

How Chemical Exposures Affect Reproductive Health

Patient Fact Sheet



Chemicals Can be Hazardous to Your Reproductive and Developmental Health

Disorders that may be caused by chemical exposures include:

- ★ Infertility/Reduced fertility;
- ★ Spontaneous abortions/Miscarriages;
- ★ Structural or functional birth defects;
- ★ Chromosome damage;
- ★ Hormonal disruption;
- ★ Menstrual problems

More than 70,000 synthetic or naturally occurring chemicals are in commercial use today, yet only a fraction have been adequately examined for toxicity and for interactive effects due to multiple exposures. Even small exposures can be biologically significant (see table, reverse).

Substances of Concern

- ★ **Metals** (e.g., lead, mercury, and cadmium);
- ★ **Industrial chemicals, including solvents** (e.g., toluene, benzene, perchloroethylene, and trichloroethylene);
- ★ **Pesticides**;
- ★ **Endocrine disrupting substances** (e.g., dioxin, PCBs, some pesticides, alkylphenols, phthalates)

Where Used/Where Found

Home

Paints and varnishes;
Cleaning products;
Hobby materials;
Pesticides;
Building materials;
Home office products;
Pet care products;
Food;
Contaminated water (ingestion, skin absorption, inhalation);
Indoor air

Work

Agriculture and food preparation (pesticides);
Electronics, health care, painting, dry cleaning, and auto repair industries (solvents);
Construction, painting, welding, jewelry making (metals)

Community

Schools;
Hazardous waste sites (including landfills/military bases);
Waste incinerators;
Industrial emissions;
Dry cleaners;
Gas stations;
Farms and greenhouses

Key Points

- ❶ More than 70,000 chemicals in commercial use today; only a fraction have been adequately examined for toxicity, additive or interactive effects.
- ❷ Exposure to metals, solvents, pesticides and other industrial chemicals may cause infertility, miscarriage, birth defects, hormonal disruption, and/or chromosome damage.
- ❸ Information you bring to your health care provider on chemicals and exposures is essential to evaluation of many health problems.

Resources

- ✳ OTIS Pregnancy/Environmental Hotline—State Referrals: (716) 874-4747 x477
- ✳ Association of Occupational and Environmental Clinics: (202) 347-4976; occ-env-med.mc.duke.edu/oem/aoec.htm
- ✳ National Library of Medicine: (800)-638-8480
www.nlm.nih.gov
- ✳ Right-to-Know Network (RTKNet): (202) 234-8494;
www.rtk.net
- ✳ National Institute of Occupational Safety and Health (NIOSH): (800) 356-4674
- ✳ Greater Boston Physicians for Social Responsibility. *Generations at Risk: How Environmental Toxins May Affect Reproductive Health in Massachusetts*. Cambridge, MA. 1996: (617) 497-7440.

Going to Your Health Care Provider—Be Prepared

Most health care providers have had little training in environmental health and may be poorly prepared to answer questions about environmental exposures. You may want to seek out a specialist in occupational and environmental medicine (OEM). OEM clinics are often located at hospitals. Whether you see your regular provider or a specialist:

👉 **Bring as much information as you can on chemicals of concern.** For home or work exposures from products, try to bring the product and/or its Material Safety Data Sheet (MSDS), which you can request from the manufacturer. The MSDS should but does not always list health effects. Your provider can usually obtain unlisted trade secret information if you cannot. For a community exposure, bring information about chemicals, quantities, exposure pathways (air, land, water).

👉 **Ask your provider to seek information on health effects.** It will help if you bring other information on health effects with you. Online databases such as the National Library of Medicine are good resources.

👉 **Be prepared with your exposure history.** Try to think of any jobs throughout your life at which you may have been regularly exposed to toxic chemicals. Do the same for residences to determine potential community exposures.

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Reproductive Outcomes Associated with Chemical Exposures ♦

