Environmental Risks and Pregnancy

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There are more than 4 million chemical mixtures in homes and businesses in this country, with little information on the effects of most of them during pregnancy. However, a few are known to be harmful to an unborn baby. Most of these are found in the workplace, but certain environmental pollutants found in air and water, as well as chemicals used at home, may pose a risk during pregnancy.

A pregnant woman can inhale these chemicals, ingest them in food or drink, or, in some cases, absorb them through the skin. For most hazardous substances, a pregnant woman would have to be exposed to a large amount for a long time in order for them to harm her baby. Most workplaces have preventive measures to help make sure this doesn't happen. Pregnant women can take steps to help protect themselves and their babies from pollutants and potentially risky chemicals used at home.

What are the risks of lead exposure during pregnancy?

Lead is a naturally occurring metal that was found for many years in gasoline, paint and other products used in homes and businesses. While lead is still present in the environment, the amounts continue to decrease since the Environmental Protection Agency (EPA) banned its use in these products in the 1970s.

Lead poses health risks for everyone, but young children and unborn babies are at greatest risk. Exposure to high levels of lead during pregnancy contributes to miscarriage, preterm delivery, low birthweight and developmental delays in the infant. Lead toxicity in children is characterized by behavioral and learning problems and anemia. Few pregnant women in the United States are exposed to high levels of lead. However, even low levels of exposure may cause subtle learning and behavioral problems in the child.

Women who live in older homes may be exposed to higher levels of lead due to deteriorating lead-based paint. About 80 percent of homes built before 1978 were painted with lead-based paint. As long as paint is not crumbling or peeling, it poses little risk. However, if lead-based paint needs to be removed from a home, pregnant women and children should stay out of the home until the project is complete. Sanding or scraping leaded paint produces lead dust. Only experts should remove leaded paint, using proper precautions.

Occasionally, a pregnant woman is exposed to significant amounts of lead in her drinking water if her home has lead pipes, lead solder on copper pipes or brass faucets. Pregnant women can contact their state health department to find out how to get their pipes tested for lead. The EPA recommends running water for 30 seconds before using it for drinking or cooking to help reduce lead levels. A pregnant woman should use only water from the cold water pipe, which contains less lead than hot water, for cooking, drinking and preparing baby formula. Many home filters do not remove lead, so a pregnant woman should read the label on her filter carefully and change the filter as recommended.

Lead crystal glassware and some ceramic dishes may contain lead, and pregnant women and children should avoid frequent use of these items. Commercial ceramics are safer than those made by craftspeople. Other unexpected sources of lead in the home may include the wicks of scented candles (which release lead particles into the air when burned) and the plastic (polyvinyl chloride) grips on some hand tools.

Some arts and crafts materials (e.g., oil paints, ceramic glazes and stained glass materials) contain lead. A woman should try to stick with lead-free alternatives (such as acrylic or watercolor paints) during pregnancy and breastfeeding.

If anyone in the home is exposed to lead on the job (such as painters and those working in smelters, auto repair shops, battery manufacturing plants or certain types of construction), they should change their clothing and shower at work to avoid bringing lead into the home. They should wash contaminated clothing at work, if possible, or wash it at home separately from the rest of the family's clothing.

Does mercury exposure pose a risk in pregnancy?
Mercury is another metal that is present naturally in the environment. Pregnant women are most often exposed to mercury by eating contaminated fish. Mercury enters the environment from natural and man-made sources (such as coal-burning or other industrial pollution). It is converted by bacteria to a more dangerous form (methylmercury) that accumulates in the fatty tissues of fish. While trace amounts of mercury are present in many types of fish, mercury is most concentrated in large fish that eat other fish, such as swordfish and sharks.

In 2004, the U.S. Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) made three recommendations for women who might become pregnant, women who are pregnant and nursing mothers. By following these recommendations, women can get the benefits of eating fish and shellfish and be confident that they have reduced their exposure to the harmful effects of mercury.

1. Do not eat shark, swordfish, king mackerel, or tilefish because they contain high levels of mercury.
2. Eat up to 12 ounces (two average meals) a week of a variety of fish and shellfish that are lower in mercury. Five of the most commonly eaten fish that are low in mercury are shrimp, canned light tuna, salmon, pollock, and catfish. Another commonly eaten fish, albacore ("white") tuna, has more mercury than canned light tuna. When choosing two meals of fish and shellfish, women may eat up to 6 ounces (one average meal) of albacore tuna per week.
3. Check local advisories about the safety of fish caught by family and friends in local lakes, rivers, and coastal areas. If no advice is available, women may eat up to 6 ounces (one average meal) per week of fish caught from local waters, but they should not consume any other fish during that week.

