

PFAS and Children's Health Podcast Script

Narrator: Welcome to Environmental Health Chat, a podcast about how the environment affects our health, from the NIEHS Division of Extramural Research and Training. Today we'll be talking about a group of chemical compounds known as per- and polyfluoroalkyl substances, or PFAS.

You may have heard stories on the news about a group of chemicals called PFAS and about researchers and community members who are concerned about their potential effects on human health. But many people, including scientists, are still trying to fully understand what PFAS are and the effects that they have on our health.

I sat down with Joseph Braun, a professor of Epidemiology at Brown University's School of Public Health, to learn more about what PFAS are and how they affect human health.

Braun described some common sources of PFAS exposure, such as food packaging, drinking water, and stain repellents, where PFAS are used for their oil and water repellent qualities. He also explained how the nature of PFAS makes them difficult to study.

Braun: PFAS or per- and polyfluoroalkyl substances are a very large class of manmade chemicals, and there's actually thousands of these chemicals that are used in commerce or industry worldwide. And we actually don't have a really good handle on the actual number of them that are used, and we know even less about the extent of human exposure to the vast majority. In fact, most of the studies that look at exposure to these PFAS chemicals only look at a few dozen at most, so most of our knowledge is about a very limited set of these compounds.

Narrator: Braun stresses that the sheer number of PFAS compounds that exist make them difficult to study and with new ones being discovered all the time, it can be difficult to predict how they will affect human health. Another concern for scientists is that the very properties which make PFAS desirable in manufacturing, make it nearly impossible for them to break down in our environment, leading to what is called bioaccumulation.

Braun: When these chemicals get out in the environment or into our bodies they don't break down, and some of these compounds can last in the environment for years, decades, and maybe even longer in some cases for some of these compounds. The second thing is that they've been used in lots of different products and industrial processes, and so just by virtue of them being used, they get dispersed in the environment, and they can accumulate in animal tissues.

Narrator: According to Braun, when compounds build up in the environment, humans can be exposed by eating contaminated fish or other food items. Another potential source of exposure is drinking contaminated water. He says that these exposures can harm our health in a variety of ways.

Braun: In humans some of the most recognized impacts of perfluoroalkyl substances are their association with increased cholesterol levels in the blood, decreased birth weight in newborns, as well as reduced response to vaccinations in children. There's also been other studies showing that PFAS exposures during pregnancy and early childhood might be associated with neurodevelopmental deficits, so things like behavioral problems or impairments in cognitive abilities.

Narrator: Dr. Braun and his colleagues are specifically interested in how PFAS impact children's health and development. He explains that exposures early in development and childhood can have lasting impacts because children are still developing and growing.

Braun: The developing fetus, infant, and child may be more susceptible to the effects of these compounds, because at these life stages have rapidly-developing organ systems that are more sensitive to environmental inputs than those of adults. For instance, there's rapid growth, both in terms of length and in body mass, so compounds that interfere with metabolism could affect the accumulation of adipose tissue or bone formation and bone growth, and we actually suspect that these PFAS compounds can do that.

Narrator: Braun and his colleagues have been following a group of approximately 400 women and their children from the second trimester of pregnancy to the child's 12th birthday in the Health Outcomes and Measurements of the Environment or HOME study. The team is examining various health impacts of PFAS exposure at this critical window of development, such as weight gain, cardiometabolic risk, and behavior.

Braun: Our research right now is trying to determine if and when exposure to these individual PFAS as well as mixtures of them is associated with growth in the first 12 years of life, as well as body composition, which are things like muscle mass, and we're also trying to see if these PFAS chemicals are associated with cardiometabolic risk markers, like higher cholesterol, higher glucose or higher insulin levels, as well as increased blood pressure. We've also assessed children's ability to learn and remember things and their ability to plan and execute more complex tasks.

Narrator: Braun and his team have begun identifying important links between PFAS exposure and health in children. For example, they have observed associations between PFAS exposure and lowered alterations to some aspects of cognitive function, increased adiposity, and mixed results related to reading skills and attention. By shedding light on some of the potential impacts of PFAS exposure, Braun and his colleagues are able to uncover important information that can be used by decision-makers to protect health. But he stresses that more research is needed to understand how PFAS exposure may impact children's health.

He also has several suggestions how people can limit their exposure to PFAS.

Braun: So we can recommend to individuals that they eat a balanced diet and avoid consuming foods that are packaged foods whenever possible. We've also found that among children living in homes where the parents report using stain repellants, that the levels of some of these PFAS compounds are higher in their blood, and this makes sense given that we know that some of these compounds have been used in stain-repellant compounds that you put on carpeting or upholstery. And so one piece of advice we can give to parents is to not use stain-repellant chemicals in their households. In addition, individuals can install a water-filtration device in their home.

Narrator: Dr. Braun recommends granular-activated charcoal filters as the best available option to remove PFAS from drinking water. Additionally, to prevent exposure through dust particles, especially in homes with children who crawl and play on the floor, Braun suggests using a HEPA filter vacuum.

Thank you to today's guest, Dr. Joseph Braun of Brown University's School of Public Health, for sharing his expertise on PFAS and helping us to understand these compounds a little better. You can learn more about PFAS and Dr. Braun's research on our website niehs.nih.gov/podcasts.

Like what you are hearing or have suggestions to help us improve the podcast? Please take a few minutes to provide feedback by going to research.net/r/peph_podcasts.

You've been listening to Environmental Health Chat. Our podcast is brought to you by the Division of Extramural Research and Training at NIEHS, part of the National Institutes of Health, an agency of the U.S. Department of Health and Human Services.