| <u>Chemical</u> | <u>Health Effects</u> † * | <u>Where Used/Where Found</u> |
|----------------------------------|---|--|
| Solvents | | |
| I,1,1-TCA | SA, SBD | CW, IP, WP/S |
| Benzene | C, LBW, MA, SBD, O (childhood leukemia) | CP, CW, IP, WP/S, O (gasoline) |
| Chloroform | LBW, SBD | AP, CW, CF, IP |
| Epichlorohydrin | C, MI | H/S, IP, WP/S, O (wines stored in contaminated vats) |
| Formaldehyde | MA, SA | CP, IP, O (bldg materials) |
| Glycol Ethers | FI, LBW, MI, SA, SBD | CP, H/S, IP, WP/S |
| N-Methyl-Pyrrolidone (NMP) | SA, O (stillbirth) | CP, H/S, IP, WP/S |
| Perchloroethylene (PCE) | FI, MI, SA, O (infant jaundice) | CW, IP, WP/S |
| Phenol | C, LBW, O (infant jaundice) | AP, CP, CW, IP |
| Styrene | H, MA, MI | AP, CP, CW, IP, O (fire fighting) |
| Toluene | FD, H, LBW, MI, SA, SBD | CP, CW, IP, O (cigarette smoke, gasoline) |
| Trichloroethylene (TCE) | LBW, FD, H, SA, SBD, O (childhood leukemia) | CW, IP, WP/S |
| Xylene | LBW, SA, SBD | CW, H/S, IP, WP/S, O (gasoline) |
| Metals | | |
| Arsenic | SA, SBD, FD, LBW, O (hearing loss) | CF, CW, IP, O (wood products) |
| Cadmium | FD, LBW, MI, SBD, O (lung damage, placental toxicity) | CF, CW, IP, O (cigarette smoke) |
| Lead | FD, FI, H, LBW, MI, SA, SBD | CF, CS, CW, O (paint) |
| Manganese | MI, FD, LBW | IP, P, O (gasoline) |
| Mercury (Inorganic) | MA, SA, O (acrodynia) | CP, IP, O (dental fillings) |
| Mercury (Organic) | FD, SBD | CF |
| Pesticides ‡/Insecticides | | |
| 2,4-D | C, MI, SBD | AG/P, AP, CW, HG/P |
| Atrazine | H, LBW, SA, SBD | AG/P, AP, CW, HG/P |
| Benomyl | MI, SA, SBD | AG/P, CF, HG/P |
| Bromoxynil | SBD | AG/P, CW |
| Chlorpyrifos | SBD | AG/P, AP, CF, CW, HG/P |
| Cyanazine | LBW, SA, SBD | AG/P, CW |
| Cypermethrin | FD, H, LBW | AG/P, CF |
| Diazinon | C, H, MI, SA, SBD | AG/P, AP, CF, HG/P, CW |
| Dicofol | FD, H, MI | AG/P, CF |
| Dimethoate | H, MI | AG/P, CF |
| Dithiocarbamate | FD, H, MI, SA, SBD | AG/P, CF, O (rubber, plastics) |
| Endosulfan | H, MI | AG/P, CF, HG/P |
| Ethylene Dibromide | MI | CW, WP/S, IP |
| Ethylene Oxide | C, MI, SA | IP, O (sterilizing medical equipment) |
| Lindane | H, MA, MI, SA | AG/P, AP, CF, HG/P O (body lice treatment) |
| Linuron | SA, LBW | AG/P, CW |
| Malathion | H | AG/P, AP, CF, CP, HG/P, O (flea/tick dip) |
| Metam Sodium | SBD | AG/P, AP |
| Methoxychlor | FD, FI, H, SA | AG/P, CF, HG/P |
| Methyl Bromide | MI | AG/P, IP |
| Parathion | C, FD, MI, SA | AG/P, CF |
| Propargite | O (bone developmental abnormalities) | AG/P, AP |
| Resmethrin | SA, LBW, H | AG/P, AP, HG/P |
| Vinclozolin | H, SBD | AG/P, CF |
| Other | | |
| Alkylphenols | H | CP, CF, CW, IP |
| Bisphenol-A | H, O (enlarged prostate) | CP, CF, IP, O (dental sealants) |
| Dioxin | H, FD, MI, SA, SBD, O (altered sex ratio, endometriosis in primates) | AP, CF, CS, IP |
| PCBs | H, FD, FI, LBW, MA, SA, | CF, CS, IP (banned in U.S.) |
| Phthalates | H, MI, SA, SBD | CP, CF, CW, IP |

Key

Health Effects
C = Chromosome damage
FD = Functional defects
FI = Female infertility
H = Hormonal
LBW = Low birth weight
MA = Menstrual abnormalities
MI = (Male infertility and/or spermatotoxicity)
O = Other (specified)
SA = Spontaneous abortion
SBD = Structural birth defects

Where Used/Where Found
AG/P = Agricultural Pesticide
AP = Air pollution (including incineration)
CF = Contaminated food
CP = Consumer products
CS = Contaminated soil
CW = Contaminated water
H/S = Household solvents
HG/P = Home/Garden Pesticide
IP = Industrial processes (incl. dry cleaning)
O = Other (specified)
WP/S = Workplace solvents

Notes

† Effects derived from at least two animal studies and/or human studies. Evidence is consistently found for some effects--inconsistently for others. See *Generations at Risk* (GBPSR/MASSPIRG, 1996), Table 1 (pp. 94-95).

* Absence of an effect may represent negative studies, single positive animal study, or absence of data.

♦ Table does not contain information about the level of human risk attributable to each exposure, dose-response data, or human exposure levels. Please see relevant sections of *Generations at Risk* for more detail.

‡ Pesticides listed are in common use commercially or in the home (e.g., lawn and garden products, pet applications) and are found in a variety of products, many of which are available over the counter.