Game fish also may be contaminated with other industrial pollutants such as PCBs (polychlorinated biphenyls); a pregnant woman's exposure to PCBs may contribute to a

child's learning problems, reduced IQ and low birthweight. Pregnant women or women who could become pregnant should not consume any game fish without checking with their state or local health department or the EPA to find out which fish are safe to eat.

It's less certain whether exposure to elemental mercury, which is used in thermometers, dental fillings and batteries, poses a risk in pregnancy. Some studies have found an increased risk of miscarriage in women working in dental offices. Women who work with mercury should take all recommended precautions to reduce their exposure.

What other metals pose a risk in pregnancy?
Arsenic and cadmium are two other metals that are suspected of posing pregnancy risks. These metals enter the environment through natural (weathering of rock and forest fires) and man-made (mining and burning of fossil fuels and waste) forces.

While arsenic is a well-known poison, the small amounts normally found in the environment are unlikely to harm a fetus. However, certain women may be exposed to higher levels of arsenic that could pose a risk. Several studies suggest that women working at or living near metal smelters may be at increased risk of miscarriage and stillbirth. Women who live in agricultural areas where arsenic fertilizers (now banned) were used on crops or who live near hazardous waste sites or incinerators also may be exposed to higher-than-normal levels of arsenic. They can help protect themselves by having their water tested for arsenic or by drinking bottled water and limiting contact with soil. Because arsenic also is used as part of a preservative in pressure-treated lumber, pregnant women should avoid wood dust from home construction projects. Anyone who works with arsenic (semiconductor manufacturing, metal smelting, herbicide application) should avoid bringing the metal home on clothing.

Scientists suspect that cadmium may pose a risk in pregnancy. One study suggests that cadmium may damage the placenta and reduce birthweight. This metal is used in many occupations, including semiconductor manufacturing, welding, soldering, ceramics and painting. Women who work with cadmium should take all recommended precautions and avoid bringing it home on clothing. Pregnant women also may want to consider eliminating sources of cadmium from the house, such as fungicides containing cadmium chloride, certain fabric dyes and ceramic and glass glazes and some fertilizers.

Can pesticides harm an unborn baby?
Pregnant women should avoid pesticides, whenever possible. There is no proof that exposure to pest-control products at levels commonly used at home pose a risk to the fetus. However, all insecticides are to some extent poisonous and some studies have suggested that high levels of exposure to pesticides may contribute to miscarriage, preterm delivery and birth defects. Certain pesticides and other chemicals, including PCBs, have weak, estrogen-like qualities called endocrine disrupters that some scientists suspect may affect development of the fetus's reproductive system.

A pregnant woman can reduce her exposure to pesticides by controlling pest problems with less toxic products such as boric acid (use the blue form available at hardware

stores). If she must have her home or property treated with pesticides, a pregnant woman should:

- Have someone else apply the chemicals and leave the area for the amount of time indicated on the package instructions.
- Remove food, dishes and utensils from the area before the pesticide is applied. Afterwards, have someone open the windows and wash off all surfaces on which food is prepared.
- Close all windows and turn off air conditioning, when pesticides are used outdoors, so fumes aren't drawn into the house.
- Wear rubber gloves when gardening to prevent skin contact with pesticides.

Health care providers also have some concerns about the use of insect repellants during pregnancy. The insect repellant DEET (diethyltoluamide) is among the most effective at keeping bugs from biting; however, its safety during pregnancy has not been fully assessed. If a pregnant woman uses DEET, she should not apply it to her skin. Instead, she should place small amounts on her socks and shoes and outer clothes, using gloves or an applicator to avoid contact with her fingers.

What are organic solvents?
Organic solvents are chemicals that dissolve other substances. Common organic solvents include alcohols, degreasers, paint thinners and varnish removers. Lacquers, silk-screening inks and paints also contain these chemicals. A 1999 Canadian study found that women who were exposed to solvents on the job during their first trimester of pregnancy were about 13 times more likely than unexposed women to have a baby with a major birth defect, like spina bifida (open spine), clubfoot, heart defects and deafness. The women in the study included factory workers, laboratory technicians, artists, graphic designers and printing industry workers.

