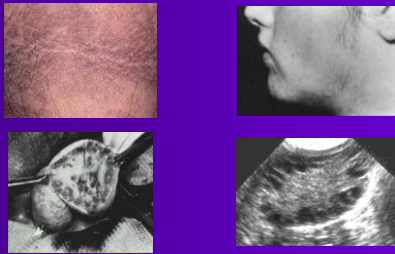
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## Polycystic Ovary Syndrome Clinical Characteristics




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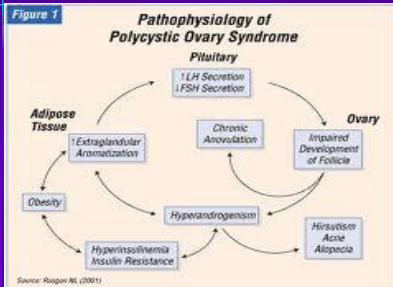
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## PCOS Endocrine Pathway




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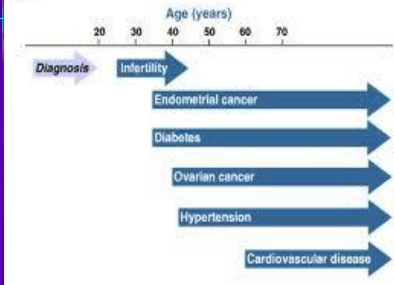
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Risk or consequences of polycystic ovary syndrome from the time of early diagnosis at less than 20 years of age throughout life.



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## Endocrine Disruptors and Chronic Disease..

- Prenatal & Postnatal exposures to environmental chemicals contributes to adipogenesis and obesity:
- BPA
- Phthalates
- Tributyltin

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## Toxics Legislation is growing...

- BPA banned by:
- European Union
- Canada
- CT, MA, MD, MN, NY, VT, WA, WI, Chicago..
- Maine just joined this group....others soon to follow
- China banned use in infant bottles/children's products

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## Corporate Interests Respond-

- New FDA Study Shows Fetuses Are Not Exposed to BPA from Mothers
- National Center for Toxicological Research Fills in Data Gaps on How BPA Is Distributed in the Body
- WASHINGTON--(BUSINESS WIRE)--The North American Metal Packaging Alliance, Inc. (NAMPA) applauds the publication of yet another government-funded and conducted study that provides reassuring evidence that bisphenol A (BPA) is not harmful to infants, children, or adults. The study -- *Distribution of bisphenol A into tissues of adult, neonatal, and fetal Sprague-Dawley rats Doerge et al. 2011* -- shows that maternal exposures to BPA are not transmitted to the fetus.

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## Corporate Responses-

- "This study emphatically demonstrates that fetuses are not at risk from BPA exposure through the diet of the mother," said Dr. John M. Rost, Chairman of NAMPA. "Essentially, the mother's body so efficiently eliminates BPA from the body that the fetus is simply not exposed to the compound. This study should reassure pregnant and nursing mothers that maintaining their current diet, including canned fruits and vegetables, does not pose a health risk to them, their developing fetus, or their nursing baby."

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did you know?  
Science Protects Our Health

The American Chemistry Council

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**NIEHS**  
National Institute of Environmental Health Sciences

### Endocrine Disrupting Chemicals

<b>HERBICIDES</b> 2,4-D 2,4,5-T Alachlor Amitro Atrazine Linuron Metribuzin Nitrofen Trifluralin  <b>FUNGICIDES</b> Benomyl Ethylene thiourea Fenarimol Hexachlorobenzene Mancozeb Maneb Metiram - complex Tri-butyl-tin Vinclozolin Zineb  <b>METALS</b>	<b>INSECTICIDES</b> Aldicarb beta-HCH Carbaryl Chlordane Chlordecone DBCP Dicofof Dieldrin DDT and metabolites Endosulfan Heptachlor / H-epoxide Lindane (gamma-HCH) Malathion Methomyl Methoxychlor Oxychlordane Parathion Synthetic pyrethroids Transnonachlor Toxaphene  Testosterone synthesis inhibitor Thyroid hormone disruptor	<b>INDUSTRIAL CHEMICALS</b> Bisphenol - A Polycarbonates Butylhydroxyanisole Cadmium Chloro- & Bromo-diphenyl Dioxins Furans Lead Manganese Methyl mercury Nonylphenol PBDEs PCBs Pentachlorophenol Penta- to Nonylphenols Perchlorate PFOA p-tert-Pentylphenol Phthalates Styrene  Estrogen receptor agonist Androgen receptor antagonist
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## Human Biomonitoring

- Virtually all pregnant women in the U.S. have detectable levels of –
- Lead
- Mercury
- Perchlorate
- BPA
- Phthalates
- Pesticides

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### 10 Canned Foods to Avoid to Reduce BPA Exposure

**Bisphenol A Facts**  
Some food cans can leach BPA into your food. BPA is a synthetic estrogen linked to breast cancer, reproductive problems, obesity, ADHD, immune system issues and other serious health issues.

