

Study finds hundreds of toxic chemicals in umbilical cords of newborns

By E. Galen
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The umbilical cord is a baby's lifeline, bringing nourishment from the mother and removing waste. The amniotic fluid bathes the growing embryo, and the umbilical cord brings the embryo oxygen, nutrients—and a startling array of toxic industrial chemicals, according to a recent study, "Body Burden: The Pollution in Newborns."

In a first-of-its-kind study, researchers from two major laboratories looked for the presence of toxic chemicals in umbilical cord blood of 10 newborn babies born in U.S. hospitals in August and September 2004. A collaboration of the Environmental Working Group and Commonweal brought about the study. (For the full report, go to <http://www.ewg.org/reports/bodyburden2/>.)

Of the more than 400 chemicals tested for, 287 were detected in umbilical cord blood. Of these, 180 cause cancer in humans or animals, 217 are toxic to the brain or nervous system, and 208 cause birth defects or abnormal development in animals. Scientists refer to the presence of such toxins in the newborn as "body burden."

According to the study's authors, the scope of testing was limited because chemical companies are not required to divulge methods for detecting the presence of their chemicals in the human body. "Had we tested for a broader array of chemicals," they wrote, "we would almost certainly have detected far more than 287."

Among those substances found to be polluting the blood supply for the newborn babies were eight perfluorochemicals used as stain and oil repellants in fast-food packaging, clothes and textiles, including the Teflon chemical PFQA, a carcinogen; dozens of widely used bromated flame retardants and their toxic byproducts; and many pesticides.

Publication of this study, despite its sensational findings, created barely a ripple in the national media. There was no outcry from the Christian fundamentalists against the poisoning of fetuses by the chemical industry, in sharp contrast to their hysteria over abortion rights. The ultra-right fanatics demonize pregnant teenagers and even the victims of rape and incest as "murderers" for terminating their pregnancies. But it is apparently an article of faith that corporate polluters should have the right to continue pumping out dangerous chemicals that damage individuals and even generations, in the name of "free enterprise."

This latest research was done to investigate the root causes of diseases caused by chemicals with in-utero origins. Certain factors contribute to children's unique susceptibility to the dangerous effect of chemicals. An immature porous blood-brain barrier in the fetus allows greater chemical exposures to the developing brain; a developing child's chemical exposures are greater pound-for-pound than those of an adult; and systems that detoxify and excrete industrial chemicals are not fully developed (National Academy of Sciences, 1993).

The difference between the effect of chemical exposure on adults and embryos can be seen in the case of mercury exposure. In Minamata, Japan, in the 1950s, poisonous mercury waste was dumped into a bay, contaminating the food chain. Autopsies of adults revealed mercury-caused lesions in a few areas of the brain, while in a fetus, lesions covered nearly the entire cortex.

Here is a summary from the report of the classes of chemical found in the babies' umbilical cord. Many of them persist for decades in the environment and in people, accumulate in the food chain and are lipophilic, that is, accumulate in fatty tissue and fluids such as breast milk.

Chemicals and pollutants found in human umbilical cord blood (Source: EWG study)	
Mercury (Hg) Tested for 1, found 1	Pollutant from coal-fired power plants, mercury-containing products, and certain industrial

	processes. Accumulates in seafood. Hurts brain development and function.
Polyaromatic hydrocarbons (PAHs) Tested for 18, found 9	Pollutants from burning gasoline and garbage. Linked to cancer. Accumulate in food chain.
Polybrominated dibenzodioxins and furans (PBDD/F) Tested for 12, found 7	Contaminants in brominated flame retardants. Pollutants and byproducts from plastic production and incineration. Accumulate in food chain. Toxic to developing endocrine (hormone) system.
Perfluorinated chemicals (PFCs) Tested for 12, found 9	Active ingredients or breakdown products of Teflon, Scotchgard, fabric and carpet protectors, food packaging. Global contaminants. Accumulate in the environment and the food chain, in meat, dairy, fish and eggs. Linked to cancer, birth defects, and more.
Polychlorinated dibenzodioxins and furans (PBCD/F) Tested for 17, found 11	Pollutants, by-products of PVC production, industrial bleaching, and incineration. Cause cancer in humans. Persist for decades in the environment. Very toxic to developing endocrine (hormone) system.
Organochlorine pesticides (OCs) Tested for 28, found 21	DDT, chlordane and other pesticides. Largely banned in the U.S. Persist for decades in the environment. Accumulate up the food chain to man. Cause cancer and numerous reproductive effects.
Polybrominated diphenyl ethers (PBDEs) Tested for 46, found 32	Flame retardant in furniture foam, computers, and televisions. Accumulates in the food chain and human tissues. Adversely affects brain development and the thyroid.
Polychlorinated naphthalenes (PCNs) Tested for 70, found 50	Wood preservatives, varnishes, machine-lubricating oils, waste incineration. Formed during chlorination of drinking water. Common PCB contaminant. Contaminate the food chain. Cause liver and kidney damage.
Polychlorinated biphenyls (PCBs) Tested for 209, found 147	Industrial insulators and lubricants. Banned in the U.S. in 1976. Persist for decades in the environment. Accumulate up the food chain; in meat, dairy and seafood. Cause cancer and nervous system problems.