Other studies have found that women workers in semiconductor plants exposed to high levels of solvents called glycol ethers were almost three times more likely to miscarry than unexposed women. Glycol ethers also are used in jobs that involve photography, dyes, and silk-screen printing.

Pregnant women who work with solvents, including women who do arts and crafts at home, should minimize their exposure by making sure their workplace is well ventilated and by wearing appropriate protective equipment, including gloves and a face mask. They should never eat or drink in their work area. To learn more about the chemicals she works with, a woman can ask her employer for the Material Safety Data Sheets for the products she uses or contact the National Institute for Occupational Safety and Health or visit http://www.msdssearch.com/.

Is drinking chlorinated tap water safe during pregnancy?
In recent years, media reports have raised concerns about possible pregnancy risks from by-products of chlorinated drinking water. Chlorine is added to drinking water to kill

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Department of Health and Human Services and Environmental Protection Agency. FDA and EPA announce the revised consumer advisory on methylmercury in fish, March 19, 2004.

Farley, D. Dangers of Lead Still Linger. FDA Consumer Magazine, January/February 1998.

Khattak, S., et al. Pregnancy Outcome Following Gestational Exposure to Organic Solvents: A Prospective Controlled Study. Journal of the American Medical Association, volume 281, number 12 , March 24/31, 1999, pages 1106-1109.

Lappe, M. and Chalfin, N. Identifying Toxic Risks Before and During Pregnancy: A Decision Tree Action Plan. Report to the March of Dimes, Center for Ethics and Toxics (CETOS), Gualala, CA, April 15, 2002.

Reproductive Toxicology Center. Diethyltoluamide (revised 4/1/00), Arsenic (revised 9/1/01), Cadmium (revised 5/1/01), Trihalomethanes (revised 2/1/01), Chlorine (revised 10/1/01), Chloroform (revised 6/1/01), Tapwater (revised 7/1/01); all accessed 1/23/03.

U.S. Environmental Protection Agency. Lead in Paint, Dust, and Soil. Updated 12/23/02, accessed 1/23/03.

U.S. Environmental Protection Agency Air Toxics Program. The Integrated Urban Strategy: Report to Congress. July 2000, accessed 1/24/03.

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disease-causing microbes. However, when chlorine combines with other materials in water, it forms chloroform and related chemicals called trihalomethanes. The level of these chemicals in water supplies varies. A few studies suggest that the risk of miscarriage and poor fetal growth may be increased when levels of these chemicals are high, while other studies have not found an increased risk. Scientists continue to study the safety of these chemicals during pregnancy. Until we know more, pregnant women who are concerned about chlorine may choose to drink bottled water.

Drinking water also can become contaminated with pesticides, lead or other metals. Women who suspect their water supply may be affected can have their water tested or drink bottled water.

Do household cleaning products pose a risk in pregnancy?
While some household cleansers contain solvents, there are many safe alternatives. Pregnant women should read labels carefully and avoid products (such as some oven cleaners) whose labels indicate they're toxic.

Products that contain ammonia or chlorine are unlikely to harm an unborn baby, though their odors may trigger nausea in a pregnant woman. A pregnant woman should open windows and doors wear rubber gloves when using these products. She should never mix ammonia and chlorine products because the combination produces fumes that are dangerous for anyone.

A pregnant woman who is worried about commercial cleansers or bothered by their odors can substitute safe, natural products. For example, baking soda can be used as a powdered cleanser to scrub greasy areas, pots and pans, sinks, tubs and ovens. A solution of vinegar and water can effectively clean many surfaces such as countertops.

Does the March of Dimes support research on environmental risks in pregnancy?
The March of Dimes has long supported studies seeking to identify environmental exposures that may pose a risk in pregnancy. One grantee found that a combination of genetic susceptibility with workplace exposure to the solvent benzene appeared to shorten pregnancy. This finding may eventually make it possible to identify high-risk women so that they can take steps to reduce their risk. Another grantee is hoping to provide better dietary counseling to pregnant women by studying the levels of mercury and PCBs in fish that may contribute to learning problems in children. Others are looking at how early environmental exposures may disrupt embryonic development, possibly leading to birth defects of the heart, brain and other organs.

References

Agency for Toxic Substances and Disease Registry. Public Health Statement for Arsenic. Centers for Disease Control and Prevention, updated 9/00, accessed 1/14/03.

Correa, Adolfo, et al. Ethylene Glycol Ethers and Risks of Spontaneous Abortion and Subfertility. American Journal of Epidemiology, volume 143, number 7, 1996, pages 707-