

## Environmental Risks and Pregnancy

There are more than 84,000 chemicals used in homes and businesses in this country, with little information on the effects of most of them during pregnancy (1). However, a small number of chemicals 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, also 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 reduce exposures to chemicals. However, because little is known about the effects of most chemicals on reproduction, a woman should discuss any chemical exposures in her workplace with her health care provider, preferably before pregnancy. She and her provider can determine whether additional on-the-job protections or alternative duty assignment is advisable. This is especially important for women who work in industries such as agriculture, manufacturing, dry cleaning, printing, pharmaceutical manufacturing and health care. Pregnant women also 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 metal that was found for many years in gasoline, paint and other products used in homes and businesses. Although lead is still present in the environment, the amounts have decreased greatly since the 1970s when the U.S. Environmental Protection Agency (EPA) banned its use in these products.

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 (2). Lead is harmful even after birth. Children exposed to high levels of lead may develop behavioral and learning problems, slowed growth and [hearing loss](#) (3).

Women who live in older homes may be exposed to lead in deteriorating lead-based paint. Many homes built before 1978 were painted with lead-based paint. As long as paint is not crumbling or peeling, it poses little risk. However, crumbling paint can produce lead dust when the surface is disturbed, especially when it is sanded or scraped.

Children with pica, a pattern of eating non-food substances, such as paint, clay, dirt and plaster, are at especially high risk of high blood lead levels if they dig peeling paint off walls and eat it, or chew on accessible areas, such as windowsills.

If lead-based paint needs to be removed from a home, pregnant women and children should stay out of the home until the project has been completed. Only experts should remove leaded paint, using proper precautions. For information on licensed lead-abatement contractors, visit the [EPA Web site](#).

A pregnant woman also can be exposed to significant amounts of lead in her drinking water if her home has lead pipes, lead solder on copper pipes, or brass faucets. A pregnant woman can contact her local health department or water supplier to find out how to get pipes tested for lead.

The EPA recommends running water for 15 to 30 seconds before using it for drinking or cooking to help reduce lead levels (3). Water from the cold water pipe, which contains less lead than hot water, should be used for cooking and drinking during pregnancy, and for preparing baby formula. Many home filters do not remove lead, so a pregnant woman should look for a filter that is certified by [NSF International](#) to remove lead.

Other possible sources of lead in the home include:

- Lead crystal glassware and some ceramic dishes. Pregnant women and children should avoid frequent use of these items. Commercial ceramics are generally safer than those made by craftspeople.
- Some arts and crafts materials (for example, oil paints, ceramic glazes, stained glass materials). A woman should use lead-free alternatives (such as acrylic or watercolor paints) during pregnancy and breastfeeding.
- Certain folk remedies for upset stomach, including those containing greta and azarcon.
- Vinyl mini-blinds imported from other countries.
- Lead solder in cans of food imported from other countries.
- Old painted toys.
- Cosmetics containing surma or kohl.

All people residing in the home who are exposed to lead on the job (for example, painters, plumbers and those working in smelters, auto repair shops, battery manufacturing plants or certain types of construction) should change their clothing (including shoes) 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. The Occupational Safety and Health Administration (OSHA) requires that companies provide changing facilities for lead workers. For more information, visit the [OSHA Web site](#).

#### **Does mercury exposure pose a risk in pregnancy?**

Mercury is a metal that is present in the environment. Elemental (pure) mercury and methylmercury are two forms of mercury that may pose risks in pregnancy.

Elemental mercury is used in thermometers, dental fillings and some batteries. One recent study found a slightly increased risk of miscarriage in women working with amalgam in dental offices (6). Amalgam is a silver-colored material used to fill cavities in teeth, containing elemental mercury, silver and other metals. Some countries (Sweden and Canada) recommend that dentists avoid using dental amalgam in pregnant women as a precaution, although there is no evidence that it will harm their babies (7).

Pregnant women who are concerned about the use of amalgam should discuss the use of alternative filling materials with their dentists. Women who work in industries that use mercury to manufacture products (including electrical, chemical and mining industries) should discuss their workplace exposures with their health care providers and take all recommended precautions.

Mercury enters the environment from natural sources (such as volcanic activity) and man-made sources (such as coal-burning or other industrial pollution). Mercury in the air eventually is deposited in water where it is converted by bacteria to a more dangerous form (methylmercury), which accumulates in the tissues of fish. Eating fish is the main source of methylmercury exposure in humans (4).

Trace amounts of mercury are present in many types of fish, but mercury is most concentrated in large fish that eat other fish. For this reason, the U.S. Food and Drug Administration (FDA) and the EPA advise pregnant women to avoid eating swordfish, shark, king mackerel and tilefish, and to limit consumption of albacore (white) tuna to 6 ounces or less a week (5). These fish may contain enough mercury to harm an unborn baby's developing nervous system, sometimes leading to learning disabilities. For additional guidance on eating fish during pregnancy, read [Food-borne Risks in Pregnancy](#).