Long-term effects

Chemicals that may not show harmful effects a short time after exposure may cause subtle changes in development that show up later in childhood as learning or behavior problems or in adulthood as cancers or neurodegenerative disease. Recent studies are beginning to look at how early chemical exposure can put adult health at risk. Scientists from the University of Texas found that fetal exposure to the synthetic hormone and now-banned drug DES permanently changed body tissues and raised the rate of uterine cancer in later life in laboratory animals.

Science understands and can control the spread of polio, smallpox, diphtheria and other diseases that were scourges in the past. But less clear is the cause of diseases on the increase over the last 30 years: asthma (100 percent increase 1982-1993), childhood brain cancer (40 percent increase 1973-1994), acute lymphocytic leukemia (62 percent increase 1973-1999) and autism (1,000 percent increase from early 1980s to 1996). Early life exposure to environmental toxins is certainly one suspect.

One chemical studied in the laboratory is Deca, the common name for one of three commercial fire retardants. It is added to plastics, computer monitors, TV screens, and home appliances. People absorb the chemical from food they eat and by ingesting small particles of it in their homes and worksites. When lab animals were given one single exposure to Deca, it adversely impacted learning, memory and behavior. As the animals aged, the effects grew worse. The period of greatest sensitivity to the chemical correlates to the third trimester of human pregnancy, when the brain of the fetus is rapidly growing.

One of the most sobering sections of the report examines what impact the exposure of the embryo to these hundreds of toxins will have in future generations. The researchers explain that besides genetic mutations—that is, physical changes in gene structure—there can be epigenetic changes that can silence or activate a gene (turn it permanently off or on) in a way that can be inherited. Such epigenetic changes have been linked to the fungicide vinclozolin and pesticide methoxychlor, which impaired sperm counts and sperm motility among animals in the womb and for three subsequent generations.

Lack of government regulation

Besides the fact that procedures to find chemicals in the fetus are difficult, there is another major problem in tracking the effects on people. Business has virtually free rein in its use of deadly toxins. US industries manufacture and import about 75,000 chemicals, using 3,000 of them at the rate of more than a million pounds a year. The Environmental Protection Agency (EPA), the federal government's regulatory agency, does not require that these chemicals be tested for safety before they flood the environment.

The Toxic Substances Control Act (TSCA), a federal law passed in 1976, approved as safe the 63,000 chemicals in use at the time. The law requires that the government approve new chemicals within 90 days of a company request, with companies requesting approval for about seven new chemicals a day. The law has no teeth, requiring only that the EPA negotiate with industry or complete a formal "test rule" for each individual study it wants. Needless to say, not many studies are done before chemicals are put on the market.

Even when companies agree voluntarily to test a chemical, large parts of their reports submitted to the EPA, including health and safety findings, are redacted as business secrets and can't be reviewed. In addition, the EPA takes years to review information submitted by industry.

For example, recently, research has raised concerns about the effect of Perfluorooctanoic acid (PFOA), used in the manufacture of nonstick cookware such as Teflon, and many other applications. The EPA began an extensive review of PFOA in 2003. It had to file a lawsuit over DuPont's alleged suppression of information on health studies. Most data on it has not been made available to the public. Reams of information have been given to the EPA, and it is just getting to processing these documents, as this potentially dangerous chemical continues to be massively used.

The TSCA requires that if use of a chemical is risky, top priority must be to minimize the costs to industry for any action. The act does not allow the EPA to require that the industry keep chemicals off the market as a precaution to protect public health. Rather, the chemicals have to be proven unsafe first. Since PCBs and DDT were banned in the 1970s, few chemicals have been regulated to make sure millions of people are protected from their effects.

The paltry environmental regulations that exist are being aggressively undermined by the Bush administration. Advisory committees to government agencies such as the EPA are rife with corporate executives, and polluters produce their own "scientific" studies that claim the dangerous chemicals they use are safe for the environment.