

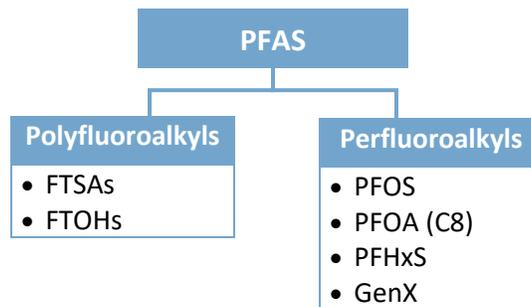
# Per- and Polyfluoroalkyl Substances (PFAS)

## What are PFAS?

Per- and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals applied to many consumer goods to make them waterproof, stain resistant, or nonstick. PFAS are also used in products like cosmetics, fast food packaging, and a type of firefighting foam called aqueous film forming foam (AFFF) which is used mainly on large spills of flammable liquids, such as jet fuel.

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. The family tree below helps explain how some common chemicals in the PFAS family are related:



PFAS used to be called perfluoro chemicals, or PFCs, but this term is no longer used.

## 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 their sources (where the chemical came from) nor their pathways (how a chemical moves from one place to another).

## How might I be exposed to PFAS?

PFAS may enter a person's body when they ingest (eat or drink) it, or if they inhale (breathe in) PFAS dust. Food cooked in cookware or packaging that contains PFAS may become contaminated, and when a person eats that food, he or she will introduce PFAS into his or her body. Home textiles like furniture upholstery, carpeting, rugs and clothing that have been treated with PFAS-based stain-resistance or waterproofing treatments can shed dust that contains PFAS chemicals, and people, especially babies and young children who tend to crawl close to the ground, may inhale the dust.

**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.**

In communities where PFAS have entered drinking water supplies, drinking water can be an additional source of exposure if it is not properly treated to remove chemicals. This includes food and baby formula prepared with contaminated water.

Scientific studies have shown that PFAS do not absorb easily through the skin. Bathing or showering in water contaminated with PFAS or simply touching an object that contains PFAS is not a main exposure route.

## Can PFAS cause health effects?

**Being exposed to PFAS does not mean you will necessarily have health effects.**

**Whether you get sick from exposure to any chemical depends on how much you were exposed to (dose), how long you were exposed for (duration), and how often you were exposed (frequency).**

There are many chemicals in the PFAS family, and they may cause different health effects if you are exposed to them. The health effects of PFOS, PFOA, PFHxS, and PFNA have been more widely studied than other chemicals in the PFAS family. Some, but not all, studies in humans with PFAS exposure have shown that certain PFAS may:

- Affect growth, learning, and behavior of infants and children;
- Lower a woman's chance of getting pregnant;
- Interfere with the body's natural hormones;
- Increase cholesterol levels;
- Affect the immune system; or
- Increase the risk of certain cancers.

Scientists are still learning about the health effects of exposures to mixtures of PFAS. For the most part, laboratory animals exposed to high doses of one or more PFAS have shown changes in liver, thyroid, and pancreatic function, as well as some changes in hormone levels. Because animals and humans process these chemicals differently, more research will help scientists fully understand how PFAS affect human health.

## How do PFAS affect children?

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

Unborn babies may be exposed to PFAS through their umbilical cord if their mother ingests PFAS while she is pregnant, and babies may be exposed through breastmilk. Research suggests that fetuses are more at risk of having health effects from PFAS exposure.

## 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. However, 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.

**Always talk with your doctor or primary care provider if you are concerned about your health or have medical questions.**

## How can I reduce my PFAS exposure?

PFAS may be present in drinking water, food and many consumer products. While avoiding all exposures to all sources of PFAS may not be feasible due to the wide use of PFAS in many consumer products, following the recommendations below can help a person reduce their exposure greatly:

- If PFAS are in your drinking water, either treat the water or use an alternative source (such as bottled water).
- Be an informed consumer and research whether manufacturers are using PFAS in the household products you buy, especially anything labeled waterproof, non-stick and stain-resistant. Certain brands of stain-resistant carpeting and upholstery, stain-resistant or waterproof clothing, fast food packaging like pizza boxes and microwave popcorn bags, non-stick cookware and some cosmetics and personal care products are known to contain PFAS.
- To keep PFAS dust out of your home and body, clean your house and dust surfaces regularly.

## For More Information

For more information on PFAS, including the health effects of PFAS, PFAS in drinking water, water testing and treatment, and other PFAS activities in Ohio, visit the Ohio PFAS webpage at [pfas.ohio.gov](https://pfas.ohio.gov).

For more information on PFAS and your health, contact the ODH Health Assessment Section at [BEH@odh.ohio.gov](mailto:BEH@odh.ohio.gov) or at (614) 728-9452.