PFAS Per- and Polyfluoroalkyl General Health Information

PFAS (per- and polyfluoroalkyl substances) are a group of manufactured chemicals that can be found in air, soil, and both ground, and surface waters. Studies about health effects of PFAS exposure in humans and animals have not reached clear conclusions. However, results do suggest that certain PFAS may be related to specific health problems. Once released, they are very persistent in the environment and the human body.

PFAS has been used in industry and consumer products worldwide since 1940s for production of:

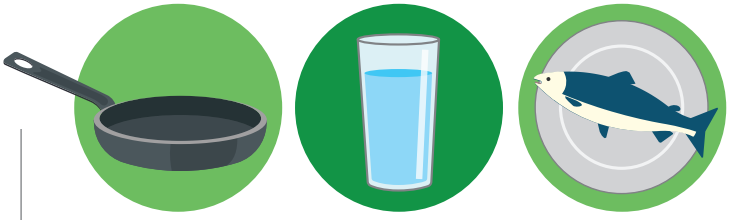
- Surface protection of non-stick cookware
- Stain resistant carpets and fabrics
- Waterproof mattresses and clothing
- Grease-resistant food packaging
- Some firefighting materials
- Photo imaging, metal plating, printers, and copy machines

The most common and well-studied PFAS are perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). Followed by perfluorohexane sulfonic acid (PFHxS), perfluorononanoic acid (PFNA), hexafluoropropylene oxide dimer acid (HFPO-DA), also known as GenX, and perfluorobutane sulfonate (PFBS).

Exposure to PFAS

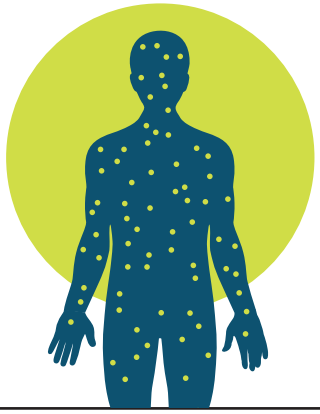
You can be exposed to PFAS by:

- Drinking PFAS contaminated water.
- Eating foods produced near places where PFAS were used or made.
- Eating fish caught from PFAS contaminated water.
- Eating foods packaged in material that contain PFAS (e.g., popcorn bags).
- Swallowing or breathing in PFAS contaminated soil or dust.
- Accidentally swallowing residue or dust from consumer products containing PFAS such as stain resistant carpeting and water repellent clothing.



Research has suggested that exposure from today's consumer products is usually low. For most, exposure from showering, bathing, or washing dishes in water containing PFAS would also be low, especially when compared to exposures to contaminated drinking water. For infants and toddlers, hand-to-mouth is considered the most significant source of exposure.

Health Impacts of PFAS



Some animal and human studies find positive associations between PFAS exposure and a wide range of health effects. However, results of animal studies do not always correlate with human health effects.

Possible non-cancer effects may include:

- Increased cholesterol levels
- Lower antibody response to some immunizations
- Reduced ability of the body's immune system to fight infections
- Changes in liver enzymes
- Hypertension and preeclampsia in pregnant women
- Small decrease in birth weight
- Decreased fertility

PFAS and Cancer

The U.S. Environmental Protection Agency (EPA) has determined there is suggestive evidence that PFOA and PFOS may cause cancer but has not officially classified either as carcinogens. The suggestive evidence from animal studies is not sufficient to assess human carcinogenic potential. The International Agency for Research on Cancer has classified PFOA as carcinogenic to humans and PFOS as possibly carcinogenic to humans.

Some animal studies have suggested a higher risk of certain cancers, such as kidney or testicular cancer. It has been suggested that some PFAS could contribute to the development of breast cancer, though the epidemiologic evidence remains limited and inconclusive.

Some increases in kidney, prostate, and testicular cancers have been seen in individuals exposed to higher PFAS levels. Most of these exposures were in people who worked or lived near PFAS manufacturing facilities.

Reduce PFAS Exposure

Almost everyone has been exposed to PFAS from the environment or using products that contain PFAS. It is impossible to avoid all exposure to PFAS. However, most exposures occur from eating or drinking food or water with PFAS.

Reduce or limit your contact when you can, prioritizing your PFAS exposure from drinking water and food:

- Filter your drinking water, especially if you get your water from a well.
- Reduce or limit the amount of fast food, microwave popcorn, and takeout you eat. Some single-use containers and food packaging contain PFAS.
- Reduce or limit your use of non-stick cookware. Stainless steel, cast iron, or porcelain cookware products are good PFAS-free alternatives. Cookware that is labeled as PFOA-free and PFOS-free does not always mean it is free from all PFAS chemicals.
- Avoid swallowing water from lakes, streams, and rivers that may contain PFAS. This includes your pets.
- Choose products that are not labeled stain or water resistant, and avoid applying these treatments to items.
- Check product labels for ingredients that include the words “fluoro” and “perfluoro” and avoid their use.

Blood Testing for PFAS Levels

Most people in the U.S. have measurable amounts of PFAS in their body because these chemicals are commonly used in commercial and industrial products.

It is not clear how PFAS in blood impacts human health. Having PFAS in your blood does not necessarily mean that you will become ill from PFAS. Any decision on testing should be discussed with your health care provider.

- PFAS is not a routine clinical test, so your doctor would need to contact a private laboratory directly to arrange for the test. It is unlikely that your health insurance will cover the cost.

Most people in the United States have been exposed to PFAS and have PFAS in their blood. Since 2002, the production and use of PFOS and PFOA in the United States has declined. As the use of some PFAS have declined, some blood PFAS levels have gone down as well. National Health and Nutrition Examination Survey reports:

- From 1999-2000 to 2017-2018, blood PFOS levels declined by more than 85%.
- From 1999-2000 to 2017-2018, blood PFOA levels declined by more than 70%.

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