



PREGNANCY, THE PLACENTA, AND POLLUTION

HOW BABIES ARE EXPOSED TO POLLUTION BEFORE THEY TAKE THEIR FIRST BREATH

Babies are exposed to pollution before they take their first breath. This is jarring and upsetting—and it begs the question, how? After all, the placenta, a wondrous organ that develops in the uterus during pregnancy, is supposed to protect a growing baby from harm. It does ... and it doesn't.

What is the placenta?

It turns out that the placenta is somewhat mysterious and isn't very well understood by the medical community. We do already know substances can and do cross the placental barrier, including drugs (illegal ones, plus prescription and over-the-counter medications), nicotine, and alcohol. Some bacteria and viruses can also pass through, and while many have no effect, others, from malaria to herpes, can harm a developing baby.

Currently, the placenta is under siege by a variety of chemicals in the environment, and we're just starting to study and understand which can cross this barrier and how they impact babies. Here's a refresher on the placenta and some ideas for safeguarding growing babies during pregnancy.



The role of the placenta during pregnancy

Those of us who aren't OB/GYNs or who are new to pregnancy may not know that the placenta's main purpose is to provide oxygen and nutrients to a growing baby. It also removes waste products from the baby's blood.

In a remarkable feat of biology, it forms gradually during the first three months of pregnancy and attaches to the wall of the uterus. The umbilical cord extends from it. It's a barrier separating mom from baby too. Blood cells can't pass through—a key feature as they could be fatal if mother and child have different blood types.

The placenta is a critical organ; complications abound when it doesn't develop normally, including poor fetal growth and preeclampsia, characterized by high blood pressure.





Heavy metals and environmental contaminants cross the placenta

While the placenta's role is to protect and nurture a baby, it's not impermeable. In addition to drugs and alcohol, here are some substances known to cross the placental barrier:

Heavy metals: When pregnant people eat contaminated fish, mercury in the bloodstream damages a baby's developing brain and nervous system. No amount of exposure to mercury is safe. In the U.S., the biggest source of mercury pollution is coal-fired power plants. Harmful heavy metals like lead and cadmium can also cross the placenta.

Air pollution: Exposure to air pollution in the womb can put babies at increased risk for asthma and even high blood pressure.

Plastics: The hidden health costs of plastics are coming to light. Microplastics are one emerging field of study—pieces of plastic half a centimeter or less in length. The National Oceanic and Atmospheric Administration (NOAA) says they're harmful to ocean and aquatic life, and recently, microplastics have been found for the first time in the human placenta. Vinyl chloride can also cross the placental barrier. It's used in the manufacture of everything from PVC water pipes to food packaging and is a known carcinogen.

Per- and poly-fluoroalkyl substances (PFAS): These widespread, persistent chemicals are found in human blood worldwide. PFAS chemicals, used in everything from water- and stain-resistant fabrics to nonstick cookware, also contaminate the environment and are found in air, water, and soil. They're known to cross the placenta and have been linked to gestational diabetes, preeclampsia, and restricted fetal growth.

Endocrine-disrupting chemicals (EDCs): EDCs are natural as well as synthetic chemicals that can mimic, block, or interfere with the body's hormones. They're found in everyday products, including a variety of plastics, cosmetics, pesticides, and even toys. Exposure during pregnancy to EDCs has been associated with impaired fetal growth, thyroid dysfunction, and neurological disorders.

Environmental pollutants, pregnancy, and environmental justice

Exposure to pollution during pregnancy—typically through breathing and ingestion—increases the risk of a variety of adverse birth outcomes. Some pregnant people are more likely to be exposed to pollutants than others.

In the United States, Black women of all income and education levels are two to three times more likely to die from pregnancy-related complications than white women. They're also more likely to live near polluting facilities. In addition, heavy metals and EDCs are found at high levels in many cosmetic products specifically marketed to Black women, who purchase and use more beauty products than other consumers.



What pregnant people can do

It's not up to pregnant people alone to safeguard their growing babies. Still, there are simple steps expectant parents can take.

Just as we limit exposure to cigarettes and alcohol when pregnant, we can also make informed choices to reduce exposure to potential health harms in our diets and homes. Eating organic foods, when affordable, can minimize pesticide intake. Filtering tap water and drinking out of glass (not plastic) can also decrease contaminants. We can all purchase safer products to use in our homes. And we can be mindful of air quality before exercising outdoors, especially during wildfire season and ozone-heavy summer days.

Visit www.momscleanairforce.org to learn more and advocate for stronger protections against air pollution and toxic chemicals.

For sources, please visit:

www.momscleanairforce.org/sources-pregnancy-the-placenta-and-pollution

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