### What other metals pose a risk in pregnancy?

Arsenic is another metal suspected of posing pregnancy risks. It enters the environment through natural sources (forest fires and weathering of rock) and man-made sources (mining and electronics manufacturing). Although 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 may pose an increased risk of pregnancy complications, including miscarriage and [birth defects](#).

Women who may be exposed to higher levels of arsenic include those who:

- Work at or live near metal smelters
- Live in agricultural areas where arsenic fertilizers (now banned) were used on crops
- Live near hazardous waste sites or incinerators
- Drink well water containing high levels of arsenic

This can occur in the locations described above, or in certain parts of the country with naturally high levels of arsenic in rock (including parts of New England, the Southwest, the Northwest and Alaska) (8).

Women who live in areas that may have high arsenic levels can help protect themselves from arsenic exposure by limiting their contact with soil. Women who use well water should have their water tested for arsenic to determine whether it is safe to drink or drink bottled water. For more information, visit the [EPA Web site](#). Community water suppliers already test it for arsenic.

Until 2003, arsenic was included as part of a preservative in pressure-treated lumber that was used to build decks and outdoor play sets. The EPA recommends applying a penetrating stain or sealant to these structures at least once a year to reduce exposure to arsenic (9). Anyone who works with arsenic (for example, in semiconductor manufacturing, metal smelting, or applying herbicides) should avoid bringing the metal home on clothing and shoes.

### Can pesticides harm an unborn baby?

There is little 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. Some studies suggest that high levels of exposure to pesticides may contribute to miscarriage, preterm delivery and birth defects (10). Therefore, pregnant women should avoid pesticides whenever possible.

A pregnant woman can reduce her exposure to pesticides by controlling pest problems with less toxic products. For example, she can place sticky traps in areas inaccessible to children. 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.

Pregnant women may be concerned about the safety of insect repellants during pregnancy. The insect repellant DEET (diethyltoluamide) is among the most effective at keeping insects, such

as mosquitoes and ticks, from biting. Preventing insect bites is important during pregnancy because mosquito- and tick-borne infections, such as West Nile virus and Lyme disease, may be harmful in pregnancy. Because the safety of DEET during pregnancy has not been fully assessed, a pregnant woman should apply insect repellents with DEET mainly to her clothing, and only in small amounts to exposed skin, when necessary (11). She can minimize her need for DEET by staying indoors during dawn and dusk, when mosquitoes are most likely to bite, and by wearing long pants and long sleeves.

### What are organic solvents?

Solvents are chemicals that dissolve other substances. 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 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 (12). 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 3 times more likely to miscarry than unexposed women (13). 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 clothing, 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](#).

### 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 disease-causing microbes. However, when chlorine combines with other materials in water, it forms chemical by-products, including trihalomethanes (THMs). The level of THMs and other chlorination by-products in water supplies varies, although the EPA regulates the maximum level permitted in water supplies.

A 1998 California study suggested that women who consumed more than five glasses a day of cold tap water containing high levels of trihalomethanes had an increased risk of miscarriage (14). However, a more recent North Carolina study found little or no increased risk from these chemicals (15). Scientists continue to study the safety of these chemicals during pregnancy. Until we know more, pregnant women who are concerned about chlorination by-products may choose to drink bottled water.

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

### Can air pollution harm the fetus?

Most women who live in areas with higher-than-average levels of air pollution have healthy babies. However, studies from the United States and other countries suggest that babies of pregnant women exposed to high levels of certain air pollutants (such as polycyclic aromatic hydrocarbons and small particle pollution, both of which result from vehicle exhaust and industrial sources) may be slightly more likely than babies of pregnant women living in less polluted areas to be small for their gestational age (16, 17).

Air quality in many areas of the country has improved since the first Clean Air Act was passed in 1970. However, some pregnant women, including those living in large cities, are still exposed to unhealthy levels of pollution. Individuals can help limit their exposure to pollution

by limiting outdoor activities, especially exercise, on days when air quality is expected to be poor.

#### Do household cleaning products pose a risk in pregnancy?

Although some household cleansers contain solvents, there are many safe alternatives. Pregnant women should read labels carefully and avoid products (such as some oven cleaners) with labels stating that they are toxic.

Products that contain ammonia or chlorine are unlikely to harm an unborn baby, although their odors may trigger nausea in a pregnant woman. A pregnant woman should open windows and doors and 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 household 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, such as the effects of prenatal exposure to estrogen-like chemicals in the environment. Other studies supported by the March of Dimes are seeking to improve understanding of how genes and environmental exposures may interact and contribute to birth defects.

#### For more information

Read the [fact sheets](#) provided by the Organization of Teratology Information Specialists (OTIS).

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