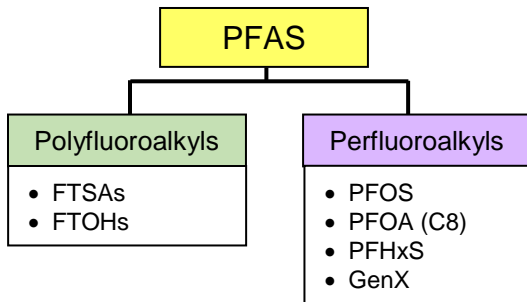


What are PFAS?

PFAS (per- and polyfluoroalkyl substances, or PFAS) are a group of man-made chemicals that are used to make household products stain-resistant, waterproof, and nonstick. PFAS used to be called PFCs, but the term "PFC" is no longer used.

PFAS are found in many products like carpet, upholstery, cookware, food packaging, and fire-fighting foam. Although many U.S. companies have stopped using certain PFAS chemicals in their products, PFAS are still commonly used in foreign products that can be imported and sold in the U.S.

There are dozens of chemicals in the PFAS family. All PFAS chemicals are either polyfluoroalkyls or perfluoroalkyls. You can use the family tree below to help you understand how some common chemicals in the PFAS family are related.



How do PFAS get into the environment?

PFAS are very common in the environment around the world. PFAS can be released into the air, water, and soil at places where they are produced or used. PFAS in the soil can leach (or seep) into groundwater (underground sources of drinking water). Once PFAS enter the environment, they will remain for a very long time and can travel long distances through the air and water.

PFAS can build up in the bodies of many different animals. PFAS have been found in the blood of mammals, fish, and birds on all seven continents.

Because there are many different chemicals in the PFAS family, scientists do not yet fully understand all of their sources (where the chemical came from) nor the pathways (how a chemical moves from one place to another).

How can PFAS get into my body?

You may be exposed to PFAS in the air, indoor dust, food, drinking water, and by using some household products.

A Centers for Disease Control and Prevention (CDC) study from 2003 – 2004 found that PFAS were present in 98 out of every 100 (98%) blood samples they studied out of thousands of samples.

Most scientists believe that swallowing contaminated food and water is the main way that PFAS enter your body. Food that was stored in packaging coated with PFAS or cooked using nonstick cookware coated with PFAS can become contaminated.

Babies and young children often put their hands and objects into their mouth. If the objects are contaminated with PFAS, it will enter their body.

Scientific studies have shown that PFAS do not absorb through the skin very easily. Bathing or showering in water contaminated with PFAS is not a main way that PFAS chemicals can enter your body.

Can PFAS cause health problems?

Scientists do not yet fully understand what health problems may be caused by PFAS. Different chemicals in the PFAS family may cause different health problems. Some, but not all studies have shown a relationship between PFAS chemicals in the body and a higher chance of some diseases.

Certain chemicals in the PFAS family, like PFOA and PFOS, have been studied more than other chemicals, so their health effects may be better understood than others.



PFAS are found in many products, like fast food cartons. (Image source: Depositphotos)

What health problems might PFAS cause?

Many, but not all studies in humans show that certain PFAS chemicals may harm developing fetuses and cause problems during childhood development. PFAS may also raise cholesterol, harm the immune system, change the body's natural hormone levels, lower fertility, and increase cancer risks.

One study of 70,000 Ohio and West Virginia residents exposed to PFOA (C8) through their drinking water found "probable links" between PFOA and several diseases. This means that drinking PFOA probably raises the chance of getting those diseases, but it is still not certain. More information about this study is available online: <http://www.c8sciencepanel.org/>

Studies on animals, like mice and rats, have shown that PFAS can cause damage to the liver and immune system. PFAS also caused birth defects in mice.

It is important to keep in mind that there may be other factors in the environment or in a person's lifestyle that caused these health problems. PFAS chemicals may not be the sole cause of a health problem.

How do PFAS affect children?

Some scientific studies have evaluated the health effects of PFAS on children. Out of more than 60 studies, many show that children exposed to chemicals in the PFAS family tend to have high cholesterol, problems with their immune system, asthma, kidney problems, and (in girls) early or late age of their first menstruation (periods).

Baby mice and rats whose mothers were exposed to very high levels of PFAS during pregnancy tended to die before they became adults or have development problems. It is important to remember that humans and rodents may react differently to PFAS, and not all health problems seen in rodents may occur in humans.

Do PFAS cause cancer?

The U.S. Environmental Protection Agency (U.S. EPA) has stated that one chemical in the PFAS family, PFOA (C8), is likely to cause cancer in humans. The U.S. EPA and other federal public health officials continue to study PFOA and other PFAS chemicals to better understand the health effects they may cause.

Is there a medical test to show if I have been exposed to PFAS?

Yes, PFAS chemicals can be measured in the blood. These tests are not common, and many doctors may not have them available because it requires special equipment.

Although a blood test can show you whether you have been exposed to PFAS, these tests cannot show whether you will get sick or where the PFAS came from.

How can I protect myself and my family from PFAS?

Because PFAS are so widespread in the environment, it is difficult to avoid all exposure to PFAS chemicals. You may be able to reduce your exposure by avoiding water that is known to be contaminated with PFAS chemicals.

You can also avoid household products that were made using chemicals in the PFAS family. Some of these products include:

- Nonstick cookware, like pots and pans.
- Furniture and carpet that is stain-resistant.
- Clothing treated with water, stain, or dirt repellent.
- Non-stick food packaging, like French fry cartons, microwave popcorn bags, and pizza boxes.
- Makeup and other personal care products that have ingredients with "fluoro" or "perfluoro" in the name.

Note: *not all non-stick coatings are PFAS-based.*

Resources

Exposure to perfluorinated alkyl substances and health outcomes in children: A systematic review of the epidemiologic literature. International Journal of Environmental Research and Public Health, July 2017.

Basic information about per- and polyfluoroalkyl substances (PFASs). 2017. U.S. Environmental Protection Agency.

Agency for Toxic Substances and Disease Registry (ATSDR). Draft toxicological profile for perfluoroalkyls. 2015. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

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