The good news is that you can reduce your BPA exposure by limiting consumption of canned foods. You'll most likely want to avoid canned foods that are acidic, salty or fatty, because BPA is more likely to leach from cans that contain these ingredients.

Download this tip card for free and share it!  
[www.bornagaincancerfund.org/bpaavoid.html](http://www.bornagaincancerfund.org/bpaavoid.html)

Check it this week's food guide for more information while you're shopping. Do you know what to avoid?

**10 Canned Foods to Avoid to Reduce BPA Exposure**

☐ Coconut milk	☐ Juice
☐ Soup	☐ Fish
☐ Meat	☐ Beans
☐ Vegetables	☐ Meal-replacement drinks
☐ Meals (e.g., soups in sauce)	☐ Fruit

\*Food can leach of more than 300 pounds of BPA

Info: call 800-333-3333 or visit [www.bornagaincancerfund.org](http://www.bornagaincancerfund.org)

### Avoid These

- Coconut Milk
- Soup
- Meat in cans
- Meals in cans
- Juice
- Fish
- Beans
- Meal Replacement
- Drinks
- Fruit

#3, #6, and #7 plastics

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Think globally about the full cycle of products in our environment..



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- Polluters released a reported 4.1 billion pounds in toxic chemicals to the air, water, and soil in 2007 alone.
- • Chemicals contaminate the environment—in 2006, there were a total of 3,852 state advisories against eating fish because of chemical contamination.
- • Chemicals bioaccumulate in the food chain—more than 95 percent of human exposure to dioxin comes from food consumption

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Multiple sources of Exposure  
Phthalates



Medical



Toys



Flooring



Air Fresheners



Food containers



Personal Care Products

Center for American Progress /Reproductive Roulette Exposure to Phthalates/Reece Rushing 2009

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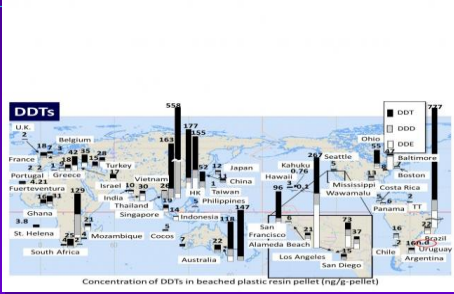
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# Plastics are Toxic Waste!




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# Marine Hazards-




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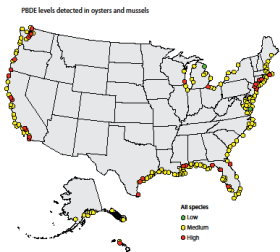
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## PBDEs are found in coastal waters and the Great Lakes

A 2008 report from the National Oceanic and Atmospheric Administration found PBDE contamination in all U.S. coastal waters and the Great Lakes. This map depicts PBDE levels found in oysters and mussels. Humans can be exposed to PBDEs by eating contaminated fish and marine life. "Scientific evidence strongly documents that these contaminants impact the food web and action is needed to reduce the threats posed to aquatic resources and human health," said John J. Durso, NOAA assistant administrator of the National Ocean Service.



48 Center for American Progress | Reproductive Justice | Part II: Dangers of chemical exposures

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## Hospital Waste



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## Oceans of Risk

- *A review of research literature from the last two decades reveals hundreds of cases in which cetaceans — an order including 80-odd species of whales, dolphins and porpoises — have been sickened or killed by marine litter.*
- *Entanglement in plastic bags and fishing gear have long been identified as a threat to sea birds, turtles and smaller cetaceans.*
- *For large ocean-dwelling mammals, however, ingestion of such refuse is also emerging as a serious cause of disability and death, experts say.*

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- *In 2008, two sperm whales stranded on the California coast were found to have a huge amount — 205 kilos (450 pounds) in one alone — of fish nets and other synthetic debris in their guts.*

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## Global Implications of Marine Toxicities

- *One of the 50-foot animals had a ruptured stomach, and the other, half-starved, had a large plug of wadded plastic blocking its digestive tract.*
- *Seven male sperm whales stranded on the Adriatic coast of southern Italy in 2009 were stuffed with half-digested squids beaks, fishing hooks, ropes and plastic objects.*

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## Bring your own bags!

