

# Perfluoroalkyls - ToxFAQs™

## What are perfluoroalkyls (PFAs)?

Perfluoroalkyls (PFAs) are a group of man-made chemicals that are not found naturally in the environment. Some chemicals that are in this group PFAs include:

- perfluorooctanoic acid (PFOA)
- perfluorooctane sulfonic acid (PFOS)
- perfluorononanoic acid (PFNA)
- perfluorohexane sulfonic acid (PFHxS)
- perfluorodecanoic acid (PFDeA)

These PFAs were used to protect products like carpet and fabric, and as a coating for paper and cardboard packaging. They can also be found in some fire-fighting foams.

- The two PFAs made in the largest amounts in the United States were PFOA and PFOS. However, most companies have stopped making these two chemicals.

## Where are PFAs found in the environment?

- PFAs can be found in air, soil, and water.
- They break down very slowly in air within days or weeks, but then fall to the ground where they can enter water or soil.
- PFAs do not break down in water or soil and may be carried over great distances by wind or rain.

## How can I be exposed to PFAs?

- You may be exposed to PFAs in the air; in indoor dust, food, and water; and in some home products. However, the main sources of exposure to PFAs, such as PFOA and PFOS, are usually from eating food and drinking water that has these chemicals.
- Breast feeding infants may be exposed to PFAs since these chemicals have been found in breast milk. The benefits of breastfeeding are well known and almost always outweigh any potential risk, but you can talk with your doctor about concerns.

- Children can be exposed to PFAs in carpet since they are closer to the ground and play on the floor.
- Workers in facilities that make or use PFAs can be exposed to higher amounts of these chemicals and have higher levels in their blood.
- Some communities near factories that made or used PFOA and PFOS or in areas that used certain types of firefighting foam that spread into the environment may have been exposed to high levels of these substances in their drinking water.

## How can PFAs affect my health?

A large number of studies have examined possible relationships between levels of PFAs in blood and harmful health effects in people. However, most of these studies analyzed only a small number of chemicals, and not all PFAs have the same health effects. Research suggests that high levels of certain PFAs **may**:

- increase cholesterol levels;
- decrease how well the body responds to vaccines;
- increase the risk of thyroid disease;
- decrease fertility in women;
- increase the risk of serious conditions like high blood pressure or pre-eclampsia in pregnant women;
- lower infant birth weights; however, the decrease in birth weight is small and may not affect the infant's health.

At this time, scientists are still learning about the health effects of exposures to mixtures of PFAs.

One way to learn about whether PFAs will harm people is to conduct studies in lab animals. Most of these studies have tested doses of PFOA and PFOS that are higher than levels found in the environment.

- These animal studies have found that PFOA and PFOS can cause damage to the liver and the immune system.
- PFOA and PFOS have also caused birth defects, delayed development, and newborn deaths in lab animals.

Humans and animals react differently to PFAs, and not all effects observed in animals may occur in humans.

- Scientists have ways to estimate how the exposure and effects in animals compare to what they would be in humans.
- What they learn from this process helps them decide how to protect people from harm caused by chemical exposure.

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## Can PFAs cause cancer?

Studies do not clearly show whether PFAs cause cancer in people. People exposed to high levels may have increased risk of kidney cancer or testicular cancer. However, these studies are not consistent and may not have looked at other factors like smoking.

Studies in animals have shown that PFOA and PFOS can cause cancer in the liver, testes, pancreas, and thyroid. However, some scientists believe that humans may not develop the same cancers as animals.

The International Agency for Research on Cancer has classified PFOA as possibly carcinogenic (causing cancer) to humans, but it has not evaluated whether other PFAs may also cause cancer. The Department of Health and Human Services has not yet evaluated whether PFOA and other PFAs can cause cancer. The Environmental Protection (EPA) suggest that there is evidence that PFAs may have the potential to cause cancer.

## How can I protect my family from exposure to PFAs?

- If you do not know about PFAs levels in your water, ask your local health department.
- If your drinking water contains PFAs above the EPA Lifetime Health Advisory, consider using an alternative or treated water source for any activity in which you might swallow water. Check for fish advisories for water bodies where you fish. Follow fish advisories that tell people to stop or limit eating fish from waters contaminated with PFAs or other compounds.

## Can a medical test show whether I've been exposed to PFAs?

A blood test can measure individual PFAs compounds in your blood, but this is not a test routinely done in a doctor's office.

If you have PFAs in your blood, you have been exposed to these chemicals and absorbed them into your body at some time. However, having PFAs in your blood does not necessarily mean that you will become ill from PFAs.

## Has the federal government made recommendations to protect human health?

The EPA has set drinking water levels for PFOA and PFOS of 70 parts per trillion. You can learn more by visiting: <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>.

## Where can I get more information?

For more information, call CDC-INFO at 1-800-232-4636.

You can also get information on ATSDR's PFAS website: <https://www.atsdr.cdc.gov/pfas/index.html>.

You can also contact your community or state health or environmental quality department if you have any more questions or concerns.