- *In 2002, a dead Minke whale washed up on the Normandy coast of France had nearly a ton of plastic in its stomach, including bags from two British supermarkets.*

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## Healthy Fish Consumption Guidelines

- **For women of childbearing age (including adolescent girls):**
- Eat between 6 and 12 ounces of low-mercury, omega-3 rich fish per week. Varieties low in mercury include shrimp, canned light tuna, Pollock, salmon, and catfish. Those that have high concentrations of omega-3s include salmon, herring, and sardines

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## Fish With High Contamination Levels

Do not eat any fish high in mercury.  
Examples: swordfish, shark, king mackerel, and tilefish.

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## What the studies are showing...

- Prenatal exposures to organophosphates ( a class of pesticides) have been linked with cognitive changes in children. Based on maternal urinary levels in the upper 20% of OP metabolites, children showed a 7 point drop in full scale IQ compared with children of mothers in the lowest 20%.

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According to the EPA, the USA uses more than 1.2 billion pounds of pesticide chemicals per year. Households use about 10% of this:

- Insecticides
- Rodenticides
- Herbicides
- Pesticides

Since WWII, there has been a 20 fold increase in chemical production.

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Of the 80,000 Synthetic Chemicals now in use, only ~2% have been tested for carcinogenicity. Very few if any have been pulled by TSCA. 60,000 chemicals grandfathered in under TSCA.

Current assumption:

*Most chemicals are safe until PROVEN otherwise....*

Historically, response is very, very slow in toxic issues.

Emerging data takes years to be disclosed during which irreparable harm can be done on entire generations.

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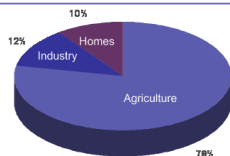
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### Pesticide Use Is Widespread in United States



More than 1.2 billion pounds used annually

Kiely T., et al. 2004.  
US EPA. 2008.

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### Sources of Pesticide Exposure (continued)

Personal uses:

- Contaminated dust in the home
- Insect repellents
- Some herbal medications
- Pets tracking in chemicals from outdoors



EPA. 2008.  
NPIC. 2008.

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Mother to child risks



Indirect Transfer and Drift

Environmental Treatments



Occupational Risks



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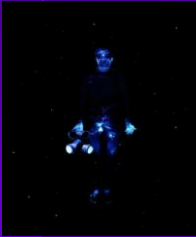
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## Farm worker Contamination



Contamination with Pesticide Residue despite protective clothing worn.

*Photo By Laurie Turner*

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## Where do we stand on breast cancer and the environment?

- Timing of exposures as well as genetics are most likely linked in the risk for breast cancer
- Environmental Tobacco Smoke (ETS) = 2<sup>nd</sup> hand smoke= strong evidence for breast and lung cancer
- Suspected link to sterilant/disinfection agent Ethylene Oxide
- Women whose husbands are exposed to chlorinated pesticides
- DDT before puberty
- DES Exposures/BPA exposures
- Dioxins (TCDD) alters breast development and increases susceptibility to mammary cancer
- Not all inclusive\*\*\*

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### Critical periods of mammary gland development

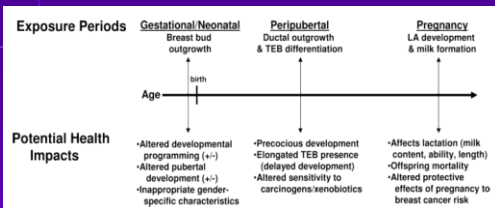


Figure 3. Timeline highlighting the critical periods of mammary gland development in rodents and the potential health impacts of chemical exposure during these developmental periods. "TEB" = terminal end bud. "LA" = Lobuloalveolar.

\* +/- = precocious or delayed (Taken from S.E. Fenton, 2006 *Endocrinology*. 147 (Supplement):S18-34.)

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### Reproduction-Related Effects (continued)

*"...every child conceived today in the Northern hemisphere is exposed to pesticides from conception throughout gestation and lactation regardless of where it is born."*

Colborn T.  
*Environ Health Perspect.* 2006

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• **Breast cancer.** Among girls born today, one in seven is expected to get breast cancer and one in 30 is expected to die from it.

Invasive female breast cancer increased an average of 1.5 percent per year between 1973 and 1996, for a total increase of 25.3 percent. Among those 65 and younger, breast cancer incidence rose 1.2 percent per year, corresponding to a doubling every two generations (58 years).

If trends continue, the granddaughters of today's young women could face a one in four chance of developing breast cancer (NCI 1996, NCI 1997).

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## The Complexity of Breast Cancer Origins

Cellular Events	
Alterations in hormone levels, metabolism or receptors	Genotoxicity
Changes in gene transcription & translation	Oxidative stress
Cell cycle changes	Invasive modulation
Peptide hormones (growth hormones)	Limitless replication potential
	Evasion of apoptosis
Tissue Changes	
Breast density	TBR proliferation
Tissue invasion	Altered mammary gland development
Sustained angiogenesis	Ductal hyperplasia
Self-sufficiency in growth	Atypical hyperplasia
Susceptibility Factors	
Obesity	Genetic polymorphisms in metabolizing enzymes
Early onset of breast development	Duration of lifetime estrogen exposure
Alterations in cyclicity	

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Table 6: What is the Connection Between Health Care Exposures and Breast Cancer?

Medical exposure	Mammary Carcinogen (IARC, 2007)	Carcinogen (IARC, 2006; NTP, 2005)	Endocrine-Disrupting Compound (Brody, 2003)	Use
Bisphenol A			●	Dental composite fillings, dental sealants, dialysis and cardiovascular bypass machines, cardiac stents and other implantable devices
Dioxin		IARC Known NTP Known	●	Byproduct of the incineration of PVC-containing medical devices
Ethylene oxide	●	IARC Known		Sterilization of surgical tools
Ionizing radiation	●	IARC Known NTP Known	●	CT scans, X-rays, mammograms
Ortho phenyl phenol		CA Prop 65	●	Disinfectants
Phthalates, especially Di(2-ethylhexyl)			●	PVC-based IV bags, IV tubing, feeding tubes, catheters
Polyvinyl chloride	●	IARC Known NTP Known		IV bags, IV tubing, feeding tubes, catheters
Triclosan			●	Microbicide

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**Some studies indicate that nursing is among the professions that have increased breast cancer incidence and mortality**

- The studies that have found a link between working as a nurse and increased breast cancer risk have found this link in the sub-specialties of pediatrics, midwifery, psychiatric, surgical, medical, geriatric and primary care nursing. Further analysis done in one of these studies found that nurses who handled cytotoxic drugs had the highest risk. As nurses, we are exposed to a wide array of cancer-causing chemicals in our workplace, including disinfectants, sterilants, cleaners, pesticides and even some hazardous drugs we work with in treating our patients.

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Study in 1976: Women with Breast Cancer had elevated levels of DDE and PCB's in their tumors.

In 1993: 14,290 women's blood samples studied for DDE/PCBs :  
Women in this group with breast cancer had 35% more DDE than women without breast cancer, but PCB levels only slightly higher.

*PCB: Polychlorinated biphenyls*

*DDE: (dichlorodiphenyldichloroethylene)*

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The Average American woman uses 12-13 personal care products daily and 6 or more cosmetics.

These products include a myriad of chemicals that individually and collectively pose unacceptable risks to our health.

At least 3 personal care products are applied to the skin of infants and children daily, perhaps several times.

Human biomonitoring studies have identified over 200 chemicals in body fluids including breast milk, cord blood, and urine.

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## Phthalate Exposures

- The published literature indicates that
- the exposure sources listed from highest to lowest are:
  - food,
  - cosmetics,
  - consumer products (other than toys), and toys.

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- Biomonitoring data from amniotic fluid and urine have demonstrated that humans are exposed to phthalates *:in utero*, as infants, during puberty, and in adult life, and that people are exposed to several phthalates at once.

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## Phthalate exposures→

- The reproductive developmental effects observed in humans include shortened anogenital distance observed in newborn boys; and shortened pregnancy, lower sex and thyroid hormones, and reduced sperm quality observed in adults.

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## Personal Care Products

- *Warning: The safety of this product has not been determined*



The FDA does not review – nor does it have the authority to regulate – what goes into cosmetics before they are marketed to salons and

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## Chemicals of Concern in:

- Hair Relaxers
- Skin Lighteners
- Dandruff Shampoo
- Hair conditioners
- Hair Dyes
- Nail Polish
- Fragrances
- Sunscreens
- Anti-Aging Products
- Liquid Hand Soaps

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## Legislation Initiatives:

- in 2005, the European Commission banned DEHP, DBP and BBP in all toys and childcare articles
- California, Vermont and Washington have established standards for the content of certain phthalates in children's articles.

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Consumer Awareness:

**USDA Organic certified**

**100% Organic:** The product must contain only organically produced food ingredients, and the label will display the USDA Organic seal.

**Organic:** The product must contain at least 95% organically produced food ingredients, and the label will display the USDA Organic seal.

**Made with Organic Ingredients:** The product must contain at least 70% organically produced food ingredients.

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Consumer Awareness:

**Organic Ingredients:** Products which contain less than 70% organically produced food ingredients can only include organic ingredients on its ingredients list, but these products cannot display the USDA Organic seal.

A good reference for information: The Environmental Working Group  
EWG.org

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Children's exposures are greater to chemicals in the environment.

Minimize skin contact, inhalation, and ingestion.

We are our daughter's and our son's first line of defense through the use of our intuitive knowledge and awareness about their immediate environments.



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## The Tobacco Toxins



Tobacco smoke contains more than 4,000 chemicals, more than 70 known or suspected carcinogens, and many potent irritants.



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Tobacco smoke includes:	As found in:
Acetone	paint stripper
Acetylene	welding torches
Arsenic	ant poison
Benzene	Napalm
Butane	lighter fuel
Cadmium	car batteries
Carbon monoxide	car exhaust fumes
DDT	insecticide
Formaldehyde	embalming fluid
Hydrogen cyanide	capital punishment by gas
Lead	old paint, leaded gasoline
Methanol	rocket fuel
Nicotine	cockroach poison
Phenol	toilet bowl disinfectant
Polonium 210	nuclear weapons
Propylene glycol	antifreeze
Toluene	industrial solvent
Vinyl chloride	plastics

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## Prenatal Smoke exposures:

- Increase initial LBW and prematurity which may cause an increase in later overweight in children and adulthood obesity.
- Increases in asthma, neurological problems, allergies, prematurity, birth defects, higher rates of infection, learning problems, reduced fertility.....

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More than 3.5 million new cases of skin cancer will be diagnosed in the United States this year, affecting 2 million people. (2011)

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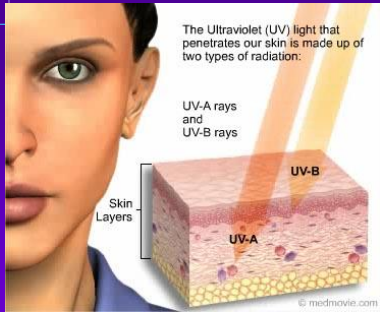
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UV-B rays penetrate top layers resulting in most sunburns.



UV-A rays penetrate more deeply. Both types can damage the skin and DNA, increasing the risk of skin cancer.

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**Seal of approval**

The Skin Cancer Foundation (SCF) lends its logo to hundreds of sun protection products. SCF approval is easy: just document that your product has an SPF of at least 15 and provide results of basic tests (for SPF, skin reactions and water and sweat resistance, if such claims are made). SCF also requires that companies pay a \$10,000 donation by to join the Foundation's "Corporate Council" in order to have their products approved.

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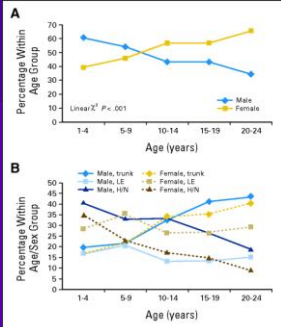
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**Fig 1.** (A) Distribution of cutaneous melanoma patients by age and sex. (B) Distribution of cutaneous melanoma patients by age, sex, and primary site. Lower extremity (LE) sex comparison: two-sided z test,  $P < .05$  for age groups 5 to 9, 10 to 14, 15 to 19, and 20 to 24 years. Head and neck (H/N) sex comparison: two-sided z test,  $P < .001$  for age groups 10 to 14, 15 to 19, and 20 to 24 years.



J. Clinical Oncology 2007 Apr25(11)

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President Richard Nixon presided over the swearing in of William D. Ruckelshaus as administrator of the new Environmental Protection Agency on Dec. 4, 1970. Photo AP/Charles Tasnadi



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*"Every civilization creates the conditions for its own diseases."*

René Dubos



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1962 "Silent Spring"

Thank you Rachel!



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*As for the future, your task is not to foresee it, but to enable it.*  
*Antoine de Saint-Exupery*

*Well, perhaps we cannot foresee everything in the future, but we can have a pretty good idea what's ahead of us if we understand there are always consequences to our choices from yesterday and today.*

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*Dedicated to a healthier tomorrow and all the children of our dreams....thank